CUMULATIVE EFFECTS ANALYSIS CHAPTER 9

The cumulative effects analysis (CEA) examines the consequences of the regulatory alternatives within the context of past, present, and future factors that influence resources associated with the ALWTRP. The discussion below is organized according to the following topics:

- the requirements that necessitate a CEA, which are presented in Section 9.1;
- an introduction to the valued ecosystem components (VECs) considered in this analysis, which is located in Section 9.2;
- a description of the geographic and temporal scope of the analysis, which is presented in Section 9.3;
- a discussion of the past, present, and reasonably foreseeable future actions that interact with each VEC, which is presented in Section 9.4;
- a summary of the biological, economic, and social consequences of the regulatory alternatives, which is in Section 9.5; and
- a detailed analysis of the cumulative effects of the regulatory alternatives on each VEC within the context of other past, present, and reasonably foreseeable future actions, which is in Section 9.6.

9. 1 BACKGROUND

NEPA requires all environmental impact statements for proposed Federal actions to include a cumulative effects analysis that examines the impact of the actions in conjunction with other factors that affect the physical, biological, and socioeconomic resource components of the affected environment. Guidelines for evaluating cumulative effects, prepared by the Council on Environmental Quality (CEQ), emphasize the growing evidence that "the most devastating environmental effects may result not from the direct effect of a particular action, but from the combination of individually minor effects of multiple actions over time" (CEQ, 1997). The

purpose of the cumulative effects analysis is to ensure that Federal decisions consider the full range of an action's consequences, incorporating this information into the planning process.

9.2 VALUED ECOSYSTEM COMPONENTS

The following VECs would be affected by changes to the ALWTRP and are addressed in this analysis:

- **Atlantic Large Whales**. This VEC includes the three large whale species that are the focus of the ALWTRP — the North Atlantic right whale, the humpback whale, and the fin whale — as well as the minke whale, which also benefits from the plan. The Affected Environment chapter of this EIS provides a detailed discussion of the life cycle and abundance of these species.

- **Other Protected Species**. Other protected species include other whales, dolphins, porpoises, seals, and turtle species that may interact with gillnet and/or trap/pot fishing gear and are classified as (1) endangered or threatened under the Endangered Species Act, or (2) otherwise protected under the Marine Mammal Protection Act. The Affected Environment chapter of this EIS provides an overview of the life cycle and abundance of these species.

- **Affected Fisheries**. The affected fisheries are all those currently or potentially subject to the requirements of the ALWTRP:

  - The lobster trap/pot fishery, including all vessels holding state or Federal limited access lobster permits.

  - The gillnet fishery, including all vessels with state or Federal limited access or general category permits using gillnet fishing gear. This includes but is not limited to the following gillnet fisheries: multispecies, monkfish, spiny dogfish, shark, and the coastal migratory pelagic fisheries.

  - The other trap/pot fishery, including all vessels with state or Federal limited access or general category permits using trap/pot fishing gear. This includes but is not limited to the following trap/pot fisheries: black sea bass, conch/whelk, hagfish, Jonah crab, red crab, and scup.

  The Affected Environment chapter provides a detailed discussion of these fisheries.

- **Habitat**. The habitat VEC includes all marine habitats deemed essential and/or critical to the well-being and reproduction of commercial marine species and endangered species. For the purpose of this action, Essential Fish Habitat (EFH) includes all water column and benthic habitat of the EEZ. EFH is described in greater detail in the Affected Environment chapter. Critical habitat areas are designated under the Endangered Species Act for endangered or threatened marine species.

- **Fishing Dependent Communities**. This VEC includes all coastal communities whose economies and social structure are substantially dependent on or affected by lobster, other trap/pot, and/or gillnet fishing activities and income.

9.3 GEOGRAPHIC AND TEMPORAL SCOPE

This analysis is limited to the geographical area currently or potentially subject to the requirements of the ALWTRP. This area includes the seawater and seabottom of the Atlantic Ocean within U.S. jurisdiction from Maine to West Palm Beach, Florida.

The temporal scope of the analysis varies by resource. In all instances, the analysis attempts to take into account both present and reasonably foreseeable future actions that could affect valuable physical, biological, or socioeconomic resources. The discussion of past actions and events, however, reflects underlying differences in the availability of historical information, as well as differences in the period of time that must be considered to provide adequate context for an understanding of current circumstances.

- **Atlantic Large Whales**. The assessment of factors that have influenced the status of large whales employs a broad time horizon, reflecting the long history of commercial whaling and its critical role in the depletion of whale stocks. This history dates to as early as 800 A.D. The discussion notes the continuing impacts of whaling on the status of whales today, but also provides information on a variety of other stresses, including interactions with commercial and recreational fisheries, ship strikes, water pollution, noise pollution, climate change, and prey availability. The discussion of these issues focuses primarily on information gathered over the last two decades, and in particular on information characterizing conditions since 1994, when Congress amended the Marine Mammal Protection Act to require the preparation of annual stock assessments for all populations of marine mammals in U.S. waters.

- **Other Protected Species**. The analysis of impacts on other protected species (i.e., whales, porpoises, dolphins, sea turtles, and seals) considers information on populations and large take incidents dating as far back as the 1940s, but again focuses primarily on the last two decades. As with large whales, regular efforts to collect information on porpoise, dolphin,

and seal species did not begin until 1994, when amendments to the MMPA mandated preparation of annual stock assessments. For sea turtles, recovery plans were completed in the early 1990s; however, the collection of more detailed information did not begin until the mid-1990s, with the establishment of the Turtle Expert Working Group.

- **Habitat**. The analysis of impacts on marine habitat relies primarily on information generated since the 1996 passage of the Sustainable Fisheries Act (SFA). Prior to 1996, marine habitat was directly and indirectly protected through a series of environmental regulations passed in the 1970s to 1990s. The SFA, however, represented the first Federal recognition of the importance of habitat protection for maintaining healthy fisheries, and resulted in a number of new regulations and requirements that applied a more rigorous and structured habitat protection approach. The systematic studies conducted to support the development of these regulations provide the necessary context for evaluating the impact of ALWTRP regulations.

- **Affected Fisheries and Fishing Dependent Communities**. The analysis of impacts on affected fisheries and fishing dependent communities is based in large part on information gathered in the development of Fishery Management Plans (FMPs). These plans are developed under the provisions of the Magnuson-Stevens Act (MSA) and in some cases have been in place for several decades. In other cases, however, FMPs are relatively new or have yet to be implemented. In these instances, the historical analysis is generally limited to information on fishing activity and/or management actions within the last decade.

9.4 EFFECTS OF PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

The following sections consider the direct, indirect, and cumulative effects of past, present, and reasonably foreseeable future actions on each of the previously defined valued ecosystem components. The effects described below would occur without implementing any of the proposed modifications to the ALWTRP. The effects of past, present, and reasonably foreseeable future actions essentially describe the No Action Alternative (Alternative 1) in that the existing and future conditions are characterized relative to their present effects on the VECs.

9.4.1 Atlantic Large Whales

The status of large whales in the Atlantic has been and continues to be affected by numerous factors. Historically, commercial whaling has presented the greatest threat to whale stocks, and is largely responsible for reducing the population of certain species to endangered status. Broad adherence to a voluntary international ban on commercial whaling has greatly reduced or eliminated this threat to the most seriously endangered species. Other threats, however, remain, the most documented of which include collisions between whales and ships and entanglements in fishing gear. Additional factors that may adversely affect Atlantic large whale stocks include water pollution, noise pollution, climate change, and prey availability. Less is known, however, about the actual impact of these threats on whale stocks. The following discussion describes the known or potential impact of these factors and provides a summary of past, present, and reasonably foreseeable future management actions taken to address the threat, if any.

9.4.1.1 Commercial Whaling

Impacts

Commercial whaling may have started as early as 800 A.D. in Scandinavia, and is known to have been practiced by the Basques off the coast of France and Spain as early as the 12th century. The practice spread to the Netherlands and Britain by the 16th century, and to the Americas by the 17th century. Early whaling, utilizing hand-held harpoons, targeted slow-swimming species like right whales and bowhead whales. With the development of steam driven vessels and, in 1868, the invention of the explosive harpoon gun, the age of modern whaling began. These innovations in whaling technology allowed whalers to target faster swimming species such as blue, fin, and sei whales.

The International Whaling Commission (IWC) was established in 1946 to regulate whaling and thus ensure the sustainability of the whaling industry (Cooke, 1995; Holt, 1999). The IWC originally negotiated whaling quotas with member nations based on estimates of whale populations. These quotas were set too high, however, and the system eventually proved incapable of preventing overexploitation (Gambell, 1999).[1] By the early 1980s, the organization had shifted its focus from whaling regulation to whale conservation. The result was the 1982 approval of a ban on commercial whaling, which came into effect in 1986 and remains in effect to this day. As a result of this ban, most IWC members have ceased whaling entirely; only Denmark, Iceland, and Norway continue any form of whaling in the North Atlantic, and the number of whales taken by these nations has been greatly reduced.

The following discussion examines the history and current impacts of whaling on right, humpback, fin, and minke whales.

[1] Membership in the IWC is voluntary; its resolutions are not binding, and its regulations are not binding on any nation that lodges formal objection to them.

Right Whales

North Atlantic right whales were the first target of commercial whaling and, consequently, the first large whale species to be hunted to near extinction by such efforts. Whalers targeted this species for several reasons, including the presence of right whales in near coastal waters, the relatively slow speed at which they swim, their tendency to float when dead, and the high yield of commercially valuable products (e.g., oil and baleen) they provided. These factors also contributed to the whale's common name, which is said to have originated from the English whalers who designated this species of whale as the "right" (i.e., correct) whale to hunt. More than 800 years of uncontrolled and intense commercial whaling is the primary reason that the population of right whales has declined to its present-day critical level.

Commercial whaling of right whales in substantial numbers began in the 1500s with Basque whalers in the Strait of Belle Isle region off Newfoundland (Aguilar, 1986). As the stocks in these waters became depleted, hunting efforts shifted to the Labrador and New England coasts. In total, between the 11th and 17th centuries, an estimated 25,000 to 40,000 North Atlantic right whales are believed to have been taken. This intense period of early whaling may have resulted in a significant reduction in the stock of right whales by the time colonists in the Plymouth area began hunting them in the 1600s. Nonetheless, a modest but persistent whaling effort along the coast of what is now the eastern United States continued. One record from January 1700, for example, reports 29 right whales killed in Cape Cod Bay in a single day (Reeves, 1987).

The League of Nations adopted a resolution banning all whaling of right whales in 1935.[2] At that time, it is thought that fewer than 100 right whales survived in the western Atlantic (NMFS, 2001a).

Humpback Whales

Throughout their range, humpback whales were heavily exploited by commercial whalers until the middle of the 20th century. Prior to the onset of commercial whaling, the worldwide population of humpback whales is thought to have been in excess of 125,000. American whalers alone killed 14,000 to 18,000 humpbacks between 1805 and 1909 (Best, 1987) and the total North Pacific kill was estimated to be about 28,000 (Rice, 1978). Today perhaps no more than 10,000 to 12,000 exist (Braham, 1984), about ten percent of the estimated initial number.

Commercial hunting of humpbacks ceased in the North Atlantic in 1955 and in all other ocean waters in 1966. Since then, humpback whales have only been taken at three locations: off eastern Canada, where, from 1969 to 1971, 41 humpbacks were taken under a scientific permit; off western Greenland, where, until 1980, aboriginal subsistence hunters were permitted to take up to 10 humpbacks per year; and at Bequia Island in the Lesser Antilles of St. Vincent and the Grenadines, where subsistence hunters are permitted to take up to twenty humpbacks from 2003 through 2007. From 1996 to 2001, the actual take at this last location averaged two per year (IWC, 2003).

[2] The International Whaling Commission banned all whaling of right whales in 1949.

Fin Whales

Wide-scale hunting of fin whales, which tend to be found farther offshore than right whales or humpback whales, did not occur until the introduction of steam-powered vessels and harpoon gun technology and continued well into the 20th century. Commercial whaling for this species ended in the North Pacific in 1976 and the North Atlantic in 1987. Since 1987, the only area in the Northern Hemisphere where fin whales have been hunted with the authorization of the IWC is Greenland.[3] There, a take of 19 fin whales over five years (2003-2007) is permitted under the IWC's "aboriginal subsistence whaling" scheme (IWC, 2002). Meat and other products from whales killed in this hunt are marketed within Greenland, but export is illegal. Between 1997 and 2002, Greenland took, on average, ten fin whales per year (IWC, 2003).

Minke Whales

Hunting of minke whales did not commence until well into this century as larger whales became fewer in number and gained protected status. Hunting of minke whales was initially confined to small fishing boats in the nearshore waters of Norway and Iceland. After World War II, Norwegian minke whaling expanded to the west. In addition, local whaling commenced off the coasts of Canada and Greenland, and Japanese whalers began to target minke whales in the North Pacific and Antarctic.[4] Under an official objection to the IWC moratorium on commercial whaling, Norway continues to hunt minke whales in the North Atlantic region. Greenland has also been active, taking a small number of minkes each year under the IWC's "aboriginal subsistence whaling" scheme. In addition, in 2003, Iceland announced its intention to take 38 minke whales from its coastal waters before the end of the year, and a total of 200 minke whales over two years for scientific research (Icelandic Ministry of Fisheries, 2003; Alvarez, 2003).

Exhibit 9-1 shows the catch history for minke whales by IWC member nations in the North Atlantic and worldwide from 2002 to 2004. These figures demonstrate that minke whales continue to be hunted in significant numbers, both in the North Atlantic and worldwide.

[3] Within the last two decades, Iceland and Spain have hunted fin whales. Iceland last reported a catch in the 1989-90 season, when it took 68 fin whales; Spain last reported a catch for the 1984-85 season, taking 48 fin whales.

[4] Over the past ten years, Japan has taken hundreds of North Pacific and Antarctic minke whales under a provision of the Whaling Convention that permits countries to take whales for scientific research.

Exhibit 9-1

CATCH[1] HISTORY OF MINKE WHALES BY IWC MEMBER NATIONS IN THE NORTH ATLANTIC & WORLDWIDE, 2002 THROUGH 2004

	2002	2003	2004
Denmark (Greenland)[2]	149	199	190
Norway[3]	634	647	544
North Atlantic Total	783	883	759
Worldwide Total	1,374	1,482	1,368

Notes:
1 Catch refers to total whales struck, not total landed.
2 Greenland takes of minke whales fall under an aboriginal-subsistence whaling permit from the IWC. Includes whales struck by West and East Greenland.
3 Commercial operation based on official objection to the IWC moratorium.

Source: IWC, 2003; 2004; 2005.

9.4.1.2 Entanglement

As discussed in the Purpose and Need chapter, fishing gear entanglements are one of the primary sources of serious injury and mortality among Atlantic large whales. The following section summarizes the risk to Atlantic large whales from entanglement in commercial and recreational fishing gear.

Entanglements in Commercial Fishing Gear

Fishermen typically leave fishing gear such as gillnets and traps/pots in the water for a discrete period, after which time the nets/traps/pots are hauled and their catch retrieved. While the gear is in the water, whales may become accidentally entangled in the lines and nets.

Whales have been observed swimming with portions of line (with or without the fishing gear) wrapped around the pectoral fin, the fluke stock, the neck, or the mouth. Documented cases have indicated that entangled animals may travel for extended periods of time and over long distances before freeing themselves or dying as a result of the entanglement (Angliss and Demaster, 1998). Younger animals are particularly at risk if the entangling gear is tightly wrapped, since the gear will become more constricting as the animals grow. The majority of large cetaceans that become entangled are juveniles (Angliss and Demaster, 1998).

The effects of entanglement can range from no permanent injury to death. The analysis of entanglement data presented in Chapter 2 noted the following with respect to recent data on interactions between fishing gear and Atlantic large whales:

- Entanglements that caused serious injury most frequently involved humpback whales, followed by right whales, then minke and fin whales.

- Fatal entanglements most frequently involved minke whales, followed by humpback whales, right whales, and fin whales.

- Fatal entanglements were most frequently reported off the coast of Massachusetts. Additional fatal entanglements were reported off the coasts of North Carolina, Virginia, South Carolina, and Maine.[5]

Exhibit 9-2 presents a summary of total annual mortality, annual mortality from fishing gear interactions, and the potential biological removal (PBR) level for each of the four Atlantic large whale species. These data demonstrate that the current rate of mortality from fishing gear entanglements exceeds PBR levels for right and humpback whales.

Exhibit 9-2

TOTAL ANNUAL MORTALITY, ANNUAL FISHING MORTALITY AND POTENTIAL BIOLOGICAL REMOVAL (PBR) LEVELS FOR RIGHT, HUMPBACK, FIN, AND MINKE WHALES

	Right Whale	**Humpback Whale**	**Fin Whale**	**Minke Whale[3]**
Total Annual Mortality[1]	2.6	5.2	1.2	n.a.
Total Annual Mortality, U.S. Waters Only	1.8	4.4	1.2	3.2
Annual Fishing Mortality, U.S. Waters Only[2]	1.0	3.2	0.2	3.2
PBR	0.0	1.3	4.7	31

Notes:

1 Total Annual Mortality refers to mortality and serious injury resulting from large whale interactions with commercial fisheries and ship strikes, both in U.S. and Canadian waters.

2 Annual Fishing Mortality refers to mortality and serious injury resulting from large whale interactions with commercial fisheries.

3 Estimates for minke whales derived from stranding and entanglement data between 1999 and 2003 refer to U.S. waters only.

Source: Waring et al., 2006.

Efforts to Reduce and Track Large Whale Entanglements

In 1996, the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed to address the interaction of western North Atlantic stocks of right and humpback whales, among other species, with the Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish.[6] A draft plan to reduce takes

[5] The location where a whale is first observed and reported as entangled is not necessarily the location where the whale initially became entangled. Sightings data can be influenced by many factors, including the amount of time and area covered by the observer program and/or whether the whales are known to congregate in observed areas.

[6] Other cetacean species considered by the AOCTRT include Western North Atlantic stocks of sperm and pilot whales; and common, bottlenose, and spotted (Atlantic and pantropical) dolphins.

resulting from these types of gear was submitted, but an Atlantic Offshore Cetacean Take Reduction Plan was not finalized as a separate entity. Instead, several protective measures were implemented for these fisheries through the HMS FMP. In particular, NMFS prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented several other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries.

In response to the growing number of serious injuries and mortalities to the North Atlantic right whale from other fisheries, NMFS in 1996 established a take reduction team (TRT) to help develop a plan to reduce interactions between Atlantic large whales and fishing gear. In 1997, with the help of the TRT, NMFS published an interim final rule to reduce the number and severity of fishing gear entanglements with Atlantic large whales. The 1997 plan had two goals:

(1) Reduce serious injuries and mortalities of right whales in U.S. commercial fisheries to less than 0.4 animals per year by January 1998.

(2) Reduce by April 30, 2001, entanglement-related serious injuries and mortalities of right, humpback, fin, and minke whales to insignificant levels approaching a zero mortality and serious injury rate.

To reduce the incidental take of Atlantic large whales, the 1997 regulations focused primarily on the implementation of area closures for lobster trap/pot and gillnet fishermen, and modifications of lobster trap/pot and gillnet fishing gear.

In addition to measures that directly affect fishing, the plan also supported several supplementary initiatives intended to decrease entanglements over the long term:

- **Gear Research and Development**: The gear research and development program works to reduce the number of lines in the water without shutting down fishery operations. For example, the program works to devise lines that are weak enough to allow whales to break free and, at the same time, strong enough to allow continued fishing.

- **Disentanglement Network**: The disentanglement network is an effort to locate and assess entangled whales, and to remove entangling gear when it is determined to be life threatening. NMFS contracts with the Provincetown Center for Coastal Studies to train volunteers and conduct disentanglements from Maine to Florida.

- **Right Whale Sighting Advisory System (SAS)**: The SAS, founded in 1996 as the "Early Warning System," is a multi-institutional effort to locate right whales and to make mariners aware of their presence.

Canada is also taking a closer look at interactions between North Atlantic right whales and Canadian commercial fisheries. In 2000, the Department of Fisheries and Oceans, in cooperation with the World Wildlife Fund Canada, developed Canada's first Right Whale Recovery Plan and recovery implementation team. The recovery plan, which is intended as a

"blueprint" for action, includes a number of recommendations related to gear entanglement, whale research, and regulatory and enforcement actions.

Entanglements in Recreational Fishing Gear

Large whale entanglements may also result from interactions with recreational fishing gear, but data on recreational fishing of trap/pot and gillnet fishing gear are relatively sparse. Finfish recreational fisheries typically use rod and reel and hand lines instead of gillnets or fish pots. Recreational lobster fishing with traps/pots, however, is common, especially in state waters.[7] In 2002, the state of Massachusetts issued 11,950 recreational lobster licenses, with 6,271 (or 52.5 percent) of these license holders reporting that they fished for lobster (Dean et al., 2004). Common fishing methods included the use of traps/pots and diving for lobsters. The number of traps fished recreationally decreased by 4.8 percent from 2001 (26,299 traps in 2002). Massachusetts recreational lobster landings totaled 219,801 lobsters (calculated to be about 279,147 pounds), about two percent of commercial landings in that year. Although many other Atlantic states also allow for a recreational lobster fishery, additional data on the extent of the recreational fishery in other states are not readily available.

Recreational use of trap/pot and gillnet gear is not governed by the ALWTRP. Therefore, while the risk of entanglement in recreational gear may be relatively small, modification of the ALWTRP will not influence recreational fisheries at this time.[8]

9.4.1.3 Ship Strikes

Impacts

Ship strikes – collisions between whales and ships – also pose a significant risk to whales. Exhibit 9-3 provides an estimate of average annual mortality from ship strikes for right, humpback, fin, and minke whales, based on reports from 1996 through 2001. As the exhibit indicates, the reported mortality rate for minke whales is less than 0.20 per year. In contrast, the mortality rate for larger whales is higher, ranging from 1.00 for right whales to 1.50 for fin whales. Given the depleted nature of these stocks, this represents a potentially significant source of risk. For the endangered North Atlantic right whale during the period 1997 through 2001 (Waring et al., 2003), the total estimated shipstrike mortality and serious injury was estimated at 0.8 per year (USA waters 0.6; Canadian waters, 0.2). Between the years 1999 and 2003, the average reported mortality and serious injury to right whales due to ship strikes was 1.0 whale per year (U.S waters, 0.8; Canadian waters, 0.2) (Waring et al., 2006). At this time, both ship strikes and gear interactions remain a concern for the continued existence of right whales. As with all estimates of mortality presented here, it is likely that these numbers underestimate the true mortality due to ship strikes.

[7] Some states also allow recreational gillnet fishing.

[8] NMFS does, however, conduct outreach to recreational fishermen; for more information, see Marine Mammal and Sea Turtle Protection: Guidelines for Recreational Fishermen.

Exhibit 9-3

AVERAGE ANNUAL MORTALITIES FROM SHIP STRIKES, 1996 THROUGH 2001

Right Whales	Humpback Whales	Fin Whales	Minke Whales
1.00	1.17	1.50	0.17

Source: Analysis of data from Laist et al., 2001, and Jensen and Silber, 2004.

Fatal ship strikes of large whales first occurred in significant numbers during the 1950s to 1970s, as the number and speed of ships increased. A review of 58 known vessel collisions by Laist et al. (2001) revealed that while all sizes and types of vessels can hit and injure whales, the most severe injuries result from collisions involving ships that are greater than 80 meters in length or travelling at speeds exceeding 13 knots.[9] The risk of such strikes is high near the Northeast seaboard's busiest ports and shipping lanes, some of which are located near waters that large whales frequent. For example, the main shipping lane to Boston traverses the Stellwagen Bank National Marine Sanctuary, a major feeding and nursery area for several species of baleen whales. Similarly, Cape Cod Canal, another major conduit for shipping along the New England coast, provides passage from Buzzards Bay to Cape Cod Bay, an area known for large whale activity (Hoyt, 2001; NMFS, 2001b). In 1999, 1,431 commercial ships used the port of Boston (NMFS, 2001b). In a 1994 survey, 4,093 commercial ships greater than 20 meters in length passed through the Cape Cod Canal, with an average of 11 commercial vessels crossing per day (Wiley et al., 1995).

In southeastern waters, shipping channels associated with Jacksonville and Fernandina, Florida, as well as Brunswick, Georgia bisect the area that contains the highest concentration of whale sightings within right whale critical habitat. These channels and their approaches serve several commercial shipping ports and military bases. The commercial ports are growing and the port of Jacksonville is undergoing major expansions (NMFS, 2001b).

In the Northeast Atlantic, various initiatives have been planned or undertaken to expand or establish high-speed watercraft services. In 1998, high-speed ferry service was initiated between Bar Harbor, Maine and Yarmouth, Nova Scotia. The ferry makes regular runs during Nova Scotia's busy tourist season, which coincides with peak concentrations of right whales feeding on summering grounds. The 91-meter (300-foot) catamaran travels at speeds up to 90 kilometers per hour (48 knots).

[9] Most whales swim at three to four knots. When frightened, some whales can swim seven to 14 knots, while a few can reach more than 26 knots. Laist et al. (2001) note several plausible explanations for their observation that collisions leading to serious injury or death generally involve vessels traveling at speeds greater than 13 knots: (1) whales are far more successful at avoiding ships moving at less than 13 knots; (2) ships spend most of their transiting time at speeds of 13 knots or above; (3) collisions at speeds of less than 13 knots are less likely to injure whales seriously or to damage ships, and thus are less likely to be noted and reported; and/or (4) the low number of collisions at speeds of less than 13 knots is an artifact of the small sample size of the collision records available.

Smaller vessels are also known to strike marine mammals, and whale strikes resulting from interaction with whale watch boats and recreational vessels have been recorded. In New England, approximately three dozen whale watch companies operate 50 to 80 boats (NMFS, 2001b). In addition, over 500 fishing vessels and over 11,000 pleasure craft frequent the waters of Massachusetts and Cape Cod Bays (NMFS, 2001b). All of these vessels pose some risk to whales. Although minor vessel collisions may not result in immediate death, the event may weaken or otherwise harm the whale, increasing its vulnerability to other effects such as entanglements, pollution, or disease.

Species Most Affected

Laist's review found records of ship collisions involving 11 species of large whales. The species most commonly struck by ships was the fin whale, followed by the North Atlantic right whale and the humpback whale. However, the frequency with which these incidents occur and are reported is strongly influenced by the distribution and abundance of the whale species. Exhibit 9A-1 in Appendix 9-A provides data on ship collisions involving right, humpback, fin, and minke whales over the last two to three decades.

Laist et al. (2001) concluded that for some large whale populations, the number of ship strikes has little impact on stock status, but for the dwindling North Atlantic right whale population, ship strikes are a serious obstacle to the growth and successful recovery of the species. The behavior of right whales makes them particularly vulnerable to collisions.[10] Right whales swim close to shore and in or adjacent to major shipping lanes. In addition, they spend much of their time at the surface, skim feeding, resting, mating, and nursing. These behaviors can occur for periods of an hour or more. Calves, which spend most of their time at the surface due to their undeveloped diving capabilities, are particularly vulnerable.

Of 47 reported right whale deaths between 1970 and 2001, at least 14 were the result of ship strikes (Exhibit 9-4). Six right whale mortalities between 1970 and 1991 were caused by ship propellers that severed the tail stock or spine or caused mortal crushing blows to the head. In 2001, two calves were killed by ship strikes, one off Assateague Island in Virginia and the other off Long Island, New York.

[10] Observations of right whales indicate that responses to vessels are dependent on the whale's behavior at the time. Courtship and surface feeding are examples of behaviors during which northern right whales appear unresponsive to the approach of boats. Cows with calves and single long-diving whales appear to be more sensitive to engine noise or vessel maneuvering and have been observed avoiding boats.

Exhibit 9-4

RIGHT WHALE MORTALITIES FROM SHIP STRIKES, 1970 THROUGH 2001

Region	Total Documented Mortalities[1]	Mortalities from Ship Strikes
Southeast	20	3
Mid-Atlantic Coast	9	3
Great South Channel	4	3
Cape Cod Bay	2	1
Gulf of Maine	1	1
Bay of Fundy	5	3
Other/Unknown	6	Not available
TOTAL	47	14

Notes:
[1] Total documented mortalities includes mortalities from entanglement or unknown causes.

Source: Russell and Knowlton, 2001.

The actual rate of ship collisions with right whales is considered to be much higher than the data indicate. Experts generally believe that many ship strikes go unreported or undetected. In addition, minor ship collisions that may not mortally injure a whale can often weaken the whale, making it more susceptible to further injury (Kraus et al., 1993).

Efforts to Track and Reduce Ship Strikes

NMFS' ongoing program over the last decade to reduce ship strikes to right whales includes aerial surveys to notify mariners of right whale sighting locations, operation of the northeast U.S. and southeast U.S. mandatory ship reporting systems to provide information to mariners entering right whale habitat, working with the U.S. Coast Guard (USCG) to issue periodic notices to mariners regarding ship strikes, support of Recovery Plan Implementation Teams that provide recommendations to NOAA Fisheries on recovery activities, support of shipping industry liaisons, and Endangered Species Act (ESA) section 7 consultations.

Recognizing the persistent threat that ship strikes pose to North Atlantic right whales, a joint effort between NMFS and the International Fund for Animal Welfare formed the Northeast Implementation Team, also known as the Ship Strike Committee, in 1994. The Committee identified a range of options for reducing the risk of ship strikes, including routing vessels around high-risk areas, restricting vessel speeds to a maximum of ten knots in high-risk areas, and changing routes to minimize time in those areas. The Committee submitted its recommendations in a report to NMFS in 2001. NMFS used the report on recommended ship strike reduction management measures as a baseline to develop a proposed Strategy to Reduce Ship Strikes of Right Whales (Strategy), a multi-year blueprint of the specific steps to reduce or eliminate the threat of ship strikes to right whales along the U.S. eastern seaboard. The Strategy takes into account regional differences in oceanography, commercial ship traffic patterns, navigational concerns, and whale biology. Actions needed to execute the overall project include rulemaking, international measures, and various analyses (i.e., economic analyses, NEPA, Port Access Route Studies).

The proposed Strategy was approved by the agency in 2003, and interagency working group meetings were subsequently held to review and provide comments on the Strategy. NMFS published an Advance Notice of Proposed Rulemaking on June 1, 2004 (69 FR 30857) to solicit comments on proposed operational measures for the shipping industry contained within the Strategy, including consideration of routing and speed restrictions. These measures, as proposed, would be implemented within each of three broad regions - the southeastern coast of the U.S., the Mid-Atlantic region, and the northeastern coast of the U.S. - and would contain specific areas (with boundaries) and times in which protective measures would be in effect. The operational measures proposed in the Strategy would generally apply to vessels 65 feet (19.8 meters) and greater, based on information regarding confirmed ship strikes and known vessel size. In June 2005, NMFS released a draft Environmental Assessment to analyze the potential environmental impacts of the operational measures of the Ship Strike Strategy (NMFS, 2005). NMFS released a proposed rule in June 2006 (June 26, 2006, 71 FR 35229; August 14, 2006, 71FR 46440) and a Draft Environmental Impact Statement in July 2006 (July 7, 2006, 71 FR 38640; July 14, 2006, 71 FR 36299).

Concurrently, as an additional component of the Strategy, NMFS is preparing a review of the need for ESA section 7 consultations with all Federal agencies who operate or authorize the use of vessels in waters inhabited by right whales. In addition, NMFS submitted a proposal to the International Maritime Organization (IMO) in 2006 to amend the Boston Traffic Separation Scheme to reduce the likelihood of ship strikes. The IMO has voted to adopt this proposal, shifting and narrowing Boston's shipping lanes to reduce their overlap with waters in which right whales and other large whales are frequently found.

According to Laist et al. (2001), ship operators often do not see whales that they strike, or see them too late to avoid a collision.[11] To address this problem, NOAA developed and, in late 1996, implemented the Northeast Right Whale Early Warning System (EWS), now known as the Right Whale Sighting Advisory System (SAS); a complementary system, the Mandatory Ship Reporting (MSR) System, was implemented in July 1999. SAS uses air and ship surveys to provide real-time right whale sighting information to the commercial shipping industry and vessel operators. It provides data to MSR, which operates year-round in a 6,700 square mile area off of Cape Cod, including all 842 square miles of the Stellwagen Bank National Marine Sanctuary, and from November 15 through April 15 in a 2,500 square-mile nursery area near the Georgia/Florida border. Under the system, all commercial ships of 300 gross tons or more that enter the two areas must contact a Coast Guard-operated shore station to report course, speed, location, destination, and route. In return, a ship will receive the latest information about right whale sightings and avoidance procedures that may prevent a collision. The reporting system affects no other aspect of vessel operations and is provided as a free service to vessel operators. Officials also plan to use the ship reporting system to gather data on the number and traffic patterns of ships travelling through right whale habitat to identify other possible measures to reduce future ship strikes. The entire program is to be reviewed after three to five years to assess

[11] Mariners may have difficulty seeing right whales because of their dark color and low profile in the water. In some cases, ships may hit right whales without ever knowing a collision occurred. Laist et al. (2001) found that many ship strikes involving vessels over 400 feet appear to go unrecognized by the vessel's crew; those that are recorded are often discovered when the whale becomes pinned to the vessel's bow and is noticed upon entering port.

its effectiveness, and to introduce advances in ship communication technologies that have become available.

Canada has also taken measures to reduce collisions between ships and right whales within its waters. During the late summer to early fall, over two-thirds of the North Atlantic right whale population can be found in the Bay of Fundy, an area traversed by shipping lanes to the Port of Saint John, New Brunswick. About 800 vessels, primarily tankers transporting crude and refined oil products, use the shipping lanes leading to this major port each year. Conservation areas for the right whale were designated by the Canadian government in 1993, encompassing the shipping lanes leading to St. John. Fundy Traffic, a Vessel Traffic System, was soon implemented in the Bay of Fundy to monitor all vessels 65 feet (20 meters) or greater in length that enter the area. The system, like NOAA's EWS, notifies vessels of right whale sightings and provides other relevant information. In April 2002, Transport Canada submitted a proposal to the IMO to amend the traffic separation scheme (TSS)[12] in the Bay of Fundy.[13] The Canadian proposal was adopted at the annual meeting of the IMO's Marine Safety Committee the following December (Canada News Wire, 2003). The changes took effect July 1, 2003 and shifted traffic lanes in the northern TSS area to the east, where the population density of right whales is considerably lower (Transport Canada, 2003).

Over the past decade, the threat of ship collisions to the right whale species has also prompted increased attention by the research community. Ongoing research efforts have focused on developing a better understanding of right whale behaviors around vessels, and the development of new technologies (e.g., passive acoustics monitoring, predictive modeling and sonar detection) to improve management of vessel-whale interactions.[14]

9.4.1.4 Water Pollution

Impacts

Experts believe that pollution in the marine environment adversely affects marine mammals, including cetaceans. Sub-lethal direct effects of exposure to chemical pollutants may alter cetacean physiology, including reproduction, immune defense, endocrine system functions, and possibly neural systems that control social and migratory behavior. Indirect effects include impacts on cetacean prey species and cetacean exposure to pollutants present in prey. Although little direct evidence of the link between chemical pollution and cetaceans is available, evidence of the adverse effects of pollution on terrestrial species and non-cetacean marine mammals is sufficient to warrant concern of similar impacts on cetacean species.

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[12] The TSS provides for the separation of traffic between the southeastern entrance to the Bay of Fundy and the Port of Saint John, organizing traffic through an area used extensively for fishing. Since the establishment of the TSS in 1983, extensive research has been compiled demonstrating the need for changes to help protect the North Atlantic right whale population in this area.

[13] The International Maritime Organization is the United Nations agency responsible for improving ship traffic and safety.

[14] For more information on ongoing research efforts, see Russell et al., 2001.

Types of contaminants entering the coastal environment from both point and non-point sources include suspended solids, organic debris, metals, synthetic organic compounds, nutrients, and pathogens. The coastal waters near Boston, Massachusetts have historically been among the most contaminated in North America, with elevated concentrations of trace metals, PCBs and petroleum hydrocarbons (Pearce, 1990). Additional chemical and nutrient loads flow into Massachusetts Bay from the Merrimack River in the north, and several other large rivers from the southern coast of Maine (EPA, 1993). Contaminant sources include sewage and industrial discharges, combined sewer overflows, stormwater runoff, groundwater inflows, in-place sediments, seeps, and atmospheric deposition (MBP, 1991). Dominant current patterns in the Northeast make it probable that industrial pollutants released into coastal waters will affect important feeding areas off the coast of Massachusetts and Cape Cod Bay. In addition, the proximity of large whale habitats to major shipping lanes introduces the potential of chemical exposure from aromatic hydrocarbons (oil spills, leaks, and discharges) and organotins (leaching from hulls).[15]

The Massachusetts Bay Disposal Site (MBDS), located 9.5 miles east of Deer Island, began discharging secondary sewage effluent into Massachusetts Bay about 16 miles from identified right whale critical habitat in 2000 (NMFS, 2001a). NMFS concluded in a 1993 biological opinion that the discharge of sewage at the MBDS may affect, but is not likely to jeopardize, the continued existence of any species listed or proposed to be listed under the ESA. Uncertainties remain, however, concerning potential impacts on the marine ecosystem, the food chain, and endangered species. In light of these uncertainties, the Massachusetts Water Resources Authority is conducting post-discharge monitoring.

Exhibit 9-5 lists chemical contaminants of possible concern to North Atlantic right whales. The list was compiled at a workshop held in Falmouth, Massachusetts in April 2000, convened to identify and set research priorities for potential factors affecting right whale reproduction. The list includes contaminants to which right whales may be exposed, based on (1) trophic level and prey selection, (2) known patterns of chemical use, and (3) the existence of a regional source. Given the overlapping ranges of all four key Atlantic large whale species and their mutual classification as baleen whales, the list can be used as a preliminary guide to those contaminants that might also affect humpback, fin, and minke whales.

[15] For more information see Busbee et al., 1999.

Exhibit 9-5

CLASSES AND EXAMPLES OF CONTAMINANTS POTENTIALLY AFFECTING NORTH ATLANTIC RIGHT WHALES

Chemical Class	More Specific Compounds or Examples
Persistent organic pollutants	PCBs, PCDDs, PCDFs, PAHs[16], DDT, chlordanes, HCH, other pesticides
Flame retardants	PBDEs (polybrominated diphenyl ethers) and other brominated flame retardants
Plasticizers	Phthalate esters
Surfactants	Alkylphenol ethoxylates
New-era pesticides and herbicides	Not available
Municipal and industrial effluents	Endocrine disrupting compounds (e.g., synthetic estrogens, natural hormones, pulp byproducts)
Anti-fouling agents	Organotins and replacement compounds
Dielectric fluids	PCB replacements (e.g., PCNs – polychlorinated naphthalenes; PBBs – polybrominated biphenyls)
Aquaculture-related chemicals	Antibiotics, pesticides
Metals	Methyl mercury (MeHg) via atmospheric deposition
Radionuclides	Not available

Source: Reeves et al., 2001. For more detailed lists and further discussion, also see O'Shea et al., 1999 and Reijnders et al., 1999.

Whales are particularly vulnerable to chemical pollutants because they are long-lived, have extensive fat stores (where chemical pollutants are known to accumulate), and are often top predators in the food chain. Chemical pollutant levels in baleen whales, however, have consistently been found to be one to two orders of magnitude lower than levels found in seals and odontocetes, or toothed cetaceans. This is largely attributed to the fact that baleen whales feed primarily on plankton, krill, and small fish that are at the top of a much shorter food chain and therefore have lower accumulated levels of chemical pollutants.[17] Right whales may even be further protected from this type of risk because of their preference for copepods, a low trophic level organism, making them less susceptible to the bioaccumulation of organochlorines and metals than humpback, fin, or minke whales, all of which feed more regularly on small fish.[18]

Concentrations of organochlorines, including dichloro-diphenyl-trichloroethane (DDT), polychlorinated biphenyls (PCBs), hexachlorohexanes (HCHs), aldrin, and dieldrin, have been observed in many species of marine mammals, including right, humpback, and fin whales in the North Atlantic. PCBs were found in samples of North Atlantic right whale blubber (Weisbrod et al., 2000a) and at low levels in zooplankton sampled from Cape Cod Bay (Reeves and Clapham, 2001). Woodley et al. (1991) found PCBs, DDT, and other organochlorines in northern right whale biopsy samples from the Bay of Fundy, Browns, and Baccarro Banks (Woodly et al., 1991). Organochlorines have also been reported in humpback, fin, and minke whales (Gauthier et al., 1997; Hobbs et al., 2003), fin and sei whales (Borrell, 1993; Borrell and Aguilar, 1987), and pilot whales (Muir et al., 1988).

[16] Roper and Cherry, 1994.

[17] For more information see Aguilar et al., 1999.

[18] For more information see O'Shea et al., 1994.

Heavy metal concentrations have also been observed in many species of marine mammals.[19] Sanpera et al. (1993) analyzed tissue samples from 36 fin whales from the Northeast Atlantic for their total and organic mercury concentrations. A positive correlation between age and the concentration of mercury in the liver was found, suggesting a slow and steady rate of accumulation over time and a low rate of excretion (Sanpera et al., 1993).

A final source of potential pollution stress is biotoxins. Biotoxins are highly toxic compounds produced by harmful algal blooms (HABs).[20] There is strong evidence that higher trophic level marine organisms, such as cetaceans and marine turtles, can acquire lethal or sub-lethal doses of these phytoplankton-derived toxins through consumption of zooplankton and planktivorous finfish. Five major classes of biotoxins are associated with HABs: saxitoxins (responsible for paralytic shellfish poisoning); brevetoxins (responsible for neurotoxic shellfish poisoning in the southeastern U.S.); domoic acid (amnesic shellfish poisoning); okasdaic acid and dinophysistoxins (diarrhetic shellfish poisoning); and ciguatoxins. The first three of these classes have been implicated in marine mammal mortality events (Reeves et al., 2001).

Saxitoxins, brevetoxins and domoic acids are the three HAB groups that occur most often in the distribution range of the four ALWTRP species. Saxitoxins cause loss of equilibrium and respiratory distress, with possible implications for feeding efficiency (Reeves et al., 2001; NEFSC, 2003a). An acute exposure to saxitoxin-contaminated mackerel was found to have caused the death of at least 14 humpbacks, two fin whales, and a minke whale off the coast of Massachusetts between November 1986 and January 1988 (Geraci, 1989). In August 2003, another multiple whale mortality occurred on Georges Bank and is suspected to be the result of exposure to domoic acid, a neurotoxin that once prompted the closing of a scallop fishery in the mid-1990s (CCEHBR, 2003). In this case, 17 dead whales were found floating over a 125-mile stretch of ocean between Canada and the U.S. At least six of the dead whales were humpbacks; another was a fin whale (NEFSC, 2003b). The event initially raised fears that the North Atlantic right whale might also be at risk, but none appear affected to date. These events, however, indicate that the impact of harmful algal blooms and biotoxins may be greater than previously thought.

[19] For more information see Bowles, 1999.

[20] Algae are photosynthetic plant-like organisms that live where there is water. Most species of algae or phytoplankton are not harmful and serve as the energy producers at the base of the food web, without which higher life on this planet would not exist. Occasionally, the algae grow very fast or "bloom" and accumulate into dense, visible patches near the surface of the water. "Red Tide" is a common name for such a phenomenon where certain phytoplankton species contain reddish pigments and "bloom" such that the water appears to be colored red.

Efforts to Control Water Pollution

A number of Federal statutes and international agreements are designed to control water pollution at the national or international level. Past and present actions examined include:

- the Clean Water Act;
- the Coastal Zone Management Act of 1972;
- the Marine Protection, Research, and Sanctuaries Act of 1972;
- the Oil Pollution Act of 1990; and
- international laws regarding marine pollution.

Clean Water Act

The Federal Water Pollution Control Act, or the Clean Water Act (CWA), is the principal Federal law controlling polluting activities in the nation's streams, lakes, and estuaries. Originally enacted in 1948, a series of amendments in 1972 and 1977 gave the Act its current shape and structure. The Act consists of two major parts: regulatory provisions to control industrial and municipal dischargers, and financial assistance provisions to help fund the construction of municipal wastewater treatment facilities.

Prior to 1987, provisions under the CWA were primarily directed at controlling point source discharges of pollution; i.e., pollution originating from discrete and identifiable sources, such as municipal and industrial facilities or bypasses and overflows from municipal sewage systems. In 1987, Congress passed the most extensive changes yet to the CWA, directing new attention to non-point source water pollution, which accounted for an increasing proportion of the nation’s remaining water quality problems. The 1987 amendments added Section 319 to the Act, requiring states to develop and implement programs to control non-point sources of pollution, including runoff from farm and urban areas, construction, and forestry and mining sites.

A number of the provisions included in the CWA contribute indirectly and directly to maintaining the water quality of the marine environment. Specifically, one of the goals of the Act is to provide for the protection and propagation of fish, shellfish, and wildlife (33 U.S.C. 1251(a)(2)). In addition, the Act contains provisions to address bottom sediment removed by dredging, which now constitutes the majority of material dumped into the nation’s coastal and marine waters (Boesch et al., 2001). Under the CWA, the U.S. Army Corps of Engineers issues permits for the disposal of dredged material, subject to guidelines established by EPA. Protocols have been developed to determine whether dredged sediments are suitable for placement in the ocean or coastal environment.

Coastal Zone Management Act of 1972

The Coastal Zone Management Act (CZMA) encourages environmentally sound management of coastal areas and provides grants to be used in maintaining coastal areas. It requires that Federal agencies be consistent with the enforceable policies of state coastal zone management programs when conducting or supporting activities that affect a coastal zone. As defined in the Act, the coastal zone includes coastal waters extending to the outer limit of state submerged land title and ownership, adjacent shorelines, and land extending inward to the extent necessary to control shorelines. The coastal zone includes islands, beaches, transitional and intertidal areas, and salt marshes.

Marine Protection, Research, and Sanctuaries Act of 1972

The Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA, P.L. 92-532) has two basic aims: (1) to regulate intentional ocean disposal of materials, and (2) to authorize related research. Title I of the Act, often referred to as the Ocean Dumping Act, prohibits dumping of all municipal sewage, sewage sludge, and industrial waste, and regulates the disposal of dredged material under a Department of the Army permit. The EPA also designates sites and imposes strict tests for dredged material disposal. Research provisions concerning general and ocean disposal research are contained in Title II; Title III authorizes the establishment of marine sanctuaries; Title IV established a regional marine research program; and Title V addresses coastal water quality monitoring.

Oil Pollution Act of 1990

After the *Exxon Valdez* oil spill devastated the Alaskan coastline in 1989, Congress passed the Oil Pollution Act of 1990. The Act established an extensive liability scheme designed to ensure that, in the event of a spill or release of oil or other hazardous substances, the responsible parties are liable for the removal costs and damages that result from the incident. A "responsible party" includes the owner, operator, or demise charterer of a vessel. Additionally, a responsible party may be liable for removal costs and damages to natural resources; real or personal property; subsistence use; revenues, profits and earning capacity; and public services.

International Laws Regarding Marine Pollutants

The International Maritime Organization (IMO) is the United Nations specialized agency responsible for improving maritime safety and preventing pollution from ships. Pollution of the marine environment by ships of all types, including commercial fishing vessels, is strictly controlled by the International Convention for the Prevention of Pollution from Ships (known as MARPOL 73/78). The MARPOL 73/78 Convention is a combination of two treaties adopted in 1973 and 1978, respectively, and has been updated by amendments over the years. Any violation of the MARPOL 73/78 Convention within the jurisdiction of any Party to the Convention is punishable either under the law of that Party or under the law of the flag state.

9.4.1.5 Noise Pollution

Impacts

Whales, dolphins, and other marine mammals primarily rely on their hearing to locate food, detect predators, find mates, and keep herds together. Large whales communicate primarily using low-frequency sounds (typically below 1000 Hertz) that travel long distances through water (NRDC, 1999). The growing amount of noise within this range from ships, supertankers, underwater explosions, and other sources represents an additional potential threat to large whales. Noise pollution may disrupt and inhibit feeding and reproduction; displace whales from traditional calving grounds, feeding grounds, or migratory routes; or, in the worst case, cause direct auditory damage and death. Noise pollution sources include ship and boat propeller noise; drilling, blasting, and dredging; acoustic deterrent devices used by fish farms and fishing vessels; sonar and airguns used in seismic exploration; and the use of low- and mid-frequency sonar in military operations. In recent years, this new source of stress has garnered increased attention from both the scientific community and the general public. The impact of acoustic pollution, however, has been difficult to ascertain, and its effect on marine mammals is one of the least understood subjects within marine mammal science.

The best-known noise pollution incident occurred in March 2000 with the stranding of 17 cetaceans of at least four different species (three species of beaked whale and one species of baleen whale) in the Bahamas. Seven of the stranded animals are known to have died, while ten other animals were returned to the water alive. An investigation jointly undertaken by the Navy and NOAA concluded that mid-range frequency sonar aboard U.S. Navy ships transiting the area represented the most plausible source of the event (NMFS, 2001c). Other recent incidents associated with underwater sonar use at mid-range frequencies include a 1996 stranding of a dozen Cuvier's beaked whales off the coast of Greece, and most recently, in 2002, a stranding of 18 whales (11 died) in the Canary Islands. Both of these incidents coincided with North Atlantic Treaty Organization (NATO) units carrying out naval acoustic exercises in the area (Government of the Canary Islands, 2002). A recent study following up on the 2002 stranding event, released in the journal *Nature*, provides the “most direct evidence to date that sonars can kill marine mammals” (Dalton, 2003). The study concluded the deaths were a result of decompression sickness after the whales shot to the surface to escape sonar activity during Spanish-led international naval exercises (Jepson et al., 2003).

Although acute mortality from noise pollution is established, much less is known about the impact of chronic noise pollution on cetacean health. Potential impacts from long-distance undersea noise vary from no effect to temporary hearing loss or long-term behavioral changes that may reduce whale survival and reproduction. One response of particular concern is the potential for the displacement of cetacean populations as a result of high levels of anthropogenic noise.

In the Atlantic, the three primary sources of anthropogenic ocean noise include shipping, offshore oil activities, and military exercises. Anthropogenic ocean noise is principally the result of the relatively recent increase in shipping traffic. A modern-day supertanker cruising at 17 knots fills the frequency band below 500 Hz and produces sounds of 190 decibels or more. Mid-sized ships such as tugboats and ferries produce sounds of 160 to 170 decibels in the same

frequency range (NRDC, 1999). Whale-watching vessels also have the potential to disrupt cetacean behavior. A survey of the response of baleen whale species to whale-watching vessels was done in 1986, and found that minke whales, humpback whales, and fin whales appeared to habituate to boats, while right whales exhibited no change in behavior.[21] Another study of fin whales in the Gulf of Maine found significantly reduced dive times and a reduced number of blows per surfacing sequence when whale-watching vessels were present (Stone, 1986). Other studies have found similar results, but whether this change in behavior represents an adverse impact to cetaceans is largely unknown.

The most serious consequence of vessel disturbances is the potential for the cumulative effects of vessel traffic to cause an abandonment or decrease in the use of an important habitat (Tyack, 1990). There have been documented cases of this phenomenon with bottlenose dolphins (Evans et al., 1993), harbor porpoises (Evans et al., 1994), beluga whales (Finley et al., 1990), and sperm whales (Mate et al., 1994) in association with seismic exploration and vessel traffic. There also has been suspected habitat abandonment in response to boating activity, aircraft, and industrial activity (e.g., dredging) by humpback whales (Green, 1991), blue whales (Macfarlane, 1981 in Gordon and Moscrop, 1996), grey whales (Reeves, 1977 in Richardson et al., 1995) and bowhead whales (Richardson et al., 1987).

A second source of significant ocean noise is offshore oil and petroleum exploration activity. Offshore oil exploration requires the use of drilling rigs and airgun arrays, both of which produce high-energy, low-frequency undersea noise. To detect oil deposits beneath the ocean floor, most companies rely on the explosive power of airguns, arranged in rows behind a small ship. The guns fire at short intervals and can produce sounds over 250 decibels. To extract the oil, platforms and pipes are constructed, drills positioned, and holes bored into the bedrock. In the Atlantic Outer Continental Shelf (OCS) area, the potential for noise pollution associated with offshore oil and petroleum exploration exists.[22] According to the Minerals Management Service (MMS), a total of 433 blocks in the Atlantic OCS area have been leased for exploration, and a total of 49 exploratory wells have been drilled (MMS, 2003).

Although the evidence is limited, military activities have the potential to disturb, injure, or kill Atlantic large whales. In early 1996, six right whale deaths were documented. Five of these (one attributed to a ship strike) occurred in waters adjacent to the Southeast U.S. (SEUS) critical habitat area. Navy facilities adjacent to the critical habitat use offshore areas for gunnery exercises. Because several of the carcasses were found near a Navy gunnery range, it was

[21] It has been suggested that the type of activity in which right whales are engaged influences their sensitivity to, and tendency to avoid, noise disturbance and vessel activity, but more studies are needed (Watkins, 1986).

[22] The continental shelf is the gently sloping undersea plain between a continent and the deep ocean. Under U.S. law, the Outer Continental Shelf (OCS) consists of the submerged lands, subsoil, and seabed lying between the seaward extent of the states' jurisdiction and the seaward extent of Federal jurisdiction. In 1953, Congress designated the Secretary of the Interior to administer mineral exploration and development of the entire OCS through the Outer Continental Shelf Lands Act (OCSLA). Under the Act, the OCS has been divided into four leasing regions: the Gulf of Mexico OCS Region; the Atlantic OCS Region; the Pacific OCS Region; and the Alaska OCS Region.

suspected that some deaths were related to underwater explosions; however, no conclusive link was established.[23]

Additional controversy has surrounded the potential use of Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar. SURTASS LFA is a long-range, low frequency (between 100 and 500 Hertz) sonar system that has both active and passive components. The sonar's detection capability does not rely on noise generated by the target, but rather on the use of active sounds or pulses originating from the system. The purpose of SURTASS LFA sonar is to provide the Navy with a reliable and dependable system for long-range detection of quieter, harder-to-find submarines. Its low frequency sound travels in seawater more effectively and for greater distances than the higher frequency sound used by most other active sonar systems (U.S. Dept. of Navy, 2001).

To evaluate the impact of the system on endangered species, the Navy funded an independent study on the effect of LF sonar on four baleen species of whales (blue, fin, gray, and humpback whales).[24] The research determined that these LF-sensitive marine mammals, when exposed to sound pressure levels (SPLs) ranging from 120 to 150 decibels, exhibited only minor, short-term behavioral responses. Given the uncertainty of the science in this area, however, a number of measures were included in the final NMFS rule on the military use of SURTASS LFA, including use restrictions in coastal zones and a monitoring and detection plan.

Environmental and animal welfare groups have opposed deployment of SURTASS LFA Sonar because of concern that increased noise levels in the marine environment would adversely affect marine mammals and other sea life. Opponents argue that the use of SURTASS LFA represents a global activity that does not qualify for a small take authorization; that it will have more than a negligible impact on marine mammals; that insufficient research has been conducted on short-term and long-term impacts on marine mammals; that marine mammal takings during wartime have not been analyzed; that the monitoring of potential impacts is insufficient; and that the modeling used for impact assessment is faulty. These concerns led the Natural Resources Defense Council (NRDC) and other organizations to file suit against NOAA for failure to enforce the MMPA, ESA, and NEPA. In October 2002, a preliminary injunction was granted against broad deployment of the LFA system. On August 26, 2003, a Federal judge ruled that the Navy's plan to deploy LFA violated numerous Federal environmental laws and could endanger whales, porpoises, and fish. The final decision ordered the Navy to reduce the system's potential harm to marine mammals and fish by negotiating limits on its use with the conservation groups who had sued over its deployment.[25] Currently, the Navy can only test and train personnel in the use of the SURTASS LFA system in a two million square kilometer area near Guam, in the western Pacific Ocean (Dalton, 2003).

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[23] The Navy is in ongoing and open consultations with NMFS on the potential effect of some of its operations on protected species, and has made a number of significant modifications to its operations to facilitate protection of right whales in the SEUS critical habitat (Silber and Clapham, 2001).

[24] The study was limited to these four species of baleen whales because (1) baleen whales are considered to have the best hearing in the low frequency band of all marine mammals, (2) these species have protected status under the law, and (3) there is prior evidence that these species react to low frequency sounds.

[25] For more information, see NRDC v. Evans, Opinion and Order on Cross-Motions for Summary Judgment, Filed August 26, 2003. Available at: http://www.cand.uscourts.gov/.

Individually, each of the sources of undersea noise pollution may not be significant, but the cumulative impact of long-term exposure combined with other whale threats has become the primary concern in this area. Exhibit 9-6 provides NRDC's preliminary list of marine mammal acoustic "hot spots" along the Atlantic coast.

Exhibit 9-6

A PRELIMINARY LIST OF ACOUSTIC HOTSPOTS ON THE ATLANTIC COAST

Hotspot	Adjacent Coast	Some Local Species of Concern	Human Sources of Local Sound
Bay of Fundy	New Brunswick & Nova Scotia	Right, fin, and minke whales, harbor porpoise	Shipping, fisheries
Cape Cod Bay	Massachusetts	Right and humpback whales	Shipping, pleasure craft, whale-watching
Great South Channel	Massachusetts	Right, humpback, fin, and minke whales; numerous odontocetes	Shipping
St. Simons Is. to Melbourne Beach	Georgia & Northern Florida	Right whale	Shipping, dredging, military activity

Source: Natural Resources Defense Council, 1999.

Efforts to Control Noise Pollution[26]

The need for NMFS action on acoustic matters was first identified in 1987, when it was determined that the intense sounds from an acoustic source could potentially harass marine mammals and was therefore subject to the take provisions of the MMPA. Soon thereafter, the NMFS Office of Protected Resources began receiving increasing numbers of requests for authorizations to take marine mammals from activities that produced noise. Two of the projects, the *John Paul Jones* ship shock trial and the ATOC (Acoustic Thermometry of Ocean Climate) project, were highly contentious. By the mid-1990s, NMFS saw a clear need for a coordinated program on this growing issue. Accordingly, in 1995, the agency formed the NMFS Acoustics Program.

Initially, the primary function of the acoustics program was the review and processing of MMPA small take authorizations for permit requests involving acoustic issues. These efforts, however, quickly became insufficient to manage this growing area of concern, and in 1998, the NMFS Office of Protected Resources convened a workshop of experts to review NMFS' acoustic policy. This workshop produced a number of recommendations, including:

- draft acoustic criteria to clearly define acoustic "takes" under the MMPA;
- construct a network for monitoring ocean noise on a global basis;
- provide contact with other agencies, industry, professional societies, environmental NGOs, and news media on acoustic matters;

[26] For more information, see the NMFS Acoustics Program at http://www.nmfs.noaa.gov/prot_res/PR2/Acoustics_Program/acoustics.html.

- outline research that is needed to improve guidelines or regulations on acoustics; and

- obtain additional funding for all programmatic aspects of the acoustics program, including research.

Elements of the NMFS Acoustics Program are being integrated into the small take program, scientific research permits, and other NMFS protected species programmatic responsibilities and functions. Additionally:

- The NMFS Acoustics Program, in cooperation with the Marine Mammal Commission and a number of partners from the scientific research, conservation, and aquarium communities, launched a nationwide public lecture tour to increase public knowledge about human-generated noise and marine animals. This educational lecture series, entitled "Marine Animals and Human Noise," ran from March through November of 2004.

- In 2004, the NMFS Acoustics Program, with the cooperation of a number of governmental and industry co-partners, hosted the 1st International Symposium on "Shipping Noise and Marine Mammals."

- The NMFS Acoustics Program is actively participating in an international effort to standardize acoustic practices in offshore petroleum exploration activities.

9.4.1.6 Climate Change

Impacts

Human induced climate change, caused by increasing greenhouse gas concentrations, has the potential to introduce additional pressures on Atlantic large whales. Key changes that may accompany global warming include increased precipitation, increased ocean temperature, decreased sea ice coverage, and increases and decreases in salinity. Climate change effects of this nature have the potential to influence many aspects of an ecosystem, including habitats, food webs, and species interactions.

A number of studies review and discuss the likely impacts of global climate change on cetaceans, marine mammals, and marine environments in general. Evaluations of the direct effects of climate change on whales are generally confined to cetaceans in the Arctic and Antarctic regions, where the impacts of climate change are expected to be the strongest.[27] It is possible, however, that the indirect effects of climate change on prey availability and cetacean

[27] For example, a doubling of greenhouse gases from pre-industrial times could reduce sea ice in the Southern Hemisphere by more than 40 percent. This could produce adverse effects on the abundance of krill, the primary source of food for whales in this area.

habitat will be more widespread, and could affect large whales in the ALWTRP action area. For example, climate change could exacerbate existing stresses on fish stocks that are already overfished and indirectly affect prey availability for large whale species. Increasing temperature could alter ocean upwelling patterns, fostering increased blooms of dinoflagellates that produce biotoxins. Also associated with higher temperatures is increased precipitation, which could result in more pollutant runoff to coastal waters, elevating cetacean exposure to chemical contaminants.

Habitat shifts are another possible implication of climate change. Walther et al. (2002) examined recent shifts of marine communities in response to rising water temperatures, concluding that most cetaceans will experience roughly poleward shifts in prey distributions (Walther et al., 2002). Distributional habitat shifts may also occur at the local level, but these are highly dependent on complex local attributes, as well as ocean current and weather patterns. Baleen whales are highly mobile species, migrating annually from food-rich areas at high latitudes to breeding areas at low latitudes. It is postulated that baleen whales use currents, salinity, and temperature cues to locate regions of high prey abundance and thus may be less affected by climatic habitat shifts than by a general reduction in prey availability.[28] Nevertheless, any general depression of high latitude prey production and/or poleward shift of feeding grounds could place additional stress on migrating whales. For some whale species, these small changes may have little material effect, but for species already vulnerable because of severe existing problems, like the North Atlantic right whale, these changes could be significant obstacles to species survival.

Efforts to Address Climate Change

Governments and the scientific community are pursuing research to better understand and mitigate the risks associated with climate change. Many cities and states across the U.S. have prepared greenhouse gas inventories and many are actively pursuing programs and policies that will result in greenhouse gas emission reductions.

At the national level, the U.S. Global Change Research Program coordinates the world's most extensive research effort on climate change. In addition, EPA and other Federal agencies are actively engaging the private sector, states, and localities in partnerships aimed at addressing the challenge of global warming while, at the same time, strengthening the economy.[29]

At the global level, countries have expressed a commitment to strengthening international responses to the risks of climate change, resulting in emission reduction agreements such as the Kyoto Protocol. The U.S. is working to strengthen international action and broaden participation under the auspices of the United Nations Framework Convention on Climate Change.

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[28] Evidence suggests a strong relationship between right whale distribution and threshold densities of calanoid copepods (Finzi et al., 1999). For example, right whales do not appear to utilize Cape Cod Bay as a foraging grounds unless the densities of copepods are above a certain minima (Kenney et al., 2001).

[29] For more information, see the US Climate Action Report (U.S. Department of State, 2002).

9.4.1.7 Prey Availability

Impacts

Since the distribution of Atlantic large whales overlaps with many fishing areas, it is possible that whales may be affected by prey availability or competition for prey with fishing activities. For humpback whales, "competition for resources with humans" was identified as a potential impact to this species in the Humpback Whale Recovery Plan (1991). Humpback whales are known to feed on fish species that are directly harvested by humans. In addition, these whales feed on species that are prey for harvested fish. However, information on the magnitude and extent of these potential interactions is not available.

The Biological Opinion addressing the potential effects of the Federal Atlantic herring fishery management plan on threatened and endangered species (1999) outlined potential effects of competition with the herring fishery on Atlantic large whales, in particular humpback and fin whales. Right whales, by feeding primarily on copepods, may be affected by the abundance of small schooling fishes, such as herring, mackerel, and sand lance, which feed on some of the same prey items as right whales. Experts at the 1999 IWC workshop pointed out that since *Calanus* sp. is the most common zooplankton in the North Atlantic and current right whale abundance is greatly below historical levels, food limitations do not seem to be a significant factor (Best et al., 2001). However, the abundance of small schooling fishes may directly affect and be affected by humpback and fin whales. Observations have been made of humpback whales in the vicinity of herring purse seine vessels on Jeffreys Ledge during the summer from 1992 through 1994 (Weinrich et al., 1997). Also, observers deployed in a study conducted in 1997 and 1998 by the Maine Department of Marine Resources reported sightings of fin, humpback, and minke whales in the vicinity of herring operations.

Humpback whale distribution in New England waters is largely correlated with prey species and abundance, along with other factors such as behavior and bottom topography (Waring et al., 2006). These whales usually feed on herring, sand lance, and other small fishes, but in the northern Gulf of Maine, euphausiids are taken as well. In the mid-1970's, commercial depletion of herring and mackerel in the southwestern Gulf of Maine led to an increase in sand lance with a concurrent decrease in humpback whale abundance in the northern Gulf of Maine (Waring et al., 2006). Humpback distribution during the 1970s and 1980s seemed to have shifted away from the northern Gulf of Maine toward the sandy shoals in the southwestern Gulf of Maine. A reversal began in the mid-1980s, when the herring and mackerel populations increased, with a subsequent decrease in sand lance. During 1992 and 1993, humpback abundance rose dramatically in the northern offshore Gulf of Maine (Cultivator Shoal, Northeast Peak of Georges Bank, and Jeffreys Ledge), accompanied by a major influx of herring. These areas are traditional locations of herring occurrence. In 1996 and 1997, both sand lance and humpback whales were abundant again in the Stellwagen Bank area. However, herring populations remained relatively abundant, rather than decreasing as they had in the past. Therefore, humpback whales continued to occupy that area (Waring et al., 2006). These data suggest that the distribution of humpback whales is affected by prey availability; they also show that the whales are able to shift prey species when abundance of a particular prey item decreases.

Efforts to Address Prey Availability

Currently, the effect of prey availability and competition for resources between Atlantic large whales and fishing operations is not known to be affecting the status of these whales. In the case of humpback whales, local stocks are known to utilize alternative prey sources. The current and future regulations to control fishing through the Atlantic herring fishery management plan (FMP) may alleviate potential problems associated with limitations on prey availability. Currently, herring are not overfished and overfishing is not occurring. Amendment 1 to the Atlantic herring FMP seeks to develop alternatives to implement a management program that improves resource conservation and management, eliminate the potential for harvesting capacity to increase above the resource capacity, and provide a platform for economic stability for harvesters, processors, and fishing communities (NEFMC, 2004a).

9.4.1.8 Summary of Factors Affecting Atlantic Large Whale Survival

As described above, the status of large whales in the North Atlantic has been and continues to be affected by a number of anthropogenic risk factors. Exhibit 9-7 summarizes the factors that may adversely affect Atlantic large whale stocks, the past, present, and reasonably foreseeable future actions taken to address each risk factor, and the overall effect of these actions.

Exhibit 9-7

SUMMARY OF FACTORS AFFECTING ATLANTIC LARGE WHALES

Risk Factor	Degree of Certainty	Current Magnitude of Impact	Major Past, Present, and Reasonably Foreseeable Future Actions (PPRFFAs)	Effect of PPRFFAs
Whaling	Known	Low to High[1] (depending on species)	International bans on whaling were implemented in 1935 for right whales; in 1955 for humpback whales; and in 1986 for fin whales and minke whales (although some nations continue whaling of fin and minke whales).	Reduced whaling
Entanglement	Known	High	The initial ALWTRP went into effect in 1997 as an Interim Final Rule. This rule was updated in February 1999, December 2000, January 2002, and August 2003. Additional non-regulatory initiatives include gear research and development; the disentanglement network; and the right whale sighting advisory system.	Reduced entanglement risk
Ship Strikes	Known	High	The Mandatory Ship Reporting System was implemented in July 1999 to provide real-time right whale sighting information to vessel operators. In 1994, NMFS convened a Ship Strike Committee which submitted its recommendations to NMFS in 2001. NMFS published a proposed Strategy to Reduce Ship Strikes of Right Whales (71 FR 36299; 71 FR 46440) to solicit comments on proposed operational measures for the shipping industry contained within the Strategy. In addition, in 2006, NMFS proposed a modification to the Boston Traffic Separation Scheme; the IMO has adopted this proposal.	Reduced mortality and injury from ship strikes
Water Pollution	Suspected	Uncertain	Regulations exist to control water pollution at both the national and international level, including the CWA, CZMA, MPRSA, OPA, and the MARPOL 73/78 Convention.	Positive; however, the direct effect is uncertain.
Noise Pollution	Suspected	Moderate	In 1995, NMFS formed the Acoustics Program to coordinate and integrate NMFS acoustics policy with the small take program, scientific research permits, and other NMFS protected species programmatic functions.	Positive; however, the direct effect is uncertain.
Climate Change	Uncertain	Uncertain	International emissions reduction treaties; extensive research effort on climate change.	Positive; however, the direct effect is uncertain.
Prey Availability	Uncertain	Uncertain	FMP actions to ensure sustainable harvest and prevent overfishing of herring and mackerel.	Positive; however, the direct effect is uncertain.

Notes:
[1] Based on the lack of information on the minke and fin whale populations off of Greenland, including the status of these populations, the takes of these species in this area are considered moderate to high. The IWC has expressed concern that safe catch limits for these populations are not currently available.

Exhibit 9-8 draws on the information presented in this section, and on the entanglement data presented in Chapter 2, to compare the recent impact of different risk factors on fatalities of right, humpback, fin, and minke whales. The exhibit focuses on known fatalities from 1997 through 2001. As the exhibit indicates, the impact of water pollution, noise pollution, climate change, or prey availability on whale mortality is unknown.[30]

With respect to known causes of whale mortality, the relative importance of ship strikes and entanglements may vary by species. In general, inadequacies in the available data (e.g., small sample size, lack of information on the ultimate fate of entangled animals, unequal probabilities of sighting entangled versus ship struck animals, etc.) prevent determining which of these factors is more important. In the case of right whales, entanglements and ship strikes remain of equal concern. In the case of humpback whales, however, the available data for the period 1997 through 2001 suggest a higher number of fishing gear interactions than ship strikes. Waring et al. (2003) reported that during this period, the total estimated human-caused mortality and serious injury to the Gulf of Maine humpback whale stock was 2.6 per year (U.S. waters, 2.0; Canadian waters, 0.6). This average was derived from two components: incidental fishery interaction records at 2.2 per year (U.S. waters, 1.6; Canadian waters, 0.6), and records of vessel collisions at 0.4 per year (U.S. waters, 0.4; Canadian waters, 0). Between 1999 and 2003, the total estimated mortality and serious injury to humpback whales was 3.8 per year (U.S. waters, 2.8; Canadian waters, 0.6; St. Vincent and the Grenadines, 0.4). This average was derived from three components: 1) incidental fishery interaction records, 2.8 (U.S. waters, 2.2; Canadian waters, 0.6); 2) records of vessel collisions, 0.6 (U.S. waters, 0.6; Canadian waters, 0); and 3) directed takes from the Bequian harvest in St. Vincent and the Grenadines (0.4) (Waring et al., 2006). Fin whales, on the other hand, had a greater incidence of ship strike mortalities than fishery interactions. A review of NMFS records from 1997 through 2001 yielded an estimated average of 2.0 human-caused mortalities per year in U.S. waters; 0.6 per year resulting from fishery interactions (U.S. waters, 0.2; Canadian waters, 0.2; Bermudian waters, 0.2) and 1.4 per year resulting from vessel collisions (Waring et al., 2003). The period from 1999 to 2003 yielded an estimated average of 1.4 human-caused mortalities per year, with 0.4 per year resulting from fishery interactions/entanglements (U.S. waters, 0.2; Bermudian waters, 0.2) and 1.0 due to vessel collisions (all in U.S. waters) (Waring et al., 2006). Minke whales, like humpback whales, exhibited a higher incidence of fishery interactions than ship strikes for the period 1997 through 2001; during this period, the total average annual human-caused mortality in U.S. waters was estimated as 3.6 minke whales per year. This estimate was derived from three components: fisheries observer data, 0 mortalities per year in U.S. waters (CV = 0.0); stranding and entanglement data, 3.4 mortalities per year in U.S. waters; and ship strike records, 0.2 mortalities per year in U.S. waters. From 1997 through 2001, there were no confirmed mortalities or serious injuries of minke whales in Canadian waters (Waring et al., 2003). From 1999 to 2003, estimated average human-caused mortality in U.S. waters was 3.2 minke whales per year, a figure that was derived entirely from stranding and entanglement data (Waring et al., 2006). These data suggest that the anthropogenic risk factors that are known to cause serious injury or mortality to large whales may vary by species. All interpretations of the data, however, should consider the uncertainties noted above.

[30] There are no known deaths of whales in North Atlantic waters associated with noise pollution.

Exhibit 9-8

KNOWN FATALITIES BY SPECIES AND CAUSE: 1997 - 2001

Cause	Right Whales	Humpback Whales	Fin Whales	Minke Whales
Commercial or Subsistence Whaling	0	12	60	7,212
Ship Strike	7	10	13	4
Entanglement	2	7	2	14
Water Pollution	N.A.	N.A.	N.A.	N.A.
Noise Pollution	N.A.	N.A.	N.A.	N.A.
Climate Change	N.A.	N.A.	N.A.	N.A.
Prey Availability	N.A.	N.A.	N.A.	N.A.

KEY:
N.A. = Not available

Sources: Waring et al., 1996; Knowlton et al., 2001; Laist et al., 2001; Waring et al., 2003; IWC, 2003; NMFS, 2003a; NMFS, 2003b; Jensen and Silber, 2004.

Exhibit 9-8 makes clear that interaction with commercial fishing gear is not the only anthropogenic risk factor faced by right, humpback, fin, or minke whales. It does not, however, suggest that efforts to reduce the risks associated with gear entanglements are unwarranted or unnecessary. As described in Chapter 2, the depleted status of right, humpback, and fin whale stocks means that the premature death or serious injury of even a few individuals each year can threaten a species' survival. In light of these circumstances, efforts to preserve Atlantic large whale species must take all risk factors into account, including those associated with commercial fishing activity. While the requirements of the ALWTRP and the regulatory alternatives under consideration focus solely on entanglement risks, the commercial fishing regulations developed under the plan are but one dimension of a multi-faceted effort to address the full range of threats to endangered whale species.

9.4.2 Other Protected Species

Chapter 4 identifies several other species, protected either by the ESA of 1973 or the MMPA of 1972, whose range may overlap with ALWTRP regulated fisheries. Chapter 5 assesses the impacts on these species that could result from adoption of the ALWTRP management alternatives. Some of the other protected species, such as the shortnose sturgeon, the Gulf of Maine distinct population segment of Atlantic salmon, roseate terns, and piping plovers, are minimally affected by the commercial fishing operations that are regulated under the ALWTRP and therefore are not addressed by the cumulative effects analysis.

The following section provides a broad discussion of the major threats faced by each of the protected species potentially affected by the ALWTRP, followed by a summary of the significant actions (past, present, and reasonably foreseeable future) taken to mitigate these risks. The species of interest include:

Whales	
Blue Whale	Endangered
Sei Whale	Endangered
Sperm Whale	Endangered
Porpoises and Dolphins	
Harbor Porpoise (Gulf of Maine/Bay of Fundy Stock)	Protected
Western North Atlantic Coastal Bottlenose Dolphin	Protected
Atlantic White-Sided Dolphin	Protected
Risso's Dolphin	Protected
Spotted Dolphin	Protected
Striped Dolphin	Protected
Pilot Whale	Protected
Western North Atlantic Offshore Bottlenose Dolphin	Protected
Common Dolphin	Protected
Seals	
Harbor Seal	Protected
Gray Seal	Protected
Harp Seal	Protected
Sea Turtles	
Kemp's Ridley Sea Turtle	Endangered
Loggerhead Sea Turtle	Threatened
Leatherback Sea Turtle	Endangered
Green Sea Turtle	Endangered
Hawksbill Sea Turtle	Endangered
Olive Ridley Sea Turtle	Threatened

9.4.2.1 Whales

Blue Whale

Only one subspecies of blue whale, *B. musculus,* occurs in the northern hemisphere. In the North Atlantic, blue whales range from the subtropics to Baffin Bay and the Greenland Sea, but they are only occasional visitors to east coast U.S. waters. They are more commonly found in Canadian waters, particularly the Gulf of St. Lawrence, where they are present for most of the year, and in other areas of the North Atlantic.

Though once hunted intensively, blue whales were given complete protection in the North Atlantic in 1955 under the International Convention for the Regulation of Whaling. Photo-identification studies of blue whales in the Gulf of St. Lawrence from 1979 to 1995 identified 320 individual whales. NMFS recognizes a minimum population estimate of 308 blue whales within the Northeast Region (Waring et al., 2002).

There is limited information on the factors affecting natural mortality of blue whales in the North Atlantic. Ice entrapment is known to kill and seriously injure some blue whales during late winter and early spring, particularly along the southwest coast of Newfoundland. Habitat degradation has been suggested as possibly affecting blue whales in the Gulf of St. Lawrence, where habitat has been degraded by acoustic and chemical pollution. However, there are no data to confirm that blue whales have been affected by such habitat changes (Perry et al., 1999).

Ship strikes and entanglements in commercial fishing gear are believed to be the major sources of anthropogenic mortality and injury of blue whales; however, confirmed deaths or serious injuries are few. Thus, human-related interactions are not deemed to be a major source of mortality for this species at this time. To the extent that blue whales are present in waters affected by ALWTRP-regulated gear, they are expected to experience the same benefits from gear modifications required by the ALWTRP as the large whale species these modifications were designed to protect.

Sei Whale

The Nova Scotian Shelf stock of sei whales, which includes the continental shelf waters of the Northeast Region and extends northeastward to south of Newfoundland, is the only sei whale stock within ALWTRP boundaries. Sei whales typically occur in deep water. In the northwest Atlantic, the whales travel along the eastern Canadian coast in autumn on their way to the Gulf of Maine and Georges Bank, where they occur in winter and spring. Within the Northeast Region, the sei whale is most common on Georges Bank, including the Great South Channel, and into the Gulf of Maine/Bay of Fundy region during spring and summer. There are insufficient data to determine trends in the sei whale population. Because there are no abundance estimates within the last ten years, a minimum population estimate for management purposes cannot be determined (Waring et al., 2003).

Possible causes of natural mortality for sei whales, particularly for young, old, or otherwise compromised individuals, are shark attacks, killer whale attacks, and endoparasitic helminthes (Perry et al., 1999). Few instances of injury or mortality of sei whales due to entanglement or vessel strikes have been recorded in U.S. waters. Thus, human-related interactions are not deemed to be a major source of mortality for this species at this time. To the extent that sei whales are present in waters affected by ALWTRP-regulated gear, they are expected to experience the same benefits from gear modifications required by the ALWTRP as the large whale species these gear modifications were designed to protect.

Sperm Whale

In the western North Atlantic, sperm whales range from Greenland to the Gulf of Mexico and the Caribbean and generally occur in waters greater than 180 meters in depth (Leatherwood and Reeves, 1983). Though hunted extensively world-wide until the late 1900s, all killing of sperm whales was banned by the IWC in 1988. The IWC recognizes one stock for the entire North Atlantic. The best estimate of abundance for this stock of sperm whales is 4,702 (CV=0.36) (Waring et al., 2002).

Little information is available about the natural mortality of sperm whales, and though entanglements and ship strikes of this species have been known to occur occasionally, few instances of injury or mortality due to human impacts have been recorded in U.S. waters.

The North Atlantic stock of sperm whales was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes resulting from these types of gear was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT last met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries through the HMS FMP.

At this time, fishery-related interactions are not deemed to be a major source of mortality for this species. To the extent that sperm whales are present in waters affected by ALWTRP-regulated gear, they are expected to experience the same benefits from gear modifications required by the ALWTRP as the large whale species these gear modifications were designed to protect.

It has been suggested that another potential human-caused source of mortality for sperm whales may be the accumulation of stable pollutants such as polychlorinated biphenyls (PCBs), chlorinated pesticides, polycyclic aromatic hydrocarbons, and heavy metals. Though not conclusively caused by contaminant burden, tissue samples from 21 sperm whales involved in a mass stranding in the North Sea in 1994/95 showed cadmium levels twice as high as those found in North Pacific sperm whales, possibly affecting the stranded animals' health and behavior (Holsbeek, et al. 1999).

9.4.2.2 Harbor Porpoise

Harbor porpoises can be found in continental shelf waters throughout the ALWTRP action area, from southern Florida to the Gulf of Maine and Bay of Fundy. The Gulf of Maine/Bay of Fundy stock is categorized as a strategic stock under the MMPA. The best estimate of abundance for this stock is 89,700, with a minimum population estimate of 74,695 (Waring et al., 2003). There is little known about the natural causes of mortality for this species.

Fishery interactions with the Northeast and Mid-Atlantic gillnet fisheries are the primary anthropogenic hazard faced by this species. Harbor porpoises have been taken incidentally in sink gillnets since the 1960s, when a sink gillnet fishery for groundfish was developed in the Bay of Fundy, Canada.[31] Similar fisheries developed along the New England coast in the 1970s. Before 1998, most of the harbor porpoise takes from U.S. commercial fisheries originated from the Northeast sink gillnet fishery. An investigation conducted in 1984 estimated that a maximum of 600 harbor porpoises were killed annually in this fishery (Gilbert and Wynne, 1985, 1987). In

[31] The reference to sink gillnets here is assumed to meet the ALWTRP definition of an anchored net.

1990, NMFS initiated an observer program to investigate marine mammal takes in the Northeast sink gillnet fishery. Observers reported 454 harbor porpoise mortalities related to this fishery between 1990 and 2001. Between 1994 and 1998 (i.e., before implementation of the Harbor Porpoise Take Reduction Plan (HPTRP)), the average annual mortality and serious injury estimate for harbor porpoise in the Northeast sink gillnet fishery was 1,163 (Waring et al., 2003).

The Mid-Atlantic coastal gillnet fishery, which extends from North Carolina to New York, consists of a combination of small vessels that target a variety of fish species. An observer program for this fishery began in 1993. There were no observed harbor porpoise takes in this fishery between 1993 and 1994, but from 1995 through 1998 (i.e., before implementation of the HPTRP), the average annual mortality and serious injury estimate for harbor porpoise was 358 (Waring et al., 2003).

During 1993, 73 harbor porpoises were reported stranded on beaches from Maine to North Carolina. Many of the carcasses recovered in the Mid-Atlantic during this period had cuts and body damage suggestive of net markings (Haley and Read, 1993). Between 1994 and 1996, 107 harbor porpoise carcasses were recovered from beaches in Maryland, Virginia, and North Carolina. Only juvenile harbor porpoises were present in this sample. Of the 40 harbor porpoises for which the cause of death could be determined, 25 displayed definitive evidence of entanglement in fishing gear. In four cases, it was possible to determine that the animal was entangled in monofilament nets (Cox et al., 1998).

Over half of the 228 harbor porpoise strandings recorded in 1999 occurred on beaches in Massachusetts and North Carolina. Virginia, New Jersey, and Maryland had the next greatest numbers of strandings, respectively. The cause of death was investigated for all harbor porpoise strandings in 1999, and 38 individuals were determined to have died as a result of an interaction with fishing gear. During 2000, only 27 harbor porpoises stranded on beaches from Maine to North Carolina. Most of these occurred in Massachusetts (8) and North Carolina (6). During 2001, 113 harbor porpoises were reported stranded, and most of these occurred in Massachusetts (39), Virginia (28), and North Carolina (21). Thirteen of these strandings displayed signs of fishery interactions (Waring et al., 2003).

Harbor Porpoise Take Reduction Plan (HPTRP)

To address the high levels of incidental take of harbor porpoise in the groundfish sink gillnet fishery, a Take Reduction Team was formed in 1996. A rule (63 FR 66464) to reduce harbor porpoise bycatch in U.S. Atlantic gillnets was published on December 1, 1998, and became effective on January 1, 1999 (63 FR 71041). Since gillnet operations differ between the Gulf of Maine and Mid-Atlantic regions, two sets of measures were devised. The Gulf of Maine portion of the plan pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the rule includes time and area closures, some of which are complete closures. Other fisheries are closed to multispecies gillnet fishing unless pingers (sound-making devices) are used in the manner prescribed in the Take Reduction Plan regulations. The Mid-Atlantic portion of the plan pertains to the Mid-Atlantic shoreline from New York to North Carolina. This portion of the rule also

includes gear modifications and time and area closures to mitigate the incidental take of harbor porpoise.

9.4.2.3 Dolphins

Western North Atlantic Coastal Bottlenose Dolphin

Coastal bottlenose dolphins can also be found in continental shelf waters throughout the ALWTRP action area, from southern Florida to the Gulf of Maine and Bay of Fundy. The western North Atlantic stock is categorized as strategic under the MMPA.

Fishery interactions with the Northeast and Mid-Atlantic gillnet fisheries are the primary anthropogenic hazard faced by this species. Western North Atlantic (WNA) coastal bottlenose dolphins are known to interact with commercial fisheries and occasionally are taken in various kinds of fishing gear, including gillnets, seines, longlines, hook and line, shrimp trawls, and crab traps/pots. Interactions are especially common in near-shore areas where dolphin densities and fishing effort are greatest.

The western North Atlantic stock of bottlenose dolphins was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes associated with these types of gear was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT last met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries. In addition, through the HMS FMP, NMFS has implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries.

The MMPA List of Fisheries (LOF) currently designates eleven Category I and II commercial fisheries in the Atlantic that interact with western North Atlantic coastal bottlenose dolphins, several of which fall under the provisions of the ALWTRP: the Mid-Atlantic coastal gillnet, Southeast Atlantic gillnet, and Southeastern U.S. Atlantic shark gillnet fisheries.

Of the fisheries noted above, the Mid-Atlantic coastal gillnet fishery accounts for the highest documented level of mortality or serious injury of WNA coastal bottlenose dolphins. Within this fishery, the North Carolina sink gillnet fishery accounts for the greatest number of observed takes. Bycatch estimates for this fishery are available for 1996 to 2000. Of 12 observed mortalities from 1995 to 2000, five occurred in sets targeting spiny or smooth dogfish and another in a set targeting shark species; two occurred in striped bass sets; two occurred in Spanish mackerel sets; and the remainder were in sets targeting kingfish, weakfish, or finfish generically (Rossman and Palka, 2001).

The shark gillnet fishery in the Southeast overlaps with the Georgia, Northern Florida, and Central Florida management units of the WNA coastal bottlenose dolphin stock complex. The shark gillnet fishery operates in Federal waters from southern Florida to southern Georgia. The fishery is characterized by vessels using relatively large mesh nets (less than ten inches) and

net lengths typically greater than 1500 feet. The fishery primarily uses drifting nets that are set overnight; recently, however, it has begun employing a small number of shorter duration "strike" sets that encircle targeted schools of sharks. During an observer program in 1993 and 1994 and limited observer coverage during the summer of 1998, no takes of bottlenose dolphin were observed (Trent et al., 1997; Carlson and Lee, 2000). However, takes resulting in mortality were observed in the central Florida management unit during 1999 and 2000 (Garrison, 2003).

Trap/pot gear used in several Atlantic fisheries poses another significant threat to bottlenose dolphins. Between 1994 and 1998, 22 bottlenose dolphin carcasses recovered by the Stranding Network between North Carolina and Florida's Atlantic coast displayed evidence of possible interaction with a trap/pot fishery (i.e., rope and/or pots attached, rope marks). Additionally, at least five dolphins were reported to be released alive (condition unknown) from blue crab traps/pots during this time period (Waring et al., 2002). In recent years, reports of strandings with evidence of interactions between bottlenose dolphins and both recreational and commercial crab trap/pot fisheries have been increasing in the Southeast Region (McFee and Brooks, 1998). The increase in reports of such strandings may result from increased effort towards documenting these marks or from underlying increases in mortality.

Bottlenose dolphins are also susceptible to mortality from sources other than the direct result of anthropogenic interactions. From 1997 to 1999, 995 bottlenose dolphins were reported stranded along the Atlantic coast from New York to Florida (Hohn and Martone, 2001; Hohn et al., 2001; Palka et al., 2001). Of these, it was possible to determine whether a human interaction had occurred for 449 (45 percent); it was not possible to determine whether human interactions were involved for the remainder of the stranded animals. An overall average of 34 percent of stranded carcasses were determined to have been involved in a human interaction, but ranged widely from 11 to 12 percent in Delaware and Georgia to 49 and 53 percent in Virginia and North Carolina, respectively.

There are no estimates of indirect human-caused mortality resulting from pollution or habitat degradation. From 1987 to 1988, the WNA coastal bottlenose dolphin population experienced a massive die-off. During the 11-month epidemic, it was estimated that over half of the population died. Possible sources of the event include brevetoxin produced by red tide organisms, environmental contaminants, or natural diseases. The blubber of the stranded dolphins examined from the event contained anthropogenic contaminants in levels among the highest recorded for a cetacean (Geraci, 1989).

In April 2006, NMFS published a final rule to implement the Take Reduction Plan for the WNA coastal stock of bottlenose dolphin (April 26, 2006, 71 FR 24776) to reduce the incidental mortality and serious injury in the Mid-Atlantic gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range. The other Atlantic coastal fisheries include the North Carolina inshore gillnet fishery, Southeast Atlantic gillnet fishery, Atlantic blue crab trap/pot fishery, Mid-Atlantic haul/beach seine fishery, North Carolina long haul seine fishery, North Carolina roe mullet stop net fishery, Southeastern U.S. Atlantic shark gillnet fishery, and the Virginia pound net fishery (NMFS, 2002c). The final rule also revises the large mesh size restriction under the Mid-Atlantic large mesh gillnet rule for conservation of endangered and threatened sea turtles to provide consistency among Federal and state management measures. The measures contained in the final rule include gillnet effort reduction, gear proximity

requirements, gear or gear deployment modifications, and outreach and educational measures to reduce dolphin bycatch below the marine mammals stock's potential biological removal level (PBR).

Atlantic White-Sided Dolphin

The Gulf of Maine stock of Atlantic white-sided dolphins is commonly found in continental shelf waters from Hudson Canyon to Georges Bank and from the Gulf of Maine to the Bay of Fundy. The best estimate of abundance for the Gulf of Maine white-sided dolphin stock is 51,640, and the minimum estimate is 37,904 (Waring et al., 2003).

There is little information available about the natural causes of mortality for this species. Atlantic white-sided dolphins have become entangled in the Northeast sink gillnet, Mid-Atlantic coastal gillnet, pelagic drift gillnet, North Atlantic bottom trawl, and Atlantic squid, mackerel, and butterfish trawl fisheries. The Northeast sink gillnet and the Mid-Atlantic coastal gillnet fisheries are currently regulated under the ALWTRP.

Current bycatch data indicate that takes of pilot whales, common dolphin and Atlantic white-sided dolphin in mid-Atlantic and northeast mid-water and bottom trawl gear fisheries are below PBR for those species. NMFS has established a new Take Reduction Team to help mitigate takes of these species; the initial TRT meeting was held in September 2006.

Risso's Dolphin

The western North Atlantic stock of Risso's dolphins occurs along the continental shelf from Cape Hatteras to Georges Bank. Based on limited survey estimates in U.S. waters, the best estimate of this stock of Risso's dolphins is 29,110, and the minimum estimate is 22,916 (Waring et al., 2002).

According to observer records from 1996-2000, this species has been observed as bycatch in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, and the Northeast multispecies sink gillnet fisheries. Between 1996 and 2000, the estimated mean mortality of Risso's dolphins taken in the pelagic longline fishery was 48 (CV = 0.55) and was 3 (CV = 1.06) for the Northeast multispecies sink gillnet fishery (Waring et al., 2002). The current estimated mortality rate does not include the estimated mortality of nine dolphins in 1998 associated with the pelagic drift gillnet fishery or the estimated mortality of 3.7 dolphins in 1995 associated with the pelagic pair trawl fishery, since these fisheries no longer exist (Waring et al., 2002).[32] The Northeast sink gillnet fishery is currently regulated under the ALWTRP.

[32] Average annual fishery-related mortality estimates are based on observer data between 1990 and 2000.

Pelagic Delphinids (Spotted Dolphin, Striped Dolphin, Pilot Whale, Western North Atlantic Offshore Bottlenose Dolphin, Common Dolphin)

The pelagic delphinid complex is made up of small odontocete species that are broadly distributed along the edge of the continental shelf, where depths range from 200 - 400 meters. These species include the western North Atlantic stock of spotted dolphins, western North Atlantic stock of striped dolphins, western North Atlantic stock of pilot whales, the western North Atlantic offshore stock of bottlenose dolphins, and the western North Atlantic stock of common dolphins.

Spotted Dolphin

Atlantic and pantropical spotted dolphins are difficult to differentiate at sea. Atlantic spotted dolphins are distributed from southern New England south through the Gulf of Mexico and the Caribbean to Venezuela (Waring et al., 2000). Pantropical spotted dolphins are distributed worldwide in tropical and some sub-tropical oceans, occur in the Gulf of Mexico in all seasons, and also occur between Nova Scotia and Florida (Waring et al., 2002). Both species are commonly found in large groups and are known to feed on a variety of prey, including small-to-large epipelagic and mesopelagic fishes and squids, and benthic invertebrates (Perrin et al., 2002).

The best estimate of abundance for Atlantic spotted dolphins is 52,279 (combined estimates for offshore, 15,840, and coastal, 36,439), and the minimum population estimate for this stock is 27,785 (Waring et al., 2000). The best estimate of abundance for pantropical spotted dolphins is 13,117; the minimum population estimate for this stock is 8,450 (Waring et al., 2002). There is little information available about the natural mortality of these two species.

Bycatch of spotted dolphins has been observed by NMFS Sea Samplers in the pelagic drift gillnet and pelagic longline fisheries. The western North Atlantic stock of spotted dolphins (both species) was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes resulting from these types of gear was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT last met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries through the HMS FMP. The total annual average fishery-related mortality or serious injury to this stock from 1996 through 2000 was estimated as zero spotted dolphins (both *Stenella frontalis* and *attenuata*).

Striped Dolphin

Striped dolphins are found in the western North Atlantic from Nova Scotia south to at least Jamaica, in the Gulf of Mexico, and in general prefer continental slope waters offshore to the Gulf Stream (Waring et al., 2000). These dolphins, like spotted dolphins, are commonly

found in large groups that feed on schools of fish. Striped dolphins feed on a variety of pelagic or benthopelagic fish and squid; in the Northeast Atlantic, they primarily feed on cod (Perrin et al., 2002). The best estimate of abundance for striped dolphins is 61,546; the minimum population estimate for this stock is 44,500 (Waring et al., 2000).

Bycatch of striped dolphins has been observed in low numbers by NMFS Sea Samplers in the pelagic drift gillnet and North Atlantic bottom trawl fisheries, but no mortalities or serious injuries have been documented in the pelagic longline fisheries, pelagic pair trawl, Northeast multispecies sink gillnet, and Mid-Atlantic coastal gillnet fisheries (Waring et al., 2000).[33] The total annual average fishery-related mortality to this stock from 1994 through 1998 was estimated as 7.3 dolphins (CV = 0.08).

Pilot Whale

Long- and short-finned pilot whales are found in the Gulf Stream and continental shelf and slope waters. The best estimate of abundance (combined) for the two pilot whale species is 14,524; the minimum estimate is 11,343 (Waring et al., 2003).

Pilot whale bycatch has been observed by NMFS Sea Samplers in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, bluefin tuna purse seine, North Atlantic bottom trawl, Atlantic squid, mackerel, and butterfish trawl, and Mid-Atlantic coastal gillnet fisheries, but no mortalities or serious injuries have been documented in the Northeast multispecies sink gillnet fishery.[34]

The western North Atlantic stock of pilot whales (both long- and short-finned) was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes resulting from these gear types was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries through the HMS FMP.

Based on observer data, the estimated annual average fishery-related mortality or serious injury to the western North Atlantic stock (both species combined) attributable to U.S. fisheries was 215 pilot whales from 1997 through 2001. Of these deaths, 117 are associated with the pelagic longline fishery, 46 are associated with the Southern New England/Mid-Atlantic mixed groundfish trawl fisheries, 40 are associated with the Southern New England/Mid-Atlantic squid, mackerel, and butterfish trawl fishery, 11 are associated with the Northeast Atlantic (Gulf of Maine/Georges Bank) herring fishery, and one is associated with the Mid-Atlantic coastal gillnet

[33] Waring et al. (2000) note that the pelagic drift gillnet and the pelagic pair trawl fisheries no longer exist.

[34] Waring et al. (2003) note that the pelagic drift gillnet and the pelagic pair trawl fisheries no longer exist.

fishery (Waring et al., 2003). The Mid-Atlantic coastal gillnet fishery is currently regulated under the ALWTRP.

Bycatch data indicate that takes of pilot whales occur in both pelagic longline gear and several Atlantic trawl gear fisheries. Because mortality has been close to PBR, the status of the stock has fluctuated between strategic and non-strategic (Waring et al., 2003). In response, in part, to the problem of interactions between pilot whales and commercial fishing gear, NMFS has formed the Atlantic Longline Take Reduction Team (70 FR 36120); the initial TRT meeting was held on June 29 and 30, 2005. Similarly, NMFS has established the Atlantic Trawl Gear Take Reduction Team; the initial meeting of this group was held on September 19, 20, and 21, 2006 (71 FR 54273).

An additional potential human-caused source of mortality for pilot whales is from polychlorinated biphenyls (PCBs) and chlorinated pesticides, moderate levels of which have been found in pilot whale blubber (Taruski, 1975; Muir et al., 1988; Weisbrod et al., 2000b). In addition, high levels of toxic metals, selenium, and PCBs were measured in pilot whales killed in the Faroe Islands (Nielsen et al., 2000; Dam and Bloch, 2000). The population effect of the observed levels of such contaminants is currently unknown (Waring et al., 2003).

Western North Atlantic Offshore Bottlenose Dolphin

The western North Atlantic offshore stock of bottlenose dolphins (*Tursiops truncatus*) ranges from Florida to Georges Bank along the continental slope. The best estimate of abundance is 29,774, and the minimum estimate is 24,199 (Waring et al., 2003).

Little information about natural mortality for this species is available. Bottlenose dolphins are among the most frequently stranded small cetaceans along the Atlantic coast. Many of these stranded animals show signs of human interaction, such as net marks and mutilation (Waring et al., 2003).

Offshore bottlenose dolphin bycatch has been observed by NMFS Sea Samplers in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, North Atlantic bottom trawl, Northeast multispecies sink gillnet, and Mid-Atlantic coastal gillnet fisheries.[35] The western North Atlantic stock of offshore bottlenose dolphins was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes resulting from these gear types was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT last met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries through the HMS FMP.

[35] Waring et al. (2003) note that the pelagic drift gillnet and the pelagic pair trawl fisheries no longer exist.

The estimated annual average fishery-related mortality or serious injury to the western North Atlantic stock attributable to U.S. fisheries was 27 bottlenose dolphins from 1996 through 2000.[36] Of these deaths, 26 are associated with the Northeast multispecies sink gillnet fishery and one is associated with the Mid-Atlantic coastal gillnet fishery (Waring et al., 2003). Both of these fisheries are currently regulated under the ALWTRP.

Common Dolphin

The western North Atlantic stock of common dolphins occurs most frequently north of Cape Hatteras along the continental shelf. The best estimate of western North Atlantic stock abundance is 30,768 common dolphins; the minimum estimate is 23,655 (Waring et al., 2003). Little is known about the natural mortality of this species.

Common dolphin bycatch has been observed by NMFS Sea Samplers in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, North Atlantic bottom trawl, Atlantic squid, mackerel, and butterfish trawl, Northeast multispecies sink gillnet, and Mid-Atlantic coastal gillnet fisheries.[37]

The western North Atlantic stock of common dolphins was included for discussion when the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed in 1996 to address the interaction of marine mammals with Highly Migratory Species (HMS) pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. A draft plan to reduce takes resulting from these gear types was submitted, and though it was not finalized, several protective measures have been implemented for these fisheries. Since the AOCTRT met in 1996, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries through the HMS FMP.

Based on observer data, the estimated annual average fishery-related mortality or serious injury to the western North Atlantic stock attributable to U.S. fisheries was 190 common dolphins from 1997 through 2001. Of these deaths, 90 are associated with the squid, mackerel, and butterfish trawl fishery, 32 are associated with the Southern New England/Mid-Atlantic mackerel trawl fishery, 29 are associated with the Northeast multispecies sink gillnet fishery, 19 are associated with the Southern New England/Mid-Atlantic mixed bottom trawl fisheries, 17 are associated with the mackerel joint venture fishery, and 3 are associated with the Mid-Atlantic coastal gillnet fishery (Waring et al., 2003). Also, between 1990 and 2000 16 common dolphins were hooked and released alive from the pelagic longline fishery (Yeung et al., 2000; Yeung, 2001 as found in Waring et al., 2003). The Northeast multispecies sink gillnet and the Mid-Atlantic coastal gillnet fisheries are currently regulated under the ALWTRP. Although bycatch data indicate that takes of this species have not exceeded PBR (PBR = 242 dolphins) from 1997 to 2001, in prior years, takes from these fisheries have exceeded PBR several times (Waring et

[36] Average annual fishery-related mortality estimates are based on observer data between 1990 and 2000.

[37] Waring et al. (2003) note that the pelagic drift gillnet and the pelagic pair trawl fisheries no longer exist.

al., 2003). Therefore, NMFS is establishing two new Take Reduction Teams to help mitigate these effects.

Atlantic Offshore Cetacean Take Reduction Team

Historically, Highly Migratory Species (HMS) fisheries that affect marine mammals include the pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. In 1996, the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed to address the interaction of these fisheries with Western North Atlantic stocks of right, sperm, humpback, and pilot whales; and common, bottlenose, and spotted (Atlantic and pantropical) dolphins. A draft plan to reduce takes resulting from these gear types was submitted, but an Atlantic Offshore Cetacean Take Reduction Plan was not finalized as a separate entity. Instead, several protective measures were implemented for these fisheries through the HMS FMP. In particular, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and implemented several other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries.

Atlantic Longline Take Reduction Team and
Atlantic Trawl Gear Take Reduction Team

Current data (Waring et al., 2006) indicate that the incidental take of pilot whales in the Atlantic pelagic longline fishery occurs at levels below PBR. The Southeast Fisheries Science Center (SEFSC) released an updated estimate of marine mammal bycatch in the U.S. Atlantic pelagic longline fishery during 2001 and 2002, which included the incidental take of long-finned pilot whales (Garrison, 2003). As a result, NMFS announced the formation of the Atlantic Longline Take Reduction Team in June 2005 (70 FR 36120); the initial TRT meeting was held on June 29 and 30, 2005. The TRT is in the process of identifying regulatory or voluntary measures for the reduction of incidental mortality and serious injury to pelagic delphinids.

Current data (Waring et al., 2006) indicate that the incidental take of common and Atlantic-white sided dolphins and pilot whales in several Atlantic trawl gear fisheries occurs at levels below PBR for these species. NMFS has established the Atlantic Trawl Gear Take Reduction Team to reduce the incidental mortality and serious injury of these species. This team first met in September 2006, and is working to develop a take reduction plan to address the incidental mortality and serious injury of pelagic delphinids.

9.4.2.4 Seals

Harbor Seal

In the western North Atlantic, harbor seals are distributed from the eastern Canadian Arctic and Greenland south to southern New England and New York, and occasionally the Carolinas (Boulva and McLaren, 1979; Gilbert and Guldager, 1998). It is believed that the

harbor seals found along the U.S. and Canadian east coasts represent one population (Waring et al., 2003).

Since passage of the MMPA in 1972, the number of seals found along the New England coast has increased nearly five-fold. The minimum population estimate for harbor seals is 91,546, based on uncorrected total counts along the Maine coast in 2001 (Waring et al., 2003).

Harbor seals were bounty hunted in New England waters until the mid-1960s. This hunt may have caused the demise of this stock in U.S. waters (Katona et al., 1993). Current sources of mortality include human interactions, such as boat strikes and fishing gear, power plant intake (12-20 per year; NMFS, unpublished data), oil, and shooting (around salmon aquaculture sites and fixed fishing gear); and natural events, such as storms, abandonment by the mother, and disease (Katona et al., 1993; NMFS, unpublished data). Interactions with Maine salmon aquaculture operations seem to be increasing, although the magnitude of interactions and seal mortalities has not been quantified (Anon., 1996).

Annually, small numbers of harbor seals regularly strand throughout their migratory range. Most reported strandings, however, occur during the winter period in the southern New England and Mid-Atlantic regions (NMFS, unpublished data). In 1980, more than 350 seals were found dead in the Cape Cod area from an influenza outbreak (Geraci et al., 1981).

Incidental takes of harbor seals have been recorded in groundfish gillnet, herring purse seine, halibut tub trawl, and lobster fisheries (Gilbert and Wynne, 1985 and 1987). Mortalities involving the herring purse seine, halibut tub trawl, and lobster fisheries are reportedly rare.

The Northeast multispecies sink gillnet fishery is responsible for the majority of harbor seal fishery takes on the East Coast of the United States. This fishery is located in the Gulf of Maine and in Southern New England. Average annual estimated fisheries-related mortality and serious injury to the harbor seal stock attributable to the Northeast multispecies sink gillnet fishery from 1997 through 2001 was 953 harbor seals (CV=0.18), well below the PBR for this species, which is 5,493 animals (Waring et al., 2003).

The Mid-Atlantic coastal gillnet fishery was responsible for a minimal number of takes from 1993-1997 and 1999-2001, with observers recording only two mortalities, both in 1998 (Waring et al., 2003). Based on the observer coverage in this fishery, estimated mortality was zero from 1995 to 1997 and 1999 to 2001, and 11 in 1998 (0.77). The average annual estimated fishery-related mortality attributable to the Mid-Atlantic coastal gillnet fishery from 1997 to 2001 was two animals (CV=0.77) (Waring et al., 2003).

Gray Seal

The western North Atlantic population of gray seals occurs from New England to Labrador. There are two breeding concentrations in eastern Canada – one at Sable Island and one that breeds on the pack ice in the Gulf of St. Lawrence. There are several small breeding colonies on isolated islands along the coast of Maine and on outer Cape Cod and Nantucket Island in Massachusetts (Waring et al., 2003). The population estimate for the Sable Island and

Gulf of St. Lawrence breeding groups was 143,000 in 1993. The population in waters off Maine increased from about 30 in the early 1980s to between 500 and 1,000 animals in 1993 and between 1,500 and 1,700 in 2001 (Waring et al., 2003). The gray seal population in Massachusetts increased from 2,010 in 1994 to 5,611 in 1999, although it is not clear how much of this increase may be due to animals emigrating from northern areas. The minimum population size for gray seals is unknown.

Gray seals, like harbor seals, were hunted for bounty in New England waters until the late 1960s. The hunt may have severely depleted this stock in U.S. waters (Rough, 1995). In Canada, gray seals were hunted for several centuries by indigenous people and European settlers in the Gulf of St. Lawrence and along the Nova Scotia eastern shore, and were locally extirpated (Lavigueru and Hammill, 1993). By the mid-1900s, gray seals were considered to be rare, and in the mid-1960s, the population in eastern Canada was estimated to be 5,600 (Mansfield, 1966). Since the mid-1960s, the population has been increasing. During a bounty program (1976-1983) and a culling program (1967-1983), the average annual removals were 720 and 1,000 seals, respectively (Fisheries and Oceans Canada, 2001). Between 1993 and 2000, the annual kill of gray seals by hunters was: 1993 (0), 1994 (40), 1995 (364), 1996 (132), 1997 (72), 1998 (275), 1999 (98), and 2000 (342). The traditional hunt continued in 2002 and 2003, with 76 and 126 gray seals taken, respectively, off the Magdalen Islands and in other areas, except Sable Island, where commercial hunting is not permitted (Fisheries and Oceans Canada, 2003).

An unknown level of mortality also occurs in the mariculture industry (*i.e.*, salmon farming) and by deliberate shooting (NMFS, unpublished data). In addition, the Cape Cod stranding network has documented several animals with netting or plastic debris around their necks in the Cape Cod/Nantucket area. Between 1997 and 2001, 197 gray seal strandings were recorded, extending from Maine (25) to North Carolina (1). Most of the strandings were in Massachusetts (72), New York (55), and Maine (25). Twenty-three animals showed signs of human interactions: fishery (8), power plant (3), oil spill (6), shot (1), mutilated (1), boat strike (1), and other (3) (Waring et al., 2003). Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals that die or are seriously injured wash ashore, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery interaction.

Fisheries interactions with gray seals take place primarily in the Northeast multispecies sink gillnet fishery in the Gulf of Maine and in Southern New England. There were 47 gray seal mortalities observed in this fishery between 1993 and 2001. Based on observer data, the average annual estimated mortality and serious injury attributable to this fishery from 1997 to 2001 was 131 gray seals (CV=0.26) (Waring et al., 2003).

Harp Seal

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans and has been increasing off the East Coast of the United States from Maine to New Jersey. Harp seals are usually found off the U.S. from January to May, when the western stock of harp seals is at its most southern point of migration. The minimum population estimate for the western North

Atlantic is 5.2 million seals in Canada; present data are insufficient to calculate the minimum population estimate for U.S. waters (Waring et al., 2003).

A large number of harp seals are killed in Canada, Greenland, and the Arctic. For 2003 to 2005, the Canada Department of Fisheries and Oceans set the three-year total allowable catch (TAC) of harp seals at 975,000, with an annual TAC of up to 350,000 in any two years provided that the combined TAC over three years was maintained by a reduction in the TAC in the other years (Fisheries and Oceans Canada, 2003). In addition, annual harp seal mortalities in Greenland and the Arctic may exceed 100,000 (Waring et al., 2003). The commercial catches do not account for subsistence takes and animals that are killed but not landed (struck and lost) (Lavine, 1999). A recent analysis of the struck and loss rates suggests that the rate for young seals (majority of Canadian take) is less than 5 percent, while losses of older seals is higher (approximately 50 percent) (DFO, 2000).

From 1988 through 1993 strandings each year were under 50, approaching 100 animals in 1994, and exceeding 100 animals in 1995-1996 (Rubinstein 1994; Waring et al., 2003). In addition, in 1996, there was a stranding in North Carolina. From 1997 through 2001, 980 strandings were recorded, of which 50 percent (495) were in 2001 (Waring et al., 2003). Fifty-two percent (n=258) of the 2001 strandings were carcasses, and the remaining 49 percent were live strandings. Strandings were recorded from Maine (166) to North Carolina (1), and the highest numbers occurred in Massachusetts (339) and New York (277). Many were live strandings, but some seals were euthanized due to the animal's condition. Other sick and injured seals were transported to rehabilitation facilities, where some subsequently died. Few animals showed signs of human interactions and, except for 4 shot animals, 8 fishery interactions, 1 mutilated animal, 1 boat strike, and 1 ingested plastic, the interactions were classified as other (e.g., no signs of human interaction). Factors contributing to a dramatic increase in strandings in 2001 are unknown (Harris et al., 2002), but may indicate a possible shift in the stock's distribution or expansion southward into U.S. waters (Waring et al., 2003).

Recent bycatch has been observed by NMFS Sea Samplers in the Northeast multispecies sink gillnet fishery, but no mortalities have been documented in the Mid-Atlantic coastal gillnet, Atlantic drift gillnet, pelagic pair trawl, or pelagic longline fisheries (Waring et al., 2003). The majority of fisheries-related mortality in harp seals can be attributed to the Northeast multispecies sink gillnet fishery, which is based in the Gulf of Maine and in Southern New England. There were 122 observed harp seal mortalities between 1990 and 2001. For the period extending from 1997 to 2001, the average annual fishery-related mortality and serious injury to this stock from the Northeast multispecies sink gillnet fishery was estimated at 96 harp seals (CV=0.33) (Waring et al., 2003). Harp seal interactions with the Mid-Atlantic coastal gillnet fishery have been minimal since observer coverage began in 1993. No harp seals were taken on observed trips from 1993 to 1997 or from 1999 to 2001. One take was recorded in 1998. The average annual estimated fishery-related mortality attributable to this fishery between 1997 and 2001 was 3.0 harp seals (CV=1.02) (Waring et al., 2003).

9.4.2.5 Sea Turtles

The diverse life history of sea turtles leaves them susceptible to numerous threats on land, in the benthic environment, and in the pelagic environment. Natural threats to sea turtles include hurricanes, cold stunning, and biotoxin exposure. Of these natural risk factors, the sand accretion and rainfall associated with hurricanes can prove particularly destructive to sea turtle nests. In addition, waves generated from storm surges can result in extensive damage to sea turtle nesting habitat. For example, in 1992, all of the eggs over a 90-mile length of coastal Florida were destroyed by storm surges on beaches that were closest to the eye of Hurricane Andrew (Milton et al., 1994).

Anthropogenic factors that may affect turtle nesting habitat include beach erosion; beach armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants and an increased presence of native species (e.g., raccoons, armadillos, and opossums) that feed on turtle eggs. When sea turtles shift from the land environment to the pelagic and benthic marine environments, the principal anthropogenic threats they face originate from commercial fisheries and the threat of submersion and drowning from entanglement in commercial fishing gear. Additional anthropogenic threats to sea turtles in the marine environment include vessel collision and marine pollution (including the ingestion of marine debris).

The remainder of this section is divided into two parts:

- The first summarizes the major threats to each of the sea turtle species of concern, including a summary of interactions with ALWTRP regulated fisheries.

- The second discusses the significant actions taken or planned by NMFS and other agencies to mitigate the risks and rebuild populations of endangered and threatened sea turtles.

Exhibit 9A-2 in Appendix 9-A includes a list of fisheries using gillnet and trap/pot gear known or suspected to take sea turtles. The appendix also provides a summary of incidental take statements issued by NMFS for the take of sea turtles in those gillnet and trap/pot fisheries regulated under the ALWTRP (See Exhibit 9A-3, Appendix 9-A).[38]

[38] When NMFS' authorization of a Federally-regulated marine fishery is found to be consistent with Section 7(a)(2) – i.e., it is not likely to jeopardize the continued existence of an ESA-listed species – an incidental take statement (ITS) is issued in accordance with Section 7(b)(4) of the ESA that specifies the anticipated take of ESA-listed species that might occur as a result of the fishery action. Reasonable and Prudent Measures (actions to minimize the impacts (i.e., amount or extent) of take) are also provided and must be implemented in order for any takes that do occur to be in compliance with the ESA.

Kemp's Ridley Sea Turtle

Like other turtle species, the severe decline in the Kemp's ridley population seems to have been heavily influenced by a combination of exploitation of eggs and impacts from fishery interactions. From the 1940s through the early 1960s, Kemp's ridley nests were heavily exploited (USFWS and NMFS, 1992), but beach protection in 1966 helped to curtail this activity (USFWS and NMFS, 1992).

Natural threats to Kemp's ridley sea turtles include the destruction of nesting habitat from storm events, natural predators at sea, and oceanic events such as cold-stunning. Although cold-stunning can occur throughout the range of the species, the risk is likely to be greatest in the more northern habitats of Cape Cod Bay and Long Island Sound. For example, in the winter of 1999/2000, a major cold-stunning event stranded 218 Kemp's ridleys (as well as 54 loggerheads and five green turtles) on Cape Cod beaches (Still et al., 2002). Such events do not always occur at this magnitude; the extent of episodic major cold stun events may be associated with numbers of turtles utilizing Northeast waters in a given year, oceanographic conditions and the occurrence of storm events in the late fall. Although many cold-stunned turtles can survive if treated early enough, cold-stunning events can represent a significant cause of natural mortality. It is possible that strandings of Kemp's ridley turtles in some years have increased at rates higher than the rate of increase in the Kemp's ridley population (TEWG, 1998).

Currently, anthropogenic impacts to the Kemp's ridley population are similar to those faced by other sea turtle species. Takes of Kemp's ridley turtles have been recorded by sea sampling coverage in the Northeast otter trawl fishery, pelagic longline fishery, and southeast shrimp and summer flounder bottom trawl fisheries.

Following World War II, there was a substantial increase in the number of trawl vessels (particularly shrimp trawlers) in the Gulf of Mexico, where adult Kemp's ridley turtles tend to congregate. Information from fishermen helped to demonstrate the high number of turtles taken in these shrimp trawls (USFWS and NMFS, 1992). Subsequently, NMFS has worked with the industry to reduce turtle takes in shrimp trawls and other trawl fisheries, including the development and use of turtle excluder devices (TEDs).

The Turtle Expert Working Group's 2000 Assessment Update for the Kemp's ridley identifies growing concern over incidental takes by gillnet fisheries in the Federal nearshore and offshore waters of the mid- and southeast Atlantic. In particular, the shark gillnet fishery in Federal waters offshore of Georgia and Florida is under close observation for takes of Kemp's ridleys. Kemp's ridleys are also affected by other gillnet fisheries. In December 1999 the gillnet fishery for southern flounder in Pamlico Sound, North Carolina was closed to fishing for 30 days because of elevated levels of stranded Kemp's ridley and loggerhead turtles in inshore waters and the documentation of takes by the fishery (64 FR 70196).[39] As a result, on October 3, 2001, NMFS issued an interim final rule closing the waters of Pamlico Sound, North Carolina to fishing with gillnets with a mesh-size larger than 4 ¼ inch stretch mesh from September 28, 2001

[39] During November and December 1999, a total of 97 strandings occurred in the southeastern portion of Pamlico Sound. Kemp's ridley turtles accounted for 46 of the strandings; loggerhead turtles for 31 of the strandings; and green turtles for 19 of the strandings. The species of one of the turtles was not identified (66 FR 50350).

through December 15, 2001, to protect migrating sea turtles (66 FR 50350). This interim final rule, including the dates from September to December, was made permanent on September 6, 2002 (67 FR 56931). Offshore gillnet fisheries have also been implicated in sea turtle deaths. In the spring of 2000, a total of five Kemp's ridley carcasses were recovered from a North Carolina beach where 277 loggerhead carcasses were also found. The cause of death for most of the turtles recovered was unknown, but the mass mortality event was suspected to have been from a gillnet fishery operating offshore in the preceding weeks. In addition, four of the carcasses were found still carrying gillnet gear consistent with that used in the Federal monkfish fishery.[40] In response, on May 12, 2000, NMFS prohibited the use of gillnet gear with ≥ 6 inch stretched mesh for 30 days in coastal waters along eastern North Carolina, north of Cape Hatteras, and Virginia. In March 2002, NMFS published new restrictions for the use of gillnets with larger than 8 inch (20.3 cm) stretched mesh in Federal waters (3-200 nautical miles) off of North Carolina and Virginia; these restrictions were designed to reduce the potential impact of the monkfish and other gillnet fisheries on endangered and threatened species of sea turtles in areas where sea turtles are known to concentrate. These restrictions were initially published in an Interim Final Rule under the authority of the Endangered Species Act (67 FR 13098) and, subsequently, finalized on December 3, 2002, by a Final Rule that established the restrictions on an annual basis (67 FR 71895).

Although not the largest known source of anthropogenic mortality, Kemp's ridleys have been taken in both gillnet and crab pot fishing gear.[41] Manzella et al. (1988) estimated the relative impact of various types of fishing activities on juvenile Kemp's ridleys from tag returns of turtle strandings. They concluded that for juveniles caught by fishing, four percent were caught in gill nets and 0.2 percent by crab pots. Tag returns for adult turtles indicate that seven percent were caught in gill nets (Marquez et al., 1989).[42]

Strandings of Kemp's ridleys in Virginia indicate that they may also be susceptible to interactions with the state pound net fishery (NMFS, 2004a). A final rule published in May, 2004 (69 FR 24997), poses seasonal restrictions on the pound net fishery in the Chesapeake Bay during the times when these interactions are deemed to be highest, and continues reporting and monitoring requirements for this fishery.

Loggerhead Sea Turtle

Loggerhead sea turtles are affected by a variety of anthropogenic threats in the marine environment. These include oil and gas exploration, coastal development, marine pollution, underwater explosions, hopper dredging, offshore artificial lighting, power plant entrainment

[40] The majority of the turtles stranded in the 2000 event were loggerheads, but Kemp's ridleys were also documented. The timing of the multiple strandings coincided with the monkfish and dogfish offshore gillnet fisheries. For more information, see NMFS (2002a) in References section.

[41] The commercial shrimp trawling fishery is the largest source of anthropogenic mortality for Kemp's ridley sea turtles.

[42] This study was based exclusively upon the returns of tags from stranded tagged turtles. Causes of mortality for the larger number of untagged turtles were not examined.

and/or impingement, entanglement in debris, ingestion of marine debris, marina and dock construction and operation, boat collisions, poaching, and fishery interactions.

Loggerhead sea turtles originating from the western Atlantic are believed to lead a pelagic existence in the North Atlantic for as long as seven to 12 years before settling into benthic environments. During that period they are exposed to threats from a series of pelagic longline fisheries in the Atlantic Ocean and Mediterranean Sea, including tuna and swordfish longline fisheries from the United States, Central America, Spain, Italy, and Greece, among others (Lewison et al., 2004). Basin-wide average bycatch rates, extrapolated to account for total longline effort in the Atlantic and Mediterranean, yielded a minimum estimate of over 200,000 loggerheads caught in these waters in 2000 alone (Lewison et al., 2004). Though not all of these interactions would have been lethal, NMFS' estimate of 17 to 42 percent immediate and delayed post-hooking mortality rates for loggerheads (NMFS, 2001d) suggests thousands of potential turtle mortalities.

Aguilar et al. (1995) estimated that the Spanish swordfish longline fleet, which is only one of the many fleets operating in the region, captures more than 20,000 juvenile loggerheads annually (killing as many as 10,700). Observer records indicate that an estimated 6,900 loggerheads were captured by the U.S. fleet between 1992 and 1998, of which an estimated 43 were dead (SEFSC, 2001). For 1998 alone, an estimated 510 loggerheads were captured in this fishery.

Once loggerheads enter the benthic environment in waters off the coastal U.S., they are exposed to a suite of fisheries in Federal and State waters including trawl, purse seine, hook and line, gillnet, pound net, longline, and trap fisheries. Loggerhead sea turtles are captured in fixed pound net gear in Long Island Sound; in pound net gear and trawls in summer flounder and other finfish fisheries in the Mid-Atlantic and Chesapeake Bay; in gillnet fisheries in the Mid-Atlantic and elsewhere; and in scallop, monkfish, spiny dogfish, and Northeast sink gillnet fisheries. The nearshore and inshore gillnet fisheries in the Mid-Atlantic are of particular concern. Annual peaks in loggerhead strandings in this area regularly occur in early summer and late fall, coinciding with increased gillnet activity. Observers have documented lethal takes of both loggerheads and Kemp's ridleys in these fisheries (TEWG, 2000). Shrimp trawlers, however, represent the most significant source of incidental takes from commercial fisheries, and are believed to be the largest single source of mortality in southeastern U.S. waters. Magnuson et al. (1990) estimated 5,000 to 50,000 loggerheads killed each year by the offshore commercial shrimp fleet in the southeastern Atlantic and Gulf of Mexico (Magnuson et al., 1990). Subsequently, NMFS has worked with the industry to reduce turtle takes in shrimp trawls and other trawl fisheries, through the development and use of TEDs. In addition, NMFS published a proposed rule in October 2001 (66 FR 50148) and a final rule in February 2003 (68 FR 8456) to amend TED regulations and require a modified design in order to exclude leatherbacks and large, sexually mature loggerheads and green turtles. Despite this regulatory action, the shrimp trawl fishery is still anticipated to take thousands of loggerheads each year (NMFS, 2002b).

Based on strandings and observer reports, loggerheads are also susceptible to entanglements and impingements with gear used in the Virginia state pound net fishery (NMFS, 2004a). A final rule published in May 2004 (69 FR 24997) poses seasonal restrictions on the

pound net fishery in the Chesapeake Bay during the times when these interactions are deemed to be highest, and continues reporting and monitoring requirements for this fishery.

Leatherback Sea Turtle

Primary threats to leatherback sea turtles in the marine environment include poaching, fishing gear interactions, and marine debris. Leatherback sea turtles may be more susceptible to marine debris ingestion than other species due to their pelagic existence and the tendency of floating debris to concentrate in convergence zones in which adults and juveniles feed and migrate (Lutcavage et al., 1997; Shoop and Kenney, 1992). Investigations of the stomach contents of leatherback sea turtles revealed that a substantial percentage (44 percent of the 16 cases examined) contained plastic (Mrosovsky, 1981). Along the coast of Peru, intestinal contents of 19 of 140 (13 percent) leatherback carcasses were found to contain plastic bags and film (Fritts, 1982). The presence of plastic debris in the digestive tract suggests that leatherbacks might not be able to distinguish between prey items and plastic debris (Mrosovsky, 1981). Balazs (1985) speculated that the object may resemble a food item by its shape, color, size or even movement as it drifts about, and induce a feeding response.

Of the Atlantic turtle species, leatherbacks seem to be the most vulnerable to entanglement in fishing gear. This susceptibility may be the result of their body type (large size, long pectoral flippers, and lack of a hard shell), their attraction to the gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface, and perhaps their attraction to the lightsticks used to attract target species in longline fisheries. They are also susceptible to entanglement in gillnets (used in various fisheries) and to capture in trawl gear (e.g., shrimp trawls). Sea turtles entangled in fishing gear generally have a reduced ability to feed, dive, surface to breathe, or perform any other behavior essential to survival (Balazs, 1985). They may be more susceptible to boat strikes if forced to remain at the surface, and entangling lines can constrict blood flow, resulting in necrosis.

Among U.S. commercial fisheries, the southeast shrimp trawl fishery is known to take the highest number of leatherback sea turtles. Henwood and Stuntz (1987) estimated that the offshore commercial shrimp fleet captures about 640 leatherbacks annually in the southeastern U.S. Approximately 25 percent (160) of the captured animals die from drowning.[43] To address the fact that leatherbacks were too large to escape from TEDs, NMFS published a proposed rule in October 2001 (66 FR 50148), and a final rule in February 2003 (68 FR 8456) to amend the TED regulations in the Atlantic and Gulf Areas of the southeastern U.S. and to require a modified design in order to exclude leatherbacks and large, sexually mature loggerheads and green turtles.

The southeast shrimp trawl fishery is not the only trawl fishery that can interact with leatherback sea turtles. In October 2001, a Northeast Fisheries Science Center observer documented the take of a leatherback in a bottom otter trawl fishing for *Loligo* squid off of Delaware. These trawl fisheries do not use TEDs.

[43] The use of TEDs by the shrimp industry did not significantly reduce leatherback captures and mortality because TEDs are generally incapable of passing adult leatherbacks through the exit opening.

Leatherbacks are also exposed to pelagic longline fisheries in the Atlantic Ocean and Mediterranean Sea, such as tuna and swordfish longline fisheries from the United States, Central America, Spain, Italy, and Greece, among others (Lewison, et al., 2004). Basin-wide average bycatch rates, extrapolated to account for total longline effort in the Atlantic and Mediterranean, yielded a minimum estimate of over 50,000 leatherbacks caught in these waters in 2000 alone (Lewison, et al., 2004). Though not all of these interactions would have been lethal, NMFS' estimate of 8 to 27 percent immediate and delayed post-hooking mortality rates for leatherbacks (NMFS, 2001d) suggests thousands of potential turtle mortalities.

According to observer records, an estimated 6,363 leatherback sea turtles were caught by the U.S. Atlantic tuna and swordfish longline fisheries between 1992 and 1999, of which 88 were released dead. Since the U.S. fleet accounts for only five to eight percent of the hooks fished in the Atlantic Ocean, adding up the under-represented observed takes of the other 23 countries actively fishing in the area would likely result in annual take estimates of thousands of leatherbacks over different life stages.

Trap/pot gear used in several Atlantic fisheries poses another significant threat to leatherback sea turtles. In the Northeast, leatherbacks are known to become entangled in lobster trap/pot gear. From 1980 to 2000, 119 leatherback entanglements in lobster trap/pot gear were reported from New York through Maine; 65 of those entanglements occurred from 1995 to 2000 (NMFS, 2001a). Prescott (1988) found entanglements in fishing gear (primarily in lobster trap/pot lines) to be the primary cause of death in 51 of 57 adult leatherback strandings on Cape Cod, Massachusetts between 1977 and 1987. Data collected by the Sea Turtle Stranding and Salvage Network (STSSN) and NMFS also suggest that conch/whelk trap/pot gear was involved in a number of reported leatherback entanglements in Massachusetts and New Jersey waters (NMFS unpublished data, 2001).

The Mid-Atlantic blue crab fishery is another potential source of leatherback entanglement. In North Carolina, two leatherback sea turtles were reported entangled in a crab trap/pot buoy inside Hatteras Inlet (D. Fletcher, pers. comm., 1990). A third leatherback was reported entangled in a crab pot buoy in Pamlico Sound off of Ocracoke. This turtle was disentangled and released alive; however, lacerations on the front flippers from the lines were evident (D. Fletcher, pers. comm., 1989).

In the Southeast, leatherbacks are vulnerable to entanglement in Florida's lobster and stone crab trap/pot fisheries, as documented on stranding forms. In the U.S. Virgin Islands, where one in five leatherback strandings from 1982 to 1997 was due to entanglement (Boulon, 2000), leatherbacks have been observed with their flippers wrapped in the line of West Indian fish traps (R. Boulon, pers. comm., 2000).

Gillnet fisheries operating in the nearshore waters of the Mid-Atlantic states have also been known to capture leatherbacks when these fisheries and leatherbacks co-occur. However, there is very little quantitative data on capture rate and mortality. Data collected by the NEFSC Fisheries Observer Program from 1994 through 1998 (excluding 1997) indicate that a total of 37 leatherbacks were incidentally captured (16 lethally) during this period in drift gillnets set in offshore waters from Maine to Florida. Observer coverage for this period ranged from 54

percent to 92 percent. In North Carolina, a leatherback was reported captured in a gillnet set in Pamlico Sound at the north end of Hatteras Island in the spring of 1990 (D. Fletcher, pers. comm., 1990). It was released alive by fishermen after much effort. Five other leatherbacks were released alive from nets set in North Carolina during the spring months: one was from a net (unknown gear) set in the nearshore waters near the North Carolina/Virginia border (1985); two others had been caught in gillnets set off of Beaufort Inlet (1990); a fourth was caught in a gillnet set off of Hatteras Island (1993); and a fifth was caught in a sink net set in New River Inlet (1993). In addition to these, in September 1995 two dead leatherbacks were removed from a large (11-inch) monofilament shark gillnet set in the nearshore waters off of Cape Hatteras, North Carolina.

Strandings of leatherbacks in Virginia indicate that they may also be susceptible to interactions with the state pound net fishery (NMFS, 2004a). A final rule published in May 2004 (69 FR 24997) poses seasonal restrictions on the pound net fishery in Chesapeake Bay during the times these interactions are deemed to be highest, and continues reporting and monitoring requirements for this fishery.

Since many entanglements of this typically pelagic species likely go unnoticed, entanglements in fishing gear may be much more common than the available data suggest. In addition, many of the stranded leatherbacks for which a direct cause of death could not be documented showed evidence of rope scars or wounds and abraded carapaces, implicating entanglement.

Green Sea Turtle

In the western Atlantic, green sea turtles range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean, but are considered rare north of Cape Hattaras (Wynne and Schwartz, 1999). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and directed fisheries in the U.S. and throughout the Caribbean are largely to blame for the decline of the species. In the Gulf of Mexico, green turtles were once abundant enough in the shallow bays and lagoons to support a commercial fishery. However, declines in the turtle fishery throughout the Gulf of Mexico were evident by 1902 (Doughty, 1984).

In the continental United States, green turtle nesting occurs on the Atlantic coast of Florida (Ehrhart, 1979), with occasional nesting documented along the Gulf coast of Florida, at southwest Florida beaches, and at beaches on the Florida panhandle (Meylan et al., 1995). The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring, perhaps due to increased protective legislation throughout the Caribbean (Meylan et al., 1995). Increased nesting has also been observed along the Atlantic coast of Florida, on beaches where only loggerhead nesting was observed in the past. Recent population estimates for the western Atlantic area are not available.

As is the case for loggerhead and Kemp's ridley sea turtles, green sea turtles use Mid-Atlantic and northern areas of the western Atlantic coast as important summer developmental habitat. Like loggerheads and Kemp's ridleys, green sea turtles that use northern waters during the summer must return to warmer waters when water temperatures drop, or face the risk of cold

stunning.[44] Cold stunning of green turtles may occur in southern areas as well (i.e., Indian River, Florida), as these natural mortality events are dependent on water temperatures and not solely geographical location.

Green turtles face many of the same natural threats as loggerhead and Kemp's ridley sea turtles. In addition, green turtles appear to be susceptible to fibropapillomatosis, an epizootic disease producing lobe-shaped tumors on the soft portion of a turtle's body. Juveniles are most commonly affected. The occurrence of fibropapilloma tumors may result in impaired foraging, breathing, or swimming ability, leading potentially to death. Stranding reports indicate that between 200 and 400 green turtles strand annually along the Eastern U.S. coast from a variety of causes, most of which are unknown (STSSN database).

As with the other sea turtle species, fishery mortality accounts for a large proportion of annual human-caused mortality outside the nesting beaches, while other activities like dredging, pollution, and habitat destruction account for an unknown level of other mortality. Sea sampling coverage in the pelagic driftnet, pelagic longline, southeast shrimp trawl, and summer flounder bottom trawl fisheries has recorded takes of green turtles. Strandings of green turtles in Virginia indicate that they may also be susceptible to interactions with the state pound net fishery (NMFS, 2004a). A final rule published in May, 2004 (69 FR 24997), poses seasonal restrictions on the pound net fishery in Chesapeake Bay during the times these interactions are deemed to be highest, and continues reporting and monitoring requirements for this fishery.

Hawksbill Sea Turtle

The hawksbill sea turtle is relatively uncommon in the waters of the Northeast or Mid-Atlantic. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America, where they feed primarily on a wide variety of sponges and mollusks. There are accounts of small hawksbills stranded as far north as Cape Cod, Massachusetts. However, many of these strandings were observed after hurricanes or offshore storms. No fisheries-related takes of hawksbill sea turtles have been observed in the Northeast or Mid-Atlantic (NMFS, 2003c).

Olive Ridley Sea Turtle

The olive ridley turtles occur primarily in the Pacific, where they are occasionally taken by gillnet operations (NMFS, 1998b). Strandings on the U.S. east coast are rare and are restricted to southern Florida (NMFS, 2003f). No information exists on interactions between olive ridleys and Atlantic fisheries.

[44] Cold stunning refers to the condition observed in sea turtles that have been exposed to very sudden decreases in water temperature. Affected animals generally become lethargic and float to the surface. In extreme cases, death may occur.

Efforts to Reduce Sea Turtle Takes

Turtle Excluder Devices (TEDs) have been the primary tool used to reduce the number of takes resulting from shrimp trawling activities, the single largest source of sea turtle mortality, as well as trawls targeting summer flounder.[45] The TED is a grid of bars with an opening either at the top or the bottom. The grid is fitted into the neck of a shrimp trawl. Small animals like shrimp slip through the bars and are caught in the bag end of the trawl. Large animals such as turtles and sharks, when caught at the mouth of the trawl, strike the grid bars and are ejected through the opening. NMFS has been able to show that TEDs are effective at excluding up to 97 percent of sea turtles with minimal loss of shrimp. All shrimp trawlers operating in the Atlantic Area or Gulf Area are required to install a TED on each net that is rigged for fishing (50 CFR 223.206).[46]

TEDs afford larger turtles, such as leatherbacks, less protection than they offer other species. In light of this consideration, NMFS has used several alternative measures to protect leatherback sea turtles from lethal interactions with the shrimp fishery, including the establishment of a Leatherback Conservation Zone (60 FR 25260). NMFS established the zone to restrict, when necessary, shrimp trawl activities from off the coast of Cape Canaveral, Florida to the Virginia/North Carolina border. This action has allowed NMFS to quickly close the area or portions of the area on a short-term basis, when high concentrations of leatherbacks are present, to shrimp fishermen who do not use TEDs with an escape opening large enough to exclude leatherbacks.

Other emergency measures have also been used to minimize interactions between leatherbacks and the shrimp fishery. For example, in November 1999 parts of Florida experienced an unusually high number of leatherback strandings. In response, NMFS required shrimp vessels operating in a specified area to use TEDs with a larger opening for a 30-day period beginning December 8, 1999 (64 FR 69416). In addition, NMFS published an Advanced Notice of Proposed Rulemaking in April 2000 (65 FR 17852) indicating that the agency was considering proposing a rule to provide additional protection for leatherback turtles in the shrimp fishery. NMFS published the proposed rule in October 2001 (66 FR 50148) and a final rule in February 2003 (68 FR 8456); the rule amends TED regulations and requires a modified design in order to exclude leatherbacks and large, sexually mature loggerheads and green turtles.

To reduce the impact of large-mesh gillnet fisheries in the Mid-Atlantic, NMFS published a final rule in December 2002 (67 FR 71895) which enacted a seasonally adjusted gear restriction by closing portions of the Mid-Atlantic Exclusive Economic Zone (EEZ) to fishing with gillnets with a mesh size larger than 8-inch stretched mesh. Gillnets with mesh sizes larger than 8 inches are known to be more likely to catch sea turtles, and were the gear of choice in the historical sea turtle fishery.

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[45] For a complete list of TED-related regulatory actions passed to protect sea turtles, see http://www.nmfs.noaa.gov/prot_res/PR3/regulations.html (Viewed on March 6, 2004).

[46] Atlantic Area means all waters of the Atlantic Ocean south of 36 °33'00.8" N. lat. (the line of the North Carolina/Virginia border) and adjacent seas, other than waters of the Gulf Area, and all waters shoreward thereof, including ports (50 CFR 222.102).

Observations of entangled or impinged loggerhead turtles and strandings of Kemp's ridleys, leatherbacks, and green sea turtles in Virginia indicate that they can be susceptible to interactions with the state pound net fishery (NMFS, 2004a). A final rule published in May, 2004 (69 FR 24997), poses seasonal restrictions on the pound net fishery in Chesapeake Bay; these restrictions include prohibiting the fishery within certain areas and regulating the size of the leaders used in other areas at the times these interactions are deemed to be highest. This rule also continues reporting and monitoring requirements for the pound net fishery, and sets up a framework for expedited regulatory actions should such actions become necessary.

To respond to high levels of sea turtle takes in the Highly Migratory Species pelagic longline fishery in the Atlantic and Gulf of Mexico, an area closure and fishing gear experiment were enacted, which has led to the proposed implementation of circle hook, bait, and sea turtle release gear requirements (69 FR 6621).[47] These gear modifications are expected to reduce both the level of interactions between sea turtles and pelagic longline gear, and the post-hooking mortality for those interactions that do occur.

Recreational hook and line fishermen also pose an entanglement risk to sea turtles. NMFS conducts outreach to recreational fishermen, including a public information brochure with guidelines on what fishermen should do if a sea turtle is hooked or entangled.

Actions to protect sea turtles also include a Strategy for Sea Turtle Conservation and Recovery in Relation to Atlantic Ocean and Gulf of Mexico Fisheries (Sea Turtle Strategy), released by NMFS in June 2001. The Strategy addresses the incidental capture of endangered or threatened sea turtle species in state and Federal fisheries in the Atlantic and Gulf of Mexico. The major elements to the strategic plan include:

- Continuing and improving stock assessments for each stock/species of sea turtle found within the U.S. Exclusive Economic Zone (EEZ);
- Improving and refining estimation techniques for the takes of sea turtles to ensure that ESA criteria for recovery are being met;
- Continuing and improving the estimation or categorization of sea turtle bycatch by gear type and fishery;
- Evaluating the significance of incidental takes by gear type;
- Convening specialist groups to prepare take reduction plans for gear types with significant takes; and
- Promulgating ESA and MSA regulations implementing plans developed for take reduction by gear type.

[47] See also NMFS, 2004c in the References Section (Endangered Species Act - Section 7 Consultation Biological Opinion, Reinitiation of Consultation on the Atlantic Pelagic Longline Fishery for Highly Migratory Species).

The Sea Turtle Strategy is being implemented through the scoping process under the National Environmental Policy Act (66 FR 39474). In May 2004, NMFS announced the availability of a draft information framework and draft criteria for evaluating fishing gear with respect to the Strategy (69 FR 30627). Through scoping meetings, NMFS will convene working groups made up of experts from the states, Fishery Management Councils, industry, academic, and non-governmental organizations, and other interested parties to address and prepare take reduction plans for gear types with significant levels of incidental sea turtle takes. These requirements will likely extend to the lobster, other trap/pot, and gillnet fisheries affected by the ALWTRP; however, the nature and extent of the requirements has yet to be determined.

9.4.2.6 Summary of Commercial Fishing Interactions Affecting Other Protected Species

As described above, the stocks of other whales, porpoises, dolphins, sea turtles, and seals whose ranges overlap with ALWTRP-regulated fisheries have been and continue to be affected by various anthropogenic risk factors. Exhibit 9-9 summarizes the current major interactions with commercial fisheries for each species, the past, present, and reasonably foreseeable future actions taken to reduce incidental takes in these fisheries, and the overall effect of these actions.

Exhibit 9-9

SUMMARY OF COMMERCIAL FISHING INTERACTIONS AFFECTING OTHER PROTECTED SPECIES [1]

Species	Major Sources of Mortality from Commercial Fisheries (as described in the MMPA LOF)	Magnitude of Impact from ALWTRP-Regulated Gear	Major Past, Present and Reasonably Foreseeable Future Actions (PPRFFAs) [2]	Effect of PPRFFAs
Blue Whale Sei Whale Sperm Whale	• No significant sources at this time	Low	In 1996, sperm whales were considered under the AOCTRT for HMS fisheries. NMFS has implemented some of the AOCTRT recommendations through the HMS FMP. No further specific actions are planned for these species at this time; however, these species could benefit from ALWTRP measures and other RFFAs intended to protect other marine mammals.	Reduced Entanglement Risk
Harbor Porpoise	• Northeast sink gillnet • Mid-Atlantic coastal gillnet	Moderate	The HPTRP was published on December 1, 1998, and became effective on January 1, 1999. The Plan regulates gillnet operations from the Gulf of Maine to the Mid-Atlantic region.	Reduced Entanglement Risk
WNA Coastal Bottlenose Dolphin	• Mid-Atlantic coastal gillnet • Southeastern U.S. Atlantic shark gillnet • Southeast Atlantic gillnet	Moderate	The BDTRP was published on April 26, 2006, and became effective on May 26, 2006. The plan is designed to reduce incidental takes in the Mid- and South Atlantic regions.	Reduced Entanglement Risk
Atlantic White-sided Dolphin	• Northeast and Mid-Atlantic bottom trawl • Northeast and Mid-Atlantic mid-water trawl (including pair trawl)	Low	NMFS established the Atlantic Trawl Gear Take Reduction Team (ATGTRT) in September 2006 to address the incidental mortality and serious injury of white-sided dolphins, among other protected species, in the Northeast and Mid-Atlantic bottom trawl and Northeast and Mid-Atlantic mid-water trawl (including pair trawl) fisheries. The ATGTRT is charged with developing a take reduction plan to reduce bycatch of these species.	Reduced Entanglement Risk

Exhibit 9-9

SUMMARY OF COMMERCIAL FISHING INTERACTIONS AFFECTING OTHER PROTECTED SPECIES [1]

Species	Major Sources of Mortality from Commercial Fisheries (as described in the MMPA LOF)	Magnitude of Impact from ALWTRP-Regulated Gear	Major Past, Present and Reasonably Foreseeable Future Actions (PPRFFAs) [2]	Effect of PPRFFAs
Risso's dolphin	• Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline (Atlantic portion) • Northeast sink gillnet	Low	The NE sink gillnet fishery is currently regulated under the ALWTRP. Takes from commercial fisheries do not exceed PBR for this species at this time, thus no RFFAs are currently planned. Though not a focal species, this species may benefit from a Take Reduction Team process that will result in the development of a take reduction plan for the Atlantic large pelagics longline fishery.	Reduced Entanglement Risk
Spotted Dolphin (Atlantic and Pantropical)	• Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline (Atlantic portion)	Low	Takes from commercial fisheries do not exceed PBR for this species at this time, thus no RFFAs are currently planned. Though not a focal species, this species may benefit from a Take Reduction Team process that will result in the development of a take reduction plan for the Atlantic large pelagics longline fishery.	Reduced Entanglement Risk
Striped Dolphins	• Northeast and Mid-Atlantic bottom trawl • Northeast and Mid-Atlantic mid-water trawl (including pair trawl)	Low	Takes from commercial fisheries do not exceed PBR for this species at this time, thus no RFFAs are currently planned. Though not a focal species, this species may benefit from a Take Reduction Team process that will result in the development of a take reduction plan for Atlantic trawl fisheries.	Reduced Entanglement Risk
Pilot Whale Common Dolphin	• Northeast and Mid-Atlantic bottom trawl • Northeast and Mid-Atlantic mid-water trawl (including pair trawl) • Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline (Atlantic portion)	Low	In 1996, these species were considered under the AOCTRT for HMS fisheries. NMFS has implemented some of the AOCTRT recommendations through the HMS FMP. Recent byctach information indicates takes of these species in Atlantic trawl and pelagic longline fisheries does not exceed PBR. NMFS has established new Take Reduction Teams to develop take reduction plans to reduce the incidental mortality and serious injury to pelagic delphinids in the Atlantic large pelagics longline fishery and Atlantic trawl fisheries.	Reduced Entanglement Risk

Exhibit 9-9

SUMMARY OF COMMERCIAL FISHING INTERACTIONS AFFECTING OTHER PROTECTED SPECIES [1]

Species	Major Sources of Mortality from Commercial Fisheries (as described in the MMPA LOF)	Magnitude of Impact from ALWTRP-Regulated Gear	Major Past, Present and Reasonably Foreseeable Future Actions (PPRFFAs) [2]	Effect of PPRFFAs
Harbor Seal	• Northeast sink gillnet • Mid-Atlantic coastal gillnet	Low	Takes from commercial fisheries do not exceed PBR for this species at this time, thus no RFFAs are currently planned.	No Known Effect
Gray Seal	• Northeast sink gillnet	Low	PBR for this species is unknown at this time. However, fishery-related mortality for this stock is considered to be low relative to population size, thus no RFFAs are currently planned.	No Known Effect
Harp Seal	• Northeast sink gillnet • Mid-Atlantic coastal gillnet	Low	Takes from commercial fisheries do not exceed PBR for this species at this time, thus no RFFAs are currently planned.	No Known Effect
Kemp's ridley Sea Turtle[3] Loggerhead Sea Turtle[3] Leatherback Sea Turtle[3] Green Sea Turtle[3] Hawksbill Sea Turtle[3, 4] Olive Ridley Sea Turtle[3, 4]	• Otter trawl (targeting shrimp and summer flounder) • Mid-Atlantic coastal gillnet • Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline (Atlantic portion)	Moderate	Turtle Excluder Devices (TEDs) have been the primary tool to reduce takes by otter trawls in shrimp and summer flounder trawling activities, the greatest source of sea turtle mortality. Mid-Atlantic coastal gillnet mesh size is currently regulated under a seasonally adjusted gear restriction to reduce turtle takes, and a May, 2004 final rule enacts seasonal restrictions to reduce incidental turtle mortality in the Virginia pound net fishery. Previous HMS pelagic longline fishery area closures have led to the July, 2004 implementation of circle hook, bait, and turtle release gear requirements for this fishery. In addition, these fisheries may also be subject to future regulations under a new strategic sea turtle conservation plan, released by NMFS in June, 2001.	Reduced Entanglement Risk

Notes:

[1] Sources of mortality as found in Waring et al., 2000; Waring et al., 2002; and Waring et al., 2003.
[2] Fishery Management Plans: Positive effects have also resulted from the implementation of various management actions for fisheries that interact with protected species. Reductions in entanglement risk have indirectly resulted from measures such as time/area closures and effort reductions (e.g., days-at-sea allocations, trip limits).
[3] Sources of mortality differ for each species (i.e., Kemp's ridleys are not taken in longline fishery).
[4] No fisheries-related takes of hawksbill sea turtles have been observed in the Northeast or Mid-Atlantic (NMFS, 2003c); likewise, no information exists on takes of olive ridley sea turtles in the Northeast or Mid-Atlantic.

9.4.3 Affected Fisheries

Chapter 4 identifies twelve major fisheries affected by the regulatory alternatives and provides a basic description of each fishery, including current regulations, landings, revenue, number of permitted vessels, and key ports. This section adds a more detailed history of Federal management for each fishery. Each section begins with a summary of available data on landings, revenue, and vessel activity in the fishery of interest. This is followed by a chronological discussion of major Federal management actions associated with each fishery, and the circumstances that led to these actions. Each section includes a review of the evolving status of the fishery and a summary of any reasonably foreseeable future actions for that fishery. The information presented in this section is based primarily on fishery management plans prepared by the National Marine Fisheries Service and fishery management councils, including the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (MAFMC), the South Atlantic Fishery Management Council (SAFMC), and the Atlantic States Marine Fisheries Commission (ASMFC).

In addition to regulations stemming from the MSA, many fisheries are also subject to additional regulations resulting from the protection of the nine species previously mentioned that are protected either by the ESA of 1973 or the MMPA of 1972. Following the management history for each fishery, a final section includes a brief summary of additional regulations, if any, resulting from significant interactions with these protected species.

9.4.3.1 American Lobster

The commercial lobster fishery is the most economically important fishery along the Atlantic coast. The ex-vessel value of American lobster landings totaled approximately $251 million in 2001, accounting for 21 percent of Atlantic coast commercial fishing revenue and 37 percent of New England revenue. More than 3,300 vessels held Federal permits to fish for lobster during the 2001 fishing year (a fishing year extends from May 1 to April 30). These vessels employ a variety of gear, but traps/pots, the use of which is regulated under the ALWTRP, account for the majority of lobster landings.

Management History

Management of the lobster fishery by individual states began as early as the 1870s and continued through much of the 1900s. In the early 1970s, the weakness of this fragmented management system became evident, as lobster landings declined and the lobster fishery showed signs of collapse. It was clear that a more coordinated management system was needed, making the lobster fishery one of the first targeted for Federal management. In 1983, the Federal government approved the first Federal lobster fishery management plan (FMP).

Despite having a Federal FMP, uniform regulation across states remained a problem. For example, although states received the Federal FMP in 1978, some states had still not implemented the FMP's recommended minimum carapace measures in 1983 when the final FMP was approved. A second shortcoming of the Federal FMP stemmed from its geographic limitation to lobster fishing only in the Exclusive Economic Zone. With approximately 80 percent of lobstering activity occurring in state waters, the Federal FMP objectives of maintaining a sustainable fishery and preventing overfishing could not be effectively achieved without including state waters in the management program. This issue was resolved with the passage of the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act) in 1993. The Atlantic Coastal Act represents a new and innovative approach to coordinated management of fisheries along the Atlantic coast, providing a mechanism to ensure Atlantic coastal state compliance with mandated conservation measures in Commission-approved fishery management plans. This legislation provided the foundation to transfer lobster management from the federally-oriented New England Fishery Management Council to the Atlantic States Marine Fisheries Commission (ASMFC).

New information on the status of the lobster resource became available through a 1996 stock assessment conducted jointly by state and Federal scientists. The assessment, which represented an analysis of lobster stocks through 1994, concluded the American lobster resource was overfished as a result of a dramatic increase in fishing effort, and declared the resource vulnerable to collapse throughout the range of the species. The panel believed that "the risk of stock collapse would be contained or reduced if the fishing effort were capped or reduced, and legal size increased." Following this assessment, the Atlantic States Marine Fisheries Commission in 1997 approved Amendment 3 to the Interstate Fishery Management Plan (ISFMP).

Amendment 3 created seven lobster management areas (LMAs) covering U.S. waters from Maine to North Carolina (see Exhibit 4-1). The management measures implemented under Amendment 3 included regulations protecting ovigerous females, trap size restrictions, escape vent size increases, trap tag requirements, and requirements for permits and licensing. In addition to these requirements, trap limits were implemented for all state and Federal lobster permit holders, reducing the maximum trap allocation over a three year period from 1,200 down to 800 traps per vessel for nearshore management areas (except Long Island Sound), and 1,800 traps per vessel for the offshore management area. These schedules were designed to control fishing effort, end overfishing, and begin the rebuilding of American lobster stocks.

Through Amendment 3, the ASMFC also established seven Lobster Conservation Management Teams (LCMT) charged with the development of management programs for each LMA. During the fall of 1998, the seven LCMTs developed and submitted management proposals for each LMA to the Commission's American Lobster Management Board (Board). The Board subsequently approved the proposals for incorporation into Amendment 3 in two phases:

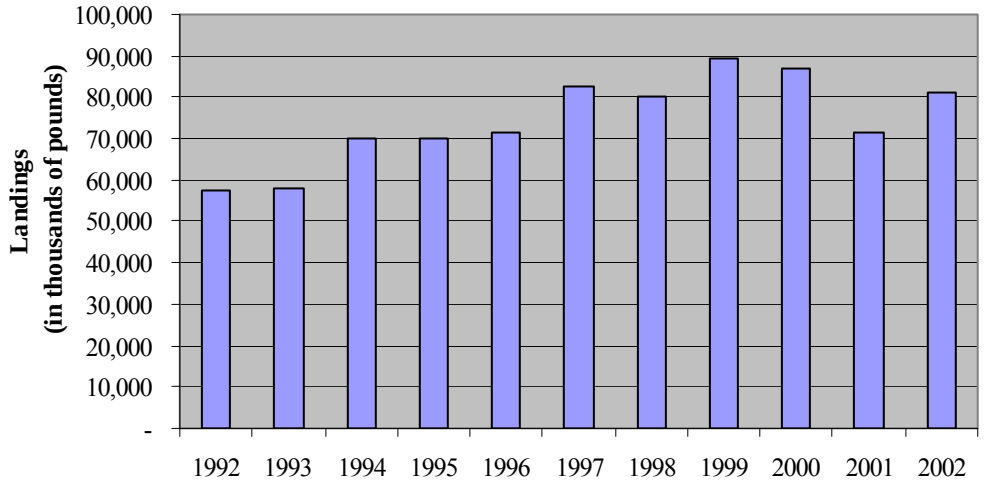
- **Addendum I (adopted in 1999)**: Addendum I incorporated recommendations from LCMT proposals directed at effort control, including the establishment of trap limits for LMAs 3, 4, 5, and 6 based on historical participation levels.

- **Addendum II (adopted in 2001)**: Addendum II incorporated recommendations from LCMT proposals directed at rebuilding lobster egg production levels. In addition, Addendum II detailed a trap reduction schedule for LMA 3, scheduled to take place over four years.[48]

Despite the warning articulated in the 1996 stock assessment and the new regulations implemented under Amendment 3 and Addenda 1 and 2, lobster landings continued to increase throughout the 1990s. Since 1997, lobster landings have remained steady at approximately 82 million pounds a year, peaking in 1999 at 89 million pounds (Exhibit 9-10). At the same time as scientific advice suggested that the lobster fishery was overfished, lobster landings achieved record levels.

Exhibit 9-10

LOBSTER LANDINGS 1992-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

The Commission initiated an updated stock assessment in 1999 in an effort to clarify the biological assessment of the lobster resource. The updated stock assessment, completed in March 2000, supported previous assessments of the vulnerability of the lobster resource as a result of increasing levels of fishing effort throughout the species range. In addition, the 2000 stock assessment declared the lobster resource "growth" overfished, according to the overfishing

[48] Each LMA 3 trap allocation of greater than 1,200 traps will be reduced on the basis of a sliding scale. Trap allocations in such cases will not go below a baseline of 1,200 traps. LMA 3 trap allocations of less than 1,200 traps will remain at their initial qualifying level and will not be permitted to increase. For more detailed information, see Addendum II to Amendment 3 to the Interstate Fishery Management Plan, available at http://www.asmfc.org/americanLobster.htm.

definition provided in the 1997 ISFMP.[49] Growth overfishing describes a fishery in which the maximum yield is not being produced because of high fishing mortality effects on smaller lobsters. Recruitment overfishing, in contrast, describes a fishery in which the number of new lobsters available to the fishery each year is reduced by high fishing mortality rates. The 2000 stock assessment concluded that the lobster resource did not exhibit signs of recruitment overfishing, a condition believed to be much more serious and a precursor to stock depletion and stock collapse.

The Board initiated development of Addendum III in August 2001. Addendum III incorporated new measures designed to meet the recommended $F_{10\%}$ outlined in the updated stock assessment by 2008.[50] Measures implemented include minimum and maximum gauge sizes and mandatory v-notching in LMAs 1 and 3.

In 1999, a mass mortality incident in the Long Island Sound area brought new challenges to the management of the lobster fishery. Beginning in October 1999, a number of fishing operations in the Western Long Island Sound area reported hauling traps containing an unusual number of dead or lethargic American lobsters. Reports of similar incidents increased in number and geographic scope into November and December, until roughly 60 percent of the Sound was reporting mass lobster mortality events. On January 26, 2000, the U.S. Secretary of Commerce declared the Long Island Sound (LIS) lobster die-off a fishery resource disaster. Following this declaration, the U.S. Congress approved a $13.9 million emergency appropriation to address the biological and economic consequences of the fishery disaster. Using this emergency appropriation, NMFS allocated $7.3 million for the economic relief of LIS fishermen and communities dependent on the LIS lobster fishery. The remaining $6.6 million was used to establish a comprehensive research effort into the possible causes of the mass mortality event in the LIS area.

Since 1999, lobster landings in New York, Connecticut, and Rhode Island have fallen significantly, from approximately 17 million pounds in 1998 and 1999 to 7 million pounds in 2002. In February 2003, the ASMFC took emergency action to increase the minimum gauge size for lobsters in LMA 2 on an accelerated time scale and initiated action to rebuild the lobster stock in Area 2 through the development of Addendum IV. Addendum IV was approved in December 2003.

The primary measures outlined in Addendum IV for LMA 2 established a multi-state effort control program for LMA 2, including a limited entry program and individual trap limits based on historic participation, a prohibition on the issuance of new LMA 2 permits, a conservation tax for all trap transfers, and new minimum gauge sizes.

Addendum IV also incorporated an accelerated trap reduction program and a transferable trap program for Area 3. This program allows Area 3 lobster fishermen to transfer traps to other

[49] For assessment purposes, the lobster population is split into three regions: Gulf of Maine (GOM), Georges Bank and South (GBS), and South of Cape Cod to Long Island Sound (SCCLIS). The quality and quantity of data do not currently permit the lobster population to be assessed at a greater level of detail.

[50] $F_{10\%}$ is the fishing mortality rate that will keep the spawning stock biomass at a level that will produce 10% of the eggs that a non-fished population would produce.

lobster fishermen. Along with other measures, the LMA 3 transferability program established an overall trap cap of 2,600 traps in LMA 3 and a two-tiered conservation tax (10 percent or 50 percent) on the purchase of transferable traps, with the higher conservation tax applied for transferring traps when the purchaser owned more than 2,100 traps.

Addendum V, approved by the ASMFC in March 2004, amended the overall trap cap for LMA 3 set by Addendum IV based on comments gathered at public hearings expressing concern that the overall trap cap of 2,600 may be too high. Addendum V includes an LMA 3 overall trap cap of 2,200 traps, with the higher conservation tax imposed when the purchaser owns more than 1,800 traps.

Addendum VI, approved by the ASMFC in February 2005, replaces two of the LMA 2 effort control measures of Addendum IV: permits and the historic participation eligibility period. No new LMA 2 permits will be distributed after December 31, 2003. In addition, to qualify for an LMA 2 permit endorsement, a permit holder must document landings between January 1, 1999 and December 31, 2003.

Addendum VI also suspended implementation of a previously approved effort control plan for Area 2 specified in Addendum IV. Prior to implementation of the LMA 2 effort control plan, it became apparent that the plan was ineffective at controlling trap growth over current levels. The specific problems identified in the plan were two-fold: the aggregate allocations were too liberal – far beyond the recent levels fished – and the individual trap allocation criteria were considered arbitrary. In early 2005, the ASMFC began the development of Addendum VII. The ASMFC directed all jurisdictions with LMA 2 permit holders to work with the LMA 2 industry to modify components of the effort control plan so that all jurisdictions will be capable of implementing the plan specifics and to ensure that it will not allow effort to increase if and when the resource recovers in LMA 2.

Addendum VII, approved by the ASMFC in November 2005, established a multi-state effort control program for LMA 2 to cap effort (traps fished) at recent levels (2001-2003) and allow adjustments in traps based on future stock conditions. The current LMA 2 plan attempts to capture the attrition from the fishery caused by the stock decline, thereby preventing a return of overall fishing levels to the historic highs of the late 1990's. The addendum also rescinded the LMA 2 minimum gauge increases approved in Addendum IV.

Based on recommendations from a peer-reviewed stock assessment in January 2006, the ASMFC approved Addendum VIII in May 2006. Addendum VIII establishes new biological reference points to determine the stock status of the American lobster resource. This addendum also expands the mandatory coast-wide monitoring and reporting requirements of the Interstate FMP to improve the ability of scientists and managers to assess and manage the lobster fishery.

The ASMFC approved Addendum IX in October 2006. Addendum IX establishes a conservation "tax" on a program that permits the transfer of trap allocations between holders of LMA 2 permits. The tax imposes a 10 percent passive reduction in traps on each transfer event. Thus, for every 100 trap tags transferred, 10 will be retired, and the overall cap on traps in LMA 2 will be reduced accordingly.

The ASMFC approved Addendum X in February 2007. Addendum X establishes consistent monitoring and reporting criteria for the lobster fishery and is designed to improve understanding of the productivity of the lobster resource. Beginning January 1, 2008, it will require reporting on landings by all lobster dealers, as well as reporting on landings and vessel activity by a minimum of 10 percent of active harvesters, with the expectation that, in time, 100 percent of license holders will report. Federal regulations implementing Addendum X have yet to be proposed. Until Federal regulations are made final, the impact of Addendum X will be limited to modification of state regulations.

Regulations to Reduce Incidental Takes of Protected Species

The lobster trap/pot fishery in the Gulf of Maine and Mid-Atlantic is listed as a Category I fishery due to interactions with marine mammals, particularly the endangered North Atlantic right whale. The lobster fishery was regulated under the first ALWTRP, which went into effect in 1997 as an Interim Final Rule (62 FR 39157). The regulations contained in this rule were updated in February 1999, and again in December of 2000. In January 2002, NMFS modified the ALWTRP and published three rules that (1) mandate further modifications to commercial fishing gear; (2) establish a system for restricting fishing in areas where unexpected aggregations of right whales are observed; and (3) establish restricted areas based on annual, predictable aggregations of right whales. The action considered here will represent the fifth modification of regulations under the ALWTRP for the lobster fishery.

In addition to regulations implemented under the ALWTRP, it is possible that the lobster fishery will be made subject to future regulations promulgated under the Strategy for Sea Turtle Conservation and Recovery in Relation to Atlantic Ocean and Gulf of Mexico Fisheries (Sea Turtle Strategy). In June 2001, NMFS released a strategic plan to address the incidental capture of endangered or threatened sea turtle species in state and Federal fisheries in the Atlantic and Gulf of Mexico, including Kemp's ridley, loggerhead, and leatherback sea turtles. The general strategy is to address sea turtle bycatch by gear type. Based on species distribution and foraging patterns, Kemp's ridley sea turtles are not likely to interact with lobster gear. In contrast, loggerhead and leatherback turtles have been known to become entangled in lobster trap/pot gear; however, the level of observed take is not expected to appreciably reduce the likelihood of both the survival and recovery of either sea turtle species (NMFS, 2001a).

9.4.3.2 Northeast Multispecies

Commercial fishing vessels landed a total of 111.6 million pounds in the multispecies groundfish fishery in the Northeastern U.S. in 2002. Of the total landings, 11.3 million pounds (ten percent) were caught using gear that is potentially subject to the requirements of the ALWTRP. Approximately 12 percent of the fishery's $113.7 million revenue is attributable to fish caught with ALWTRP-regulated gear. In the 2002 fishing year, about 400 vessels (9.9 percent) held Northeast multispecies permits that indicated ALWTRP-regulated gear (gillnets, pots/traps) as the primary gear type.

Management History

The Northeast Multispecies Fishery Management Plan (Groundfish FMP) governs commercial fishing in New England and Mid-Atlantic waters for fifteen species (and 24 stocks) of demersal fish. These species are grouped together under one FMP and managed by the New England Fishery Management Council (the Council) because the fish share common habitats and are often caught at the same time. For a complete description of these species, see Chapter 4.

During the late 1980s, a dramatic increase in the number and size of fishing vessels, deployment of bigger gear, and the development of electronic aids such as fishfinders and navigation equipment contributed to greater efficiencies and intensity in the groundfish fishery. The result was a precipitous drop in landings during the 1980s and a complete collapse of the fishery in the early 1990s, when annual landings reached the lowest levels ever recorded.

Initial Federal efforts at managing the groundfish fishery included annual and quarterly catch quotas for cod, haddock and yellowtail flounder; quota allocations by vessel class; and trip limits. The quota and trip limits imposed during the inception of the Groundfish FMP led to frequent fishery closures affecting one or more segments of the fishing fleet. This form of management frequently imposed economic hardship on the industry, thereby eroding support for the management measures. This in turn led to widespread misreporting and non-reporting by the industry as a way to circumvent the regulations.

Starting in the early 1980s, a new management program was implemented through the 1982 Interim Fishery Management Plan. This plan, and the next several groundfish actions (through Amendment 4 in 1991) managed the groundfish fishery (now expanded to include 13 species) primarily through seasonal closures and minimum mesh and fish size restrictions. These measures, however, proved inadequate, as the condition of the resources, especially cod, haddock and yellowtail flounder, continued to decline to record low levels.

To end overfishing and address the severe decline in the groundfish resource as well as the continuing influx of more and larger vessels to the fishery, the Council developed Amendment 5 to the FMP. This action, which became effective in 1994, implemented a moratorium on permits as well as an effort-control program that reduced a vessel's days-at-sea allocation by 50 percent over a five- to seven-year period. Amendment 5 became the first action to restrict both access and effort in the groundfish fishery. The FSEIS for Amendment 5 determined that this action might have significant effects on a substantial number of small entities, specifically those vessels less than 45 feet, which, at the time, accounted for 36 percent of the qualified vessels.

Despite the severity of the measures implemented in Amendment 5, stocks continued to decline and a "Special Advisory" was issued by the Northeast Fisheries Science Center in 1994 stating that Amendment 5 was "too little too late." In December 1994, NMFS implemented an emergency action to close, on a year-round basis, three large areas (Closed Area I, Closed Area II, and the Nantucket Lightship Closed Area) to all vessels capable of catching groundfish while the Council developed a new plan, Amendment 7 to the Groundfish FMP.

Framework 9, implemented in 1995, extended the 1994 emergency action permanently. In addition, Framework 9 also prohibited all small mesh fisheries in the Gulf of Maine, Georges Bank, and Southern New England Regulated Mesh Areas, unless it could be determined that the fishery had a bycatch rate of less than five percent for regulated groundfish species.

Amendment 7, implemented in 1996, represented the most comprehensive program in a ten-year long sequence of management actions designed to rebuild and manage the Northeast multispecies fishery. Building on the management system implemented in Amendment 5, Amendment 7 implemented controls on the number and size of vessels that may fish for regulated multispecies, accelerated the Amendment 5 days-at-sea (DAS) effort-reduction schedule, and placed new restrictions on the size of the fish that can be caught. In addition, Amendment 7 expanded the five percent bycatch rule established in Framework 9 to include a prohibition on all non-DAS fisheries, further reducing the bycatch of groundfish regulated species. These actions have had a positive impact on the status of several species of groundfish, especially in the Georges Bank area, and landings have increased as a result. Similar to Amendment 5, the FSEIS for Amendment 7 concluded that the proposed action would have significant impacts on a substantial number of small entities in the short term. Projected reductions in overall revenues ranged from ten to 25 percent in the first three years.

Following Amendments 7 and 9, NMFS has approved several framework adjustments implementing further restrictions on the groundfish fishery. Frameworks 20, 24, 25, 26, 27, 30, 31, and 33 all implemented additional management measures to protect, in particular, the Gulf of Maine cod stock. These measures included new Gulf of Maine seasonal and year-round closures, gillnet effort-reduction measures (including limits on the number of allowable nets), and adjustments of the Gulf of Maine cod trip limits.

In August 2002, NMFS implemented interim management measures as a result of the Federal Court decision in the case of Conservation Law Foundation, et al. V. Evans, et al. The suit alleged that Framework Adjustment 33 violated the overfishing, rebuilding, and bycatch provisions of the MSA and Amendment 9 to the Fishery Management Plan by approving groundfish catch levels that were too high and risked further depletion of groundfish populations. On March 1, 2002, NMFS submitted to the Court a proposed remedy to bring the FMP into full compliance with the SFA, the Magnuson-Stevens Act and all other applicable law as quickly as possible. The Settlement Agreement provides protection to the Northeast multispecies fishery while NMFS, the Council, and the public develop long-term measures to comply with the SFA and other applicable laws. Significant new management measures implemented under the 2002 interim final rule include:

- a freeze of DAS at the highest annual level used during fishing year 1996-2000 and a 20 percent reduction from that level;
- increased gear restrictions for certain gear types;
- modifications and additions to the closed areas; and
- limits on yellowtail flounder catch.

Following implementation of the interim final rule, NMFS published two emergency actions that extended the interim final rule until the final rule implementing Amendment 13 took effect on May 1, 2004 (see below).

Amendment 13

On January 29, 2004, NMFS published proposed regulations to implement measures included in Amendment 13 to the Northeast Multispecies FMP, the final phase of the Settlement Agreement described above. The principal objectives of the amendment include rebuilding overfished stocks, ending overfishing, reducing bycatch, and minimizing the impact of the fishery on fish habitat and protected species. The public comment period for this rule ended on February 27, 2004 (69 FR 4362). Full implementation of the final rule for Amendment 13 occurred on May 1, 2004.

At the heart of Amendment 13 are the proposed rebuilding programs for overfished stocks of the groundfish fishery. Amendment 13 relies on DAS allocations (the time available to be fished) to reduce fishing mortality to targeted levels.

Under Amendment 13, a vessel's DAS allocation is first divided into two classes: used DAS, referred to as "effective effort," and unused DAS. A vessel's level of "effective effort" is calculated as the maximum DAS used by that vessel in any single fishing year from qualifying fishing years 1996 through 2001. Qualifying years include only those in which the vessel landed a total of 5,000 pounds or more of regulated groundfish species. Unused DAS is equal to the difference between a vessel's Amendment 7 DAS allocation and a vessel's level of "effective effort." Since the implementation of the DAS mechanism in Amendment 5, a large portion of the total number of allocated DAS were not used. Such unused DAS is known as "latent effort" and represents potential future fishing effort. Amendment 13 takes actions to reduce unused DAS to ensure that gains made in rebuilding overfished stocks are not lost as a result of the future use of unused DAS. Once effective effort is calculated, a vessel's Amendment 13 DAS is divided into three categories:

- Category A — effective DAS available for use;
- Category B — effective DAS that can only be used to target "healthy" groundfish stocks identified by NMFS; and
- Category C — latent (unused) DAS, equal to the difference between a vessel's Amendment 7 DAS allocation and its number of effective DAS.

Upon implementation of Amendment 13, all Category B and C DAS were placed in a reserve account for each vessel. Category A DAS are available to fish for any groundfish species. In fishing years 2004 and 2005, the DAS allocation was limited to 60 percent of effective effort, or 60 percent of the total Category A DAS allocation. Under the terms of Amendment 13, Category B DAS may only be used to target "healthy stocks" as designated by the Council. As rebuilding occurs, the ratio of Category A to Category B DAS may be adjusted, and Category C DAS may be allowed back into the fishery subject to a conservation tax.

In fishing years 2006 through 2008, Category A DAS will be further limited to 55 percent of effective effort, and in 2009, Category A DAS will be limited to 45 percent of effective effort. These default measures may be adjusted based on stock conditions.

The limits on Category A DAS reduced the number of DAS that can be fished on any stock from about 71,000 in fishing year 2003 to about 41,000 in fishing year 2004, a reduction of approximately 42 percent. Actual use in 2003 was 42,118 DAS, and actual use in fishing year 2004 was 32,973 DAS.

In addition to the changes in DAS allocations, Amendment 13 included the following significant measures:

- Continuing the current year-round closures in Closed Area I, Closed Area II, the Western Gulf of Maine, Cashes Ledge, and Nantucket Lightship Closed Areas, along with rolling closures;
- Implementing additional areas closed to bottom tending mobile gear to protect EFH;
- Increasing the Gulf of Maine cod trip limit;
- Decreasing the Georges Bank cod trip limit;
- Modifying seasonal yellowtail flounder trip limits;
- Continuing gear restrictions implemented in August 2002 with some modifications. Gear restrictions implemented under Amendment 13 included an increase in mesh size for trawl and gillnet gear, a reduction in the number of gillnets that can be fished, and a removal of the restriction on the number of trip gillnets in the Gulf of Maine and Georges Bank; and
- Continuing commercial minimum fish sizes implemented in August 2002, when the cod minimum size was increased.

On May 1, 2006, NMFS implemented an Emergency Interim Final Rule to further reduce the fishing mortality rate for specific groundfish species, prevent overfishing, and maintain the rebuilding program of the FMP (71 FR 19348). The emergency action included differential DAS counting and reduced trip limits for specific species, among other provisions. In addition, the action continued two programs that would have expired on April 30, 2006: the DAS Leasing Program and a modified Regular B DAS Program on Georges Bank. These changes were largely made permanent through Framework Adjustment 42, implemented November 22, 2006 (71 FR 62156). Principally, Framework 42 focuses on two measures: (1) stricter trip limits on species of flounder, white hake, and Gulf of Maine cod; and (2) a system of differential DAS counting for gillnet vessels. Under the differential counting system, one DAS counts as two for inshore areas in the Gulf of Maine and the offshore areas of Southern New England and the Mid-Atlantic. Other measures implemented under Framework 42 include:

- Continuation of the DAS leasing program;
- Continuation of the Regular B DAS Program (expanded to include all areas, not just Georges Bank);
- Mandatory use of Vessel Monitoring Systems (VMS) for all groundfish vessels; and
- Approval of the Fixed Gear Sector on Georges Bank.

Regulations to Reduce Incidental Takes of Protected Species

Of the gear types typically used to catch multispecies finfish, sink gillnets have resulted in the greatest number of listed cetacean takes. Data indicate that gillnet gear has seriously injured right, humpback and fin whales by hampering mobility and feeding, causing chafing injuries, or by drowning. As a result, the Northeast (multispecies) sink gillnet fishery and the Mid-Atlantic coastal gillnet fishery are both listed as Category I fisheries.

The Northeast multispecies fishery was regulated under the first ALWTRP, which went into effect in 1997 as an Interim Final Rule (62 FR 39157). The regulations contained in this rule were updated in February 1999 and again in December of 2000. In January 2002, NMFS modified the ALWTRP and published three rules that (1) mandate further modifications to commercial fishing gear; (2) establish a system for restricting fishing in areas where unexpected aggregations of right whales are observed; and (3) establish restricted areas based on annual, predictable aggregations of right whales. The action considered here will represent the fifth modification of regulations under the ALWTRP for the Northeast multispecies fishery.

The Harbor Porpoise Take Reduction Plan (HPTRP) prohibits the setting of gillnets in certain areas for selected time periods. This includes a prohibition on the use of large mesh gillnet gear west of 72°30' in southern Mid-Atlantic waters (Maryland, Delaware, Virginia and North Carolina) from February 15 through March 15. Although the prohibition is meant to prevent harbor porpoise takes in gillnet gear, it should also be of benefit to sea turtles by reducing gillnet effort off of North Carolina during this time period, when sea turtles are present.

9.4.3.3 Monkfish

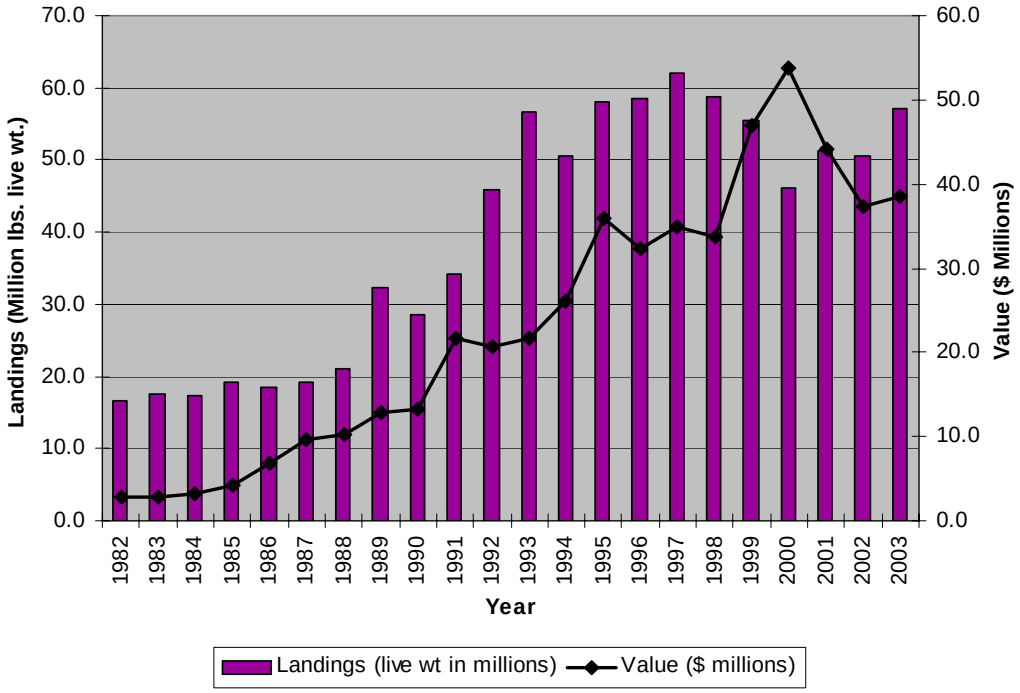
Roughly 50 million pounds of monkfish were landed in the Northeastern U.S. in 2002. Fixed or staked gillnets were used to catch the greatest percentage of monkfish, 58 percent (about 27.7 million pounds), followed by otter trawls at 41 percent. The ex-vessel value of monkfish landings in the Northeast totaled approximately $37 million in 2002. During the 2002 fishing year, a total of 647 vessels (approximately 22.7 percent of all monkfish vessels) held permits that indicated ALWTRP-regulated gear as their primary gear.

Management History

Recent U.S. landings of monkfish have increased dramatically in response to an increase in the market value of the species in combination with a decline in the abundance of traditional New England species. Significant commercial landings of monkfish were not recorded until the late 1970s to 1980s, when they averaged four thousand metric tons per year. Landings doubled from these levels in the late 1980s to approximately 10,000 metric tons, then increased dramatically throughout the 1990s, with annual landings reported at over 26,000 metric tons from 1995 to 1997.[51] As Exhibit 9-11 indicates, the increase in landings was spurred in part by an increase in the market price for monkfish, reflecting an increase in market demand for this species. The correlation between landings and price per pound was even stronger in the emerging market for monkfish livers. Between 1982 and 1995, annual monkfish liver landings rose from 0.02 to 1.10 million pounds as the monkfish liver price jumped from $1.00 to $5.00 per pound.

Exhibit 9-11

MONKFISH LANDINGS AND EX-VESSEL REVENUES 1982 - 2003



Source: NMFS, 2004b.

The status of the monkfish resource was re-assessed by the 23rd Stock Assessment Workshop (1997). This assessment concluded, "[t]he stock [was] at low levels of biomass and [was] over-exploited." The report highlighted the continuing trend of fewer large fish that had

[51] Most landings (80 percent) come from incidental catch in the groundfish and scallop fisheries.

been observed in recent trawl surveys and in the commercial catch. It also highlighted the decline in the calculated egg production level, which it attributed to a decline in the number of large fish in the population. Based on this evidence, it was recommended that the Council take measures to reduce fishing mortality throughout the species' range and prevent any redirection of displaced effort from other fisheries, which would diminish the prospects of rebuilding the stock. Under the Magnuson-Stevens Fishery Conservation and Management Act of 1976, the results of the 1997 stock assessment required the Council to prepare and submit an FMP by September 30, 1998, that would stop overfishing and rebuild the monkfish stock within ten years or less.

To meet the requirements of the MSA, the Council developed an FMP to stop overfishing within four years of implementation (2002) and promote rebuilding to the biomass targets within ten years (2009). The final Monkfish FMP (64 FR 54732), effective in November 1999, relies primarily on the implementation of a series of annual days-at-sea allocations over four years to reach these objectives. The plan allocates 40 days-at-sea to all vessels that qualify for a limited access permit in Years 1, 2, and 3 (1999-2001). Unless these allocations and other restrictions on size limits and bycatch stop overfishing and achieve the annual rebuilding mortality rates, no days-at-sea will be allocated in Year 4 (2002) or subsequent years of the FMP. To control the level of effort, the management program also applies trip limits to all monkfish days-at-sea.

The Council's Monkfish Monitoring Committee (MMC) conducted a review of the status of the fishery during Year 3 of the FMP. The MMC review process began in Fall 2001, utilizing the most recent stock assessment results, landings data, and resource survey data to evaluate the status of the fishery. The MMC concluded that the condition of the monkfish resource was improving, and recommended that the Council develop a framework action to extend for one year the existing 40 DAS management measures (Framework 1 to the Monkfish FMP). However, NMFS rejected Framework 1 because it did not comply with the fishing mortality rate threshold specified in the original plan. In order to take into account the improved status of the fishery, NMFS issued an emergency action to amend the Monkfish FMP, incorporate the results of the most recent stock assessments, and extend the 40 DAS measures as recommended by the MMC. NMFS approved this emergency rule in May 2002, which allowed the fishery to reopen for the remainder of the 2002 fishing year (i.e., through April 30, 2003). In the 2003 fishing year, the DAS limit remained at 40.

Amendment 2 to the Monkfish FMP incorporated updated scientific information into monkfish overfishing definitions, rebuilding targets, and management measures designed to rebuild stocks to maximum sustainable levels by 2009. Amendment 2 also reduced the overall complexity of the FMP; updated related environmental impact documents; considered modifications to the limited entry program for vessels fishing south of the North Carolina/Virginia border; and updated the plan's Essential Fish Habitat components. The final rule implementing Amendment 2 was published on April 28, 2005 (70 FR 21927) and took effect on May 1, 2005. In accordance with Amendment 2, the target TAC for FY 2006 was set at 7,737 metric tons for the Northern Fishery Management Area (NFMA), and 3,667 metric tons for the Southern Fishery Management Area (SFMA). This action also adjusted trip limits and restricted use of DAS for vessels fishing in the SFMA. The trip limits for the SFMA were reduced to 550 pounds (tail weight) per DAS for limited access Category A, C, and G vessels, and 450 pounds (tail weight) per DAS for limited access Category B, D, and H vessels. DAS usage was restricted to 12 monkfish DAS, plus carryover, for vessels fishing in the SFMA.

The 2006 NEFMC Monkfish Stock Assessment and Fishery Evaluation (SAFE) Report reviewed the status of the monkfish resource and found that monkfish are overfished in both the northern and southern areas (NEFMC/MAFMC, 2006). In part as a response to this finding, the NEFMC in October 2006 enacted Framework 3 of the Monkfish FMP (71 FR 19348), establishing maximum incidental catch levels for monkfish while fishing for northeast groundfish. Effectively, this action prohibited vessels from using B-days (as defined in the Northeast Multispecies FMP) to catch monkfish with no limit. In addition, in 2007, the NEFMC expects to take final action on Framework 4 of the Monkfish FMP. Framework 4 contains a revised method for establishing TACs, and uses this method to establish target TACs of 5,000 metric tons and 5,100 metric tons for the NFMA and SFMA, respectively, for the final three years of the rebuilding plan (FY 2007-FY 2009), unless otherwise modified by the MMC. The proposed target TAC for the NFMA is 35 percent lower than the target TAC in effect for FY 2006, and 67 percent lower than the average of target TACs in effect since FY 2002. The proposed target TAC for the SFMA is 39 percent higher than the target TAC in effect for FY 2006, but is 33 percent lower than the average of the target TACs in effect since FY 2002.

Regulations to Reduce Incidental Takes of Protected Species

The monkfish fishery is a component of the Northeast sink gillnet fishery and Mid-Atlantic coastal gillnet fishery, both of which are listed as Category I fisheries. The preceding discussion of the multispecies gillnet fishery also covers the protected species regulations affecting the monkfish fishery.

In addition, to reduce the impact of large-mesh gillnet fisheries in the Mid-Atlantic, NMFS published a final rule in December 2002 (67 FR 71895) which enacted a seasonally adjusted gear restriction by closing portions of the Mid-Atlantic Exclusive Economic Zone (EEZ) to fishing with gillnets with a mesh size larger than 8-inch stretched mesh. Gillnets with mesh sizes larger than 8 inches are known to be more likely to catch sea turtles, and were the gear of choice in the historical sea turtle fishery.

9.4.3.4 Spiny Dogfish

A total of 4.6 million pounds of spiny dogfish were landed in the Northeastern U.S. in 2002. Of the total landings, 1.8 million pounds (39 percent) were caught using gear managed under the ALWTRP. The ex-vessel value of spiny dogfish landings in the Northeast totaled $0.9 million in 2002, 40 percent of which came from fish caught with ALWTRP-regulated gear. A total of 815 vessels (26.7 percent) holding spiny dogfish permits in FY2002 indicated ALWTRP-regulated gear (predominantly gillnets) as the primary gear.

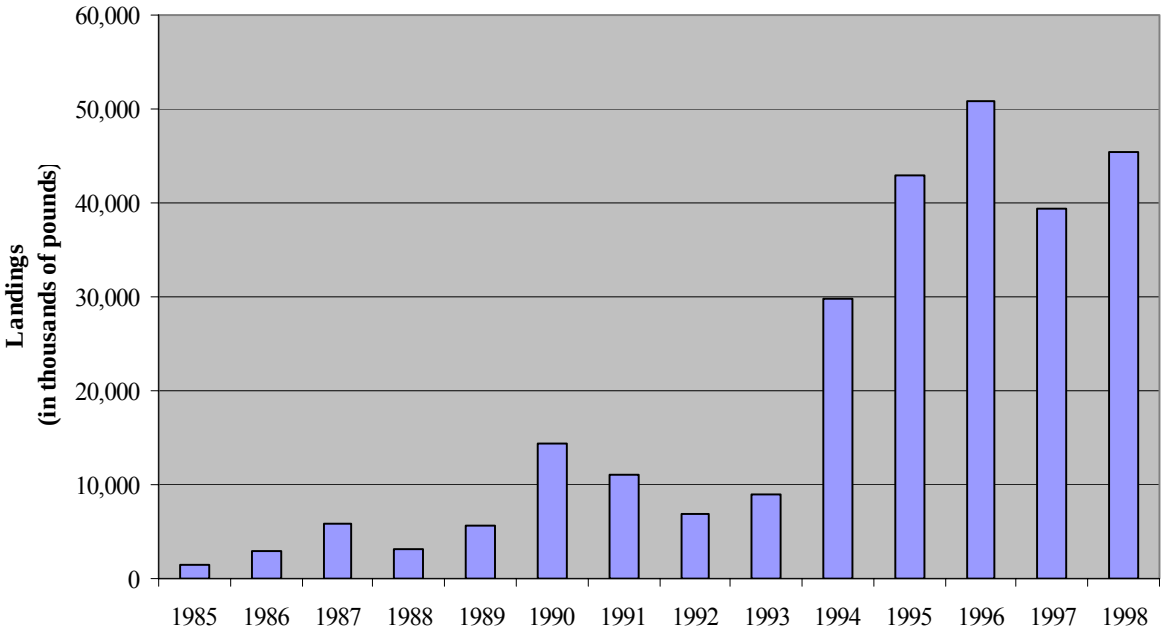
Management History

For most of the first two decades of extended jurisdiction under the MSA, the spiny dogfish was considered to be an "under-utilized" species of relatively minor value to the

domestic fisheries of the U.S. East Coast. With the decline of the traditional groundfish catch, an increase in directed fishing for dogfish resulted in a nearly ten-fold increase in landings from 1987 to 1996 (Exhibit 9-12).

Exhibit 9-12

SPINY DOGFISH LANDINGS 1985-1998



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

The lack of any regulations pertaining to the harvest of spiny dogfish in the U.S. EEZ combined with the recent rapid expansion of the domestic fishery led the Mid-Atlantic and New England Fishery Management Councils (Councils) to develop a management plan for the species. The recent fishery expansion in combination with the removal of a large portion of the adult female stock has resulted in the species being designated as overfished (NEFSC, 1998).

Initial management actions to regulate the spiny dogfish fishery began in 1998 with the approval of a draft Spiny Dogfish FMP developed by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC). The final rule was approved by NMFS on September 29, 1999 and became effective on April 3, 2000. The FMP specifies a coastwide target fishing mortality rate of F = 0.03, which translates to an initial quota of four million pounds. The annual quota is split on a semi-annual basis, with Period I extending from May 1 through October 31 and Period II from November 1 through April 30. To control the level of effort, the management program also imposes possession limits of 600 and 300 pounds for Periods I and II, respectively.

In recent years, there has been a shift in the spiny dogfish fishery from an offshore fishery to an inshore fishery. In 1998, state water landings accounted for 67 percent of total spiny dogfish landings. Given this trend, the Federal FMP's objective of rebuilding the spiny

dogfish resource could not be achieved without addressing fishing effort in state waters. In June 1999, the Atlantic States Marine Fisheries Commission (ASMFC) convened a Spiny Dogfish and Coastal Shark Management Board (Board) to begin development of an interstate fishery management plan. The Board took emergency action in August 2000 to close the spiny dogfish fishery in state waters when there is a closure in Federal waters. The intent of the emergency action was to:

- prevent the overharvest of the spiny dogfish fishery;
- prevent the unregulated portion of the spiny dogfish fishery in state waters from undermining the Federal FMP; and
- provide additional time for the ASMFC to develop the interstate spiny dogfish FMP, which would provide a framework for managing the fishery in state waters.

On November 21, 2002, the ASMFC approved the Interstate Fishery Management Plan for the Spiny Dogfish with an implementation date of May 1, 2003. The FMP complements the existing Federal regulations and adopts the target and threshold fishing mortality rates specified in the Federal plan.

Since 2003, the Federal FMP has maintained a spiny dogfish quota of 4 million pounds. In state waters, the ASMFC reduced the initial 8.8 million pound quota set in 2003-2004 to 4.4 million pounds; the following year, the quota was reduced to 4 million pounds. The TAC limits specified for 2006 maintained the limits established for 2005. In addition, the FMPs were modified in 2006 (Framework 1 for the NEFMC/MAFMC FMP and Addendum 1 for the ASMFC FMP) to allow annual specifications to remain in effect for up to 5 years.

The most recent stock assessment report for spiny dogfish (approved January 2007) indicates that the species is no longer overfished and that overfishing is not occurring. This has prompted the ASMFC to raise the state waters quota to 6 million pounds annually through 2009. Fifty-eight percent of this quota is allocated to the New England states, while the remaining 42 percent is allocated to waters from New York south through North Carolina.

Regulations to Reduce Incidental Takes of Protected Species

The spiny dogfish fishery is a component of the Northeast sink gillnet fishery and Mid-Atlantic coastal gillnet fishery, both of which are listed as Category I fisheries. The preceding discussion of the multispecies gillnet fishery covers the protected species regulations affecting the spiny dogfish fishery.

9.4.3.5 Directed Shark

In the Atlantic Ocean, the directed shark fishery is most active in southern waters. In 2002, roughly 675,000 pounds of shark were caught with ALWTRP-regulated gear in the

southeast. In the Northeast, 261,538 pounds (45 percent of the region's total) were caught using ALWTRP-regulated gear.[52] As of October, 2003, 610 vessels possessed permits to fish for shark, 251 of which were directed, and only six of which are known to use gillnets.[53]

Management History

In 1993, NMFS implemented the FMP for Sharks of the Atlantic Ocean. The Shark FMP included the management of 39 frequently caught species of Atlantic sharks separated into three groups for assessment and regulatory purposes: large coastal sharks (LCS), small coastal sharks (SCS), and pelagic sharks. Through the results from the 1992 stock assessment, NMFS classified LCS as overfished and SCS and pelagic sharks as fully fished. Management measures in this first FMP included commercial quotas for LCS and pelagic sharks, a recreational trip limit, the prohibition of "finning," and the establishment of a data collection system through mandatory trip reports, a fishery observer program, and commercial and recreational permitting requirements. Commercial quotas under the FMP were set at 2,436 metric tons and 580 metric tons for LCS and pelagic sharks, respectively. These quotas were divided into two equal half-year quotas, from January 1 through June 30 and from July 1 through December 31.

A number of problems arose in the initial year of the Shark FMP. The January to June LCS quota was exceeded shortly after implementation of the FMP, leading to the closure of that fishery on May 10, 1993. The LCS fishery was re-opened on July 1 with an adjusted quota to compensate for the overage in the first period. Within one month, the quota for the second period had been reached and the LCS fishery was closed again. To address this problem, a commercial trip limit of 4,000 pounds for LCS permitted vessels was implemented on December 29, 1993, and a control date for the Atlantic shark fishery was established on February 22, 1994. In addition, the LCS quota was increased to 2,570 metric tons based on a new stock assessment completed in 1994.

In June 1996, NMFS convened another stock assessment to examine the status of LCS stocks. The 1996 stock assessment found no clear evidence that LCS stocks were rebuilding and concluded "that recovery is more likely to occur with reductions in effective fishing mortality rate of 50 [percent] or more." In response to this information, in April 1997, NMFS reduced the LCS commercial quota by an additional 50 percent to 1,285 metric tons, and established a commercial quota for SCS of 1,760 metric tons.

On May 2, 1997, the Southern Offshore Fishing Association (SOFA) and other commercial fishermen and dealers sued NMFS over the April 1997 regulations. The Court found that NMFS "failed to conduct a proper analysis to determine the [April 1997 LCS] quota's economic effect on small businesses." The Court directed NMFS "to undertake a rational consideration of the economic effects and potential alternatives to the 1997 [LCS] quotas" on

[52] This estimate is based on an analysis of dealer data provided by the Northeast Regional Office, National Marine Fisheries Service.

[53] Based on information found in the 2004 Stock Assessment and Fishery Evaluation Report for Atlantic Highly Migratory Species and Amendment 1to the FMP for Atlantic Tunas, Swordfish, and Sharks.

small businesses engaged in the Atlantic shark commercial fishery. In May 1998, NMFS completed its economic review of the 1997 LCS quota. It concluded that the quotas might have had a significant impact on a substantial number of small entities. However, the report declared that no other viable alternatives were available that would both mitigate these economic impacts and ensure the viability of LCS stocks.

In 1997, NMFS initiated the development of new rebuilding plans for overfished LCS stocks, incorporating updated overfishing definitions and a new LCS stock assessment. The 1998 stock assessment found that the LCS stocks remained overfished and could not be rebuilt under the 1997 harvest levels. In April 1999, NMFS replaced the 1993 FMP with a new management plan entitled the "Highly Migratory Species (HMS)" FMP. Significant measures implemented in the 1999 HMS FMP, published on May 28, 1999, include:

- reduced commercial quotas for LCS and SCS;
- the establishment of ridgeback and non-ridgeback subgroups within the LCS fishery;
- minimum fish sizes for ridgeback LCS;
- establishment of blue shark, porbeagle shark, and other pelagic shark subgroups within the pelagic shark fishery;
- commercial quotas for the new pelagic shark subgroups; and
- an expansion of the list of prohibited shark species.

On June 25, 1999, SOFA et al. sued NMFS again, challenging the commercial measures implemented in the HMS FMP. A settlement agreement was reached between the two parties and required, among other things, an independent review of the 1998 LCS stock assessment. The results of the independent review, completed in July 2001, found that the scientific conclusions and management recommendations reached in the 1998 stock assessment were not based on scientifically reasonable uses of appropriate fisheries stock assessment techniques and the best available biological fishery information relating to LCS. In light of this information, NMFS implemented an emergency rule for the 2002 fishing year suspending certain measures of the 1999 regulations and maintaining the 1997 LCS commercial quota (1,285 metric tons) and the 1997 SCS commercial quota (1,760 metric tons).

In May and October 2002, NMFS announced the availability of new stock assessments for the SCS and LCS stocks, respectively. The stock assessment found that: (1) the LCS complex is overfished and overfishing is occurring; (2) sandbar sharks are not overfished but overfishing is still occurring; (3) blacktip sharks are rebuilt and healthy; (4) the SCS complex, Atlantic sharpnose, bonnethead, and blacknose sharks are healthy; and (5) finetooth sharks are

not overfished but overfishing is occurring.[54] Per the settlement agreement, the 2002 LCS stock assessment was peer reviewed, which found the assessment consistent with the best available science and that the appropriate stock assessment models had been used.

On November 14, 2003, NMFS published the Notice of Availability of the Final Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks (Amendment 1) in the Federal Register (68 FR 74746). The final rule for Amendment 1 was published on December 24, 2003, and required, among other things: aggregating the large coastal shark complex; using maximum sustainable yield as a basis for setting commercial quotas; eliminating the commercial minimum size; establishing regional commercial quotas and trimester commercial fishing seasons; implementing updated gear restrictions; and establishing a time/area closure off the coast of North Carolina. Most of these regulations took effect on February 1, 2004.[55] The new commercial quotas for each group within the Atlantic shark fishery are provided in Exhibit 9-13, along with the previous (i.e., before Amendment 1) commercial quotas. An economic review of the changes in these quotas found minimal impacts on affected Atlantic shark vessels fishing the LCS and SCS stocks, and no impact on vessels fishing for pelagic sharks.

Exhibit 9-13

AMENDMENT 1 AND BASELINE QUOTAS FOR THE ATLANTIC SHARK FISHERY

Management Unit	Quota (metric tons)	Previous Quota (metric tons)
Large Coastal Sharks	1,017	1,285[1]
Pelagic Sharks	853	853[2]
Small Coastal Sharks	454	1,760[1]

Notes:
[1] LCS and SCS quotas adopted in 1997.
[2] Pelagic shark quota adopted under the 1999 HMS FMP.

Source: NMFS, 2003d.

Following promulgation of Amendment 1, NMFS took steps to consolidate the FMP for Atlantic Tunas, Swordfish, and Sharks with the Atlantic Billfish FMP. The draft of this new FMP was released in August of 2005. After extensive public comment, the new FMP – identified as the Consolidated Atlantic Highly Migratory Species (HMS) FMP – became law in July of 2006. In addition to consolidating its predecessor FMPs, the HMS FMP implements several new requirements, including mandatory safe handling and release workshops for

[54] The determination that a stock is overfished is based on whether the size of the biomass is above its threshold (defined in the fishery FMP), and the determination of whether overfishing is occurring is based on whether the fishing mortality rate is below its threshold (defined in the fishery FMP).

[55] The change in commercial quotas, removal of commercial minimum sizes, and the establishment of regional quotas became effective on December 30, 2003. The North Carolina area/time closures and trimester seasons came into effect on January 1, 2005.

operators of longline and gillnet vessels, as well as species identification workshops for shark dealers.

Regulations to Reduce Incidental Takes of Protected Species

The Southeast U.S. Atlantic shark gillnet fishery under the HMS FMP is listed as a Category II fishery. This fishery is currently subject to regulations under the Atlantic Large Whale Take Reduction Plan (ALWTRP).

Current ALWTRP regulations include measures such as a closure of the Southeast U.S. right whale critical habitat and adjacent area (approximately Savannah, GA to Sebastian, FL) to all driftnet gillnet gear in the restricted area during the calving season (November 15 - March 31); special provisions for fishing with strikenet gear in the restricted area during the calving season; a 100 percent observer requirement from November 15 to March 31 in the observer area; and gear marking requirements.

Historic HMS fisheries that affect marine mammals also include the pelagic longline, pair trawl, and pelagic driftnet fisheries for Atlantic tunas, sharks, and swordfish. In 1996, the Atlantic Offshore Cetacean Take Reduction Team (AOCTRT) was formed to address marine mammal interactions with these fisheries. AOCTRT submitted a draft plan to reduce takes resulting from the gear associated with these fisheries, but the draft plan was not finalized. Instead, several protective measures were implemented through the HMS FMP. In particular, NMFS has prohibited the use of pair trawls and swordfish driftnets in Atlantic pelagic fisheries, and has implemented several other AOCTRT recommendations for the pelagic longline and shark gillnet fisheries.

In 2003, the SEFSC released an updated estimate of marine mammal and sea turtle bycatch in the pelagic longline fishery. This report indicated that the incidental take of the common dolphin and the long-finned pilot whale (strategic stock) in the Atlantic pelagic longline fishery may be occurring at levels that exceed Potential Biological Removal (PBR) for both species (Garrison, 2003). As a result of these findings, NMFS has convened an Atlantic Longline Take Reduction Team. The TRT held its initial meeting in June of 2005 (70 FR 36120). In addition, the NMFS Southeast Regional Office recently concluded that the HMS pelagic longline fishery is likely to jeopardize the continued existence of leatherback sea turtles (NMFS, 2004c). Therefore, NMFS is proposing bycatch mitigation measures throughout the pelagic longline fishery that include mandatory pelagic longline circle hook and bait requirements and mandatory possession and use of onboard equipment to reduce sea turtle bycatch mortality (69 FR 6621).

The HMS fishery is also subject to the Bottlenose Dolphin Take Reduction Plan (April 26, 2006, 71 FR 24776). Takes in the HMS fishery have been documented for both bottlenose dolphins and sea turtles.

9.4.3.6 Coastal Migratory Pelagic Species

The Coastal Migratory Pelagic Species Fishery is based primarily in waters off the southeastern United States. In 2002, a total of about 2.3 million pounds of Coastal Migratory Pelagic FMP-managed species were caught with gear managed under the ALWTRP (gillnets). During the 2002 calendar year, 3,269 vessels possessed permits to fish for coastal migratory pelagic species.[56]

Management History

The Fishery Management Plan (FMP) for the Coastal Migratory Pelagic Resources of the Gulf of Mexico and South Atlantic includes the management of several species: king and Spanish mackerel, little tunny, bluefish (in the Gulf of Mexico only), and cobia. The first FMP (1983) treated king and Spanish mackerel each as one U.S. stock, and divided commercial quotas for each stock by gear: gillnet, and hook and line. Under Amendment 1, implemented in September 1985, the king mackerel stock was separated into the Atlantic and Gulf migratory groups; under Amendment 2, implemented in July 1987, the Spanish mackerel stock was also separated into Atlantic and Gulf migratory groups. During this time, only the Gulf migratory groups of king and Spanish mackerel were declared overfished.

Between 1983 and 2004, the FMP for the Coastal Migratory Pelagic Species Fishery was amended 15 times. A history of significant actions is included below:

- **Amendment 1 (1982)**. Significant provisions implemented in Amendment 1 include: a downward revision of the king mackerel maximum sustainable yield (MSY); recognition of separate Atlantic and Gulf migratory groups for king mackerel; establishment of fishing permits; establishment of bag limits for king mackerel; elimination of commercial allocations among gear users; and the division of the Gulf commercial allocation for king mackerel into eastern and western zones for the purpose of regional allocation.

- **Amendment 2 (1985)**. Amendment 2 focused on Spanish mackerel stocks, implementing measures revising the Spanish mackerel MSY downward, recognizing two migratory groups for Spanish mackerel, and setting commercial quotas and bag limits.

- **Amendment 3 (1989)**. Amendment 3 prohibited drift gillnets for coastal pelagics and purse seines for the overfished groups of mackerel.

- **Amendment 4 (1989)**. Amendment 4 reallocated Spanish mackerel equally between recreational and commercial fishermen in the Atlantic group, with an increase in Total Allowable Catch (TAC) levels.

[56] Permit data provided by the Southeast Regional Office for this fishery do not allow for a breakdown of permits by gear type.

- **Amendment 5 (1990)**. Amendment 5 made a number of changes in the management regime, including the following: extending the management area for Atlantic groups of mackerel through the Mid-Atlantic Fishery Management Council's area of jurisdiction; revising the fishery and plan objectives; revising the overfishing definition; revising the fishing year for the Gulf group of Spanish mackerel; adding cobia to the annual stock assessment procedure; assigning SAFMC responsibility for pre-season adjustments of the TACs and bag limits for the Atlantic migratory groups of mackerel, and the Gulf Council similar responsibility for the Gulf migratory groups; specifying that Gulf group king mackerel may only be taken by hook-and-line and run-around gillnets; and establishing minimum sizes for king mackerel.

- **Amendment 6 (1992)**. Amendment 6 also made substantial changes to the FMP designed to rebuild overfished stocks of mackerel. Implemented measures included size limits, trip limits, seasonal closures, and gear restrictions.

- **Amendment 7 (1994)**. Amendment 7 equally divided the eastern zone commercial quota for the Gulf migratory group of king mackerel between the Florida east and west coast fisheries. It further divided the quota for the west coast sub-zone into equal quotas for hook-and-line and run-around gillnet harvesters. The intended effects of this rule were (1) the equitable allocation of the eastern zone commercial quota among users, and (2) avoiding the negative social and economic consequences of a disproportionately large harvest in the commercial fishery for Gulf group king mackerel off the west coast of Florida.

- **Amendment 8 (1996)**. Amendment 8 made a number of changes to the management regime, including establishment of a moratorium on commercial king mackerel permits until no later than October 15, 2000; increasing the income requirement for a king or Spanish mackerel permit; setting an optimum yield (OY) target at 30 percent of the static spawning potential ratio (SPR); and clarifying ambiguity about allowable gear specifications for the Gulf group king mackerel fishery.

- **Amendment 9 (2000)**. Amendment 9 changed the percentage of the commercial allocation of TAC for the Florida east coast and Florida west coast. It also allowed possession of cut-off (damaged) king or Spanish mackerel that comply with the minimum size limits and the trip limits in the Gulf, Mid-Atlantic, or South Atlantic EEZ.

- **Amendment 10 (1998)**. Amendment 10 designated essential fish habitat (EFH) and Habitat Areas of Particular Concern for coastal migratory pelagic resources.

- **Amendment 11 (1998)**. Amendment 11 amended the FMP to make the definitions for MSY, OY, overfishing, and overfished consistent with the "National Standard Guidelines."

- **Amendment 12 (1999)**. Amendment 12 extended the commercial king mackerel permit moratorium from October 15, 2000 to October 15, 2005, or until replaced with a license limitation, limited access, and/or individual fishing quota or individual transferable quota system (ITQ), whichever occurs earlier.

- **Amendment 13 (2002)**. Amendment 13 established two marine reserves in the EEZ of the Gulf of Mexico, known as Tortugas North and Tortugas South, in which fishing for coastal migratory pelagic species is prohibited. This action complements previous actions taken under the National Marine Sanctuaries Act.

- **Amendment 14 (2002)**. Amendment 14 established a 3-year moratorium on the issuance of charter vessel and headboat king mackerel permits in the Gulf, unless replaced by a comprehensive effort limitation system. The control date for eligibility was established as March 29, 2001. The amendment also included other provisions for eligibility, application, appeals, and transferability of permits.

- **Amendment 15 (2004)**. Amendment 15 established an indefinite limited access program for king mackerel in the EEZ under the jurisdiction of the Gulf of Mexico, South Atlantic, and Mid-Atlantic Fishery Management Councils. It also changed the fishing year to March 1 through February 28/29 for Atlantic group king and Spanish mackerel.

In March of 2007, public comment was solicited on a new amendment (Amendment 18), which sets the Atlantic migratory group king mackerel TAC at 7.1 million pounds and the Atlantic migratory group Spanish mackerel TAC at 6.7 million pounds. Additionally, this amendment changes the Atlantic migratory group Spanish mackerel trip limits to track the new fishing year established in Amendment 15.

Regulations to Reduce Incidental Takes of Protected Species

The Coastal Migratory Pelagic Species Fishery is listed as a Category II fishery (Southeast Atlantic gillnet fishery) and is subject to regulations under the ALWTRP to reduce interactions with large whales.

9.4.3.7 Black Sea Bass

9.4.3.7.1 The Northern Fishery

The northern portion of the black sea bass fishery extends from Cape Hatteras to the U.S./Canada border. Commercial landings of black sea bass in the Northeastern U.S. totaled 3.3 million pounds in 2002, with a total ex-vessel value of $5.6 million. In the 2002 fishing year, a total of 1,532 vessels held black sea bass permits. Of this number, a total of 265 vessels (about 17 percent) relied primarily upon gear that is potentially subject to regulation under the ALWTRP. In 2002, this gear accounted for 44 percent (or 1.4 million pounds) of total landings.

Management History

Commercial landings of black sea bass have been recorded since the late 1800s. These data indicate that annual landings north of Cape Hatteras averaged approximately six million pounds from 1887 until 1948, when they increased to approximately 15.2 million pounds. Shortly thereafter, landings of black sea bass declined dramatically, falling from a peak of 22 million pounds in 1952 to 1.3 million pounds in 1971. At the time of the development of the first Federal management plan in 1994, commercial landings of black sea bass totaled approximately two million pounds per year.

A spring offshore survey and an autumn inshore survey of black sea bass have been conducted every year since 1972. The spring offshore survey is used to create an index for black sea bass recruits (fish longer than 20 cm SL[57]), while the autumn inshore survey is used as an index for black sea bass pre-recruits (fish longer than 11 cm SL). In the 1970s, the spring recruit index ranged from 2.0 to 6.09 fish per tow. In 1982, this number had plunged to a low of 0.2 per tow. Prior to the approval of the first black sea bass FMP, the spring index ranged from 0.28 in 1994 to 0.87 in 1997 (NEFSC, 1995). The fall pre-recruit index showed a similar declining trend during this period.

The black sea bass fishery in the Northeast is jointly managed by the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fishery Management Council (MAFMC) under the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. The Council first started work on an FMP for black sea bass in 1978. The development of the black sea bass plan was delayed, however, through a series of amendments to the Summer Flounder FMP, and work on a separate Black Sea Bass FMP did not resume until 1993.

In 1996, NMFS requested that the black sea bass regulations be incorporated into the Summer Flounder FMP to reduce the number of separate fisheries regulations issued by the Federal government. The Black Sea Bass FMP was incorporated into the summer flounder regulations in Amendment 9 to the Summer Flounder FMP.

Based on fishery conditions in the early-to-mid 1990s, Amendment 9 set a target annual exploitation rate of 23 percent. The estimated annual exploitation rate in the fishery at the time

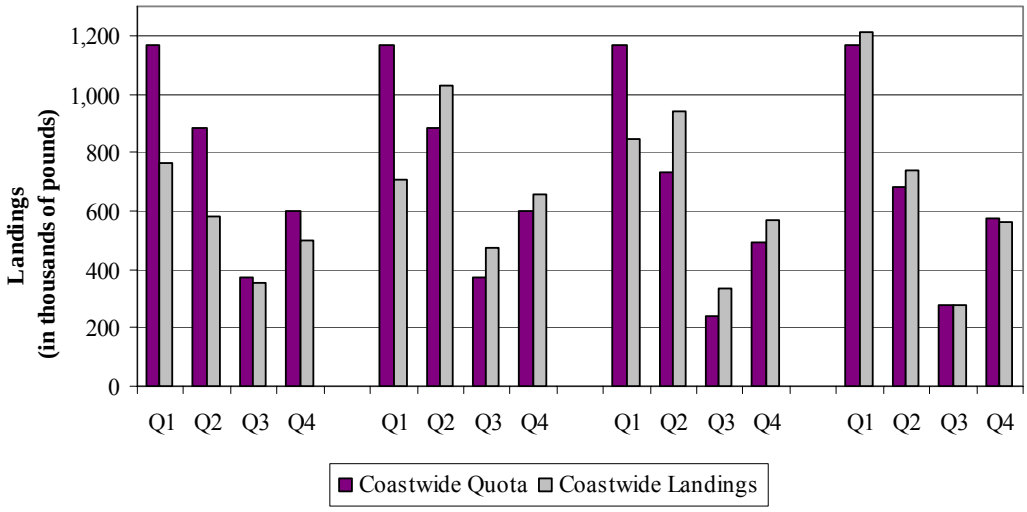
[57] Standard length (SL) of fish is estimated to the nearest centimeter.

was 60 percent. In order to reach the target exploitation rate, the Board approved a recovery strategy to reduce overfishing over an eight-year time frame. During the first two years of this period, the strategy established minimum fish sizes and commercial gear regulations aimed at reducing mortality rates for smaller black sea bass. Beginning in the third year, additional regulations established an annual commercial quota allocated in four quarters, designed to reduce mortality for larger black sea bass. Under this system. the fishery was to be closed once the quota available for each quarter was harvested.

The Commission designed the commercial quota system to allow for black sea bass to be landed during the entire three months in each quarter. However, the black sea bass fishery experienced early closures during the last three quarters of 1999 and 2000. In quarters 3 and 4 of 2000, the quarterly allocation was harvested within one month, leaving the fishery closed for the remaining two months of those quarters. In 2001, early closures were required in all four quarters (Exhibit 9-14 to 9-15).

Exhibit 9-14

BLACK SEA BASS QUOTA AND LANDINGS 1998-2001



Source: ASMFC, 2002a.

Responding to the economic difficulties associated with these long quarterly closures, the Commission chose to abandon the quarterly system in favor of state-by-state quota management (Exhibit 9-16). This resulted in the passage of Amendment 13, in which NMFS implemented compatible Federal regulations to establish coast-wide annual quotas effective March 31, 2003 (67 FR 72131 and 68 FR 10181). These requirements were continued by an August 2004 addendum. In addition, the 2004 adoption of Framework 5 to the FMP allowed for annual specifications of total allowable landings (TAL) to remain in effect for up to three years (69 FR 62818). Since then, Addendum XIII (2004) has allowed more latitude in establishing three-year TALs, and Addendum XVI (2006) has provided mechanisms to ensure that a state meets its obligations under the FMP in ways that minimize the probability that a state's delay in complying could adversely affect other states' fisheries or conservation of the resource.

A stock assessment report drafted in 2004, which concluded that the black sea bass stock was not overfished, was withdrawn in 2006 after not passing the peer review process. A new stock assessment report is underway. As of 2006, a TAL of 6.5 million pounds was specified for state waters, and a TAL of 5 million pounds was specified for Federal waters.

Exhibit 9-15

NORTHERN BLACK SEA BASS FISHERY CLOSURES

Year	Quarter	Number of weeks closed
1999	Quarter 1	0
	Quarter 2	2
	Quarter 3	1
	Quarter 4	2
2000	Quarter 1	0
	Quarter 2	3
	Quarter 3	9
	Quarter 4	7
2001	Quarter 1	3
	Quarter 2	3
	Quarter 3	9
	Quarter 4	7
2002	Quarter 1	0
	Quarter 2	3
	Quarter 3	8
	Quarter 4	0

Source: ASMFC, 2002a and NMFS, 2004d.

Exhibit 9-16

STATE-BY-STATE BLACK SEA BASS ALLOCATION

State	Percent of Quota
Maine	0.5%
New Hampshire	0.5%
Massachusetts	13%
Connecticut	1%
New York	7%
New Jersey	20%
Rhode Island	11%
Delaware	5%
Maryland	11%
North Carolina	11%
Virginia	20%
TOTAL:	**100%**

Source: ASMFC, 2002b.

Regulations to Reduce Incidental Takes of Protected Species

The northern black sea bass trap/pot fishery is listed as a Category II fishery (Atlantic mixed species trap/pot), elevated in 2001 from Category III (66 FR 42780), due to potential interactions with marine mammals, particularly the endangered North Atlantic right whale. The northern black sea bass gillnet fishery is also subject to regulations under the Harbor Porpoise Take Reduction Plan (HPTRP) that prohibit the setting of gillnets in certain areas for selected time periods. These closures include a prohibition on the use of large mesh gillnet gear west of 72°30' in southern Mid-Atlantic waters (Maryland, Delaware, Virginia and North Carolina) from February 15 through March 15. Although the closure is meant to prevent harbor porpoise takes in gillnet gear, it may also benefit sea turtles by reducing gillnet effort off of North Carolina during this time period, when sea turtles may be present.

In addition to regulations implemented under the HPTRP, it is possible that the northern black sea bass fishery will be subject to future regulations promulgated under the Sea Turtle Strategy.

9.4.3.7.2 The Southern Fishery

The southern portion of the black sea bass trap/pot fishery extends from Cape Hatteras, NC, to Cape Canaveral, FL, but the majority of the pot fishery is concentrated off North Carolina and northern South Carolina. In the southeast, approximately 0.9 million pounds of black sea bass were caught with traps and pots in 2002. Commercial vessel permits are issued in the southeast for the South Atlantic snapper-grouper fishery, which includes black sea bass. These permits are issued pursuant to the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region. During the 2002 calendar year, 1,519 vessels were permitted for the snapper/grouper complex. Exhibit 4-24 (see Chapter 4) summarizes the number of permitted vessels, by permit type.

Management History

The southern portion of the black sea bass fishery is managed under the South Atlantic Fishery Management Council's (the Council) Snapper-Grouper Fishery Management Plan. The FMP establishes minimum fish sizes, gear restrictions, and vessel permitting and reporting requirements for the southern black sea bass fishery.

In 1991, the Council approved Amendment 4 to the FMP, implementing a series of regulations to reduce mortality of overfished species in the snapper/grouper complex. This action prohibited black sea bass pot fishermen from making multi-gear trips and retaining the incidental catch of other species. This action unintentionally resulted in large economic losses for black sea bass fishermen; in response, the Council requested emergency regulations on July 18, 1992 to modify the definition of black sea bass pots, allow multi-gear trips, and allow retention of incidentally caught fish. On December 11, 1992, the Council submitted a regulatory amendment implementing the emergency action provisions on a permanent basis.

In 1996, a new stock assessment of the snapper/grouper complex, based on 1995 data, was released. The stock assessment produced a spawning potential ratio (SPR) of 26 percent, indicating that the species was overfished.[58] This assessment was supported by data on the catch-per-unit-effort of headboats off South Carolina, which had declined from just over 11 fish per angler day in 1980 to just over one fish per angler day in 1995. The Council identified the need for a 56 percent reduction in black sea bass mortality to achieve Optimum Yield (OY), and the need to reduce mortality by 22 percent to eliminate overfishing. Under Amendment 9 (1998), the Council responded to this new information, increasing the minimum size limit to ten inches; establishing a recreational bag limit of 20 black sea bass per person per day; and requiring escape vents and panels with degradable fasteners on black sea bass pots.

According to the Status of Fisheries Report to Congress (2002), the southern black sea bass fishery remained overfished following implementation of Amendment 9. To address the lack of improvement in the southern black sea bass stock, the SAFMC implemented Amendment 13C to the Snapper Grouper FMP (71 FR 33423). This measure:

- Changes the commercial and recreational fishing years from the calendar year to June 1 through May 31;
- Establishes an annual commercial quota that is to decrease over three years from 477,000 pounds in Year 1 (June 1, 2006, to May 31, 2007) to 423,000 pounds in Year 2 (June 1, 2007, to May 31, 2008), and to 309,000 pounds in Year 3 (June 1, 2008, to May 31, 2009);
- Requires the use of at least 2-inch mesh for the entire back panel of pots;
- Requires the removal of pots from the water once the commercial quota is met;
- Establishes a recreational allocation that would decrease over three years from 633,000 pounds in Year 1 to 560,000 pounds in Year 2, and to 409,000 pounds in Year 3;
- Increases the recreational size limit from 10-inch total length (TL) to 11-inch TL in Year 1 and 12-inch TL in Year 2; and
- Reduces the recreational bag limit from 20 to 15 per person per day.

The SAFMC is currently developing Amendment 15 to the Snapper Grouper FMP. Among other measures, this amendment is expected to set timelines and outline additional strategies for rebuilding the southern black sea bass fishery.

[58] Species can be classified as overfished if values of fishing mortality (F), spawning stock biomass (SSB), or spawning potential ratio (SPR) are above or below target levels.

Regulations to Reduce Incidental Takes of Protected Species

The southern Atlantic black sea bass trap/pot fishery is listed as a Category II fishery (Atlantic mixed species trap/pot) due to potential interactions with marine mammals, particularly the endangered North Atlantic right whale. The southern Atlantic black sea bass fishery is subject to the same marine mammal protection regulations as the northern black sea bass fishery, including regulations on black sea bass gillnet fisherman established under the Harbor Porpoise Take Reduction Plan (HPTRP). Like the northern fishery, the southern fishery may also be subject to future regulations under NMFS' Sea Turtle Strategy.

9.4.3.8 Hagfish

Landings of hagfish in the Northeastern U.S. totaled three million pounds in 2002, with a total ex-vessel value of $1 million (see Exhibit 9-17). Nearly all hagfish were caught with fish pots and traps, gear that is potentially subject to ALWTRP regulations.

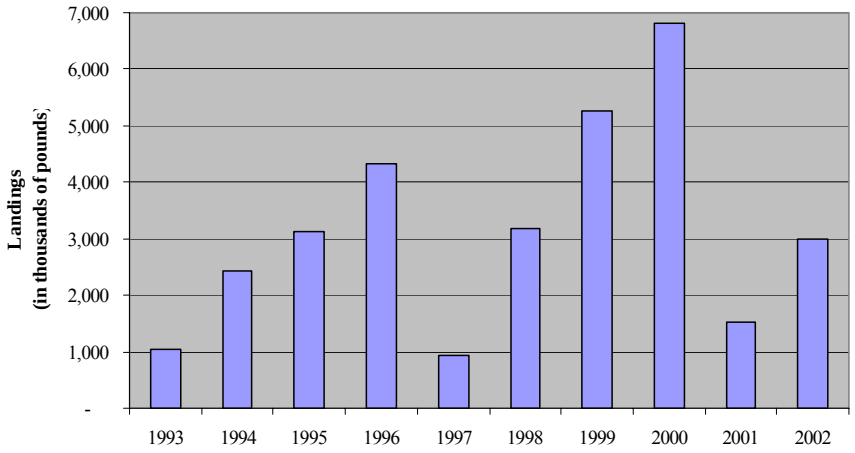
Management History

Currently, the Atlantic hagfish fishery is not regulated, but NMFS and the New England Fishery Management Council are moving toward developing a management scheme for the fishery. On September 9, 2002, NMFS issued a Notice of Proposed Rulemaking that established a control date of August 28, 2002 for potential future use in determining historical or traditional participation in the fishery.[59] In this notice, NMFS also stated its intent to encourage the New England Fishery Management Council to develop an FMP for the fishery, preventing overcapitalization and increased pressure on the stock due to a movement of vessels into the fishery. This action was motivated, in part, because scientific studies suggest that Atlantic hagfish are likely vulnerable to overfishing due to the low reproductive capacity of the species (67 FR 55191). As a result of these findings, NMFS and the Council are developing a hagfish FMP (NMFS, 2005b) and recently established observer requirements for hagfish vessels, as well as reporting requirements for all dealers purchasing hagfish directly from vessels (72 FR 20036). These requirements are designed to provide data that will support development of the FMP.

[59] The notice also served to deny the rulemaking requested in a Petition for Rulemaking asking NMFS to implement emergency measures to limit entry into the fishery, as emergency action was deemed unnecessary.

Exhibit 9-17

ATLANTIC HAGFISH LANDINGS 1993-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD

9.4.3.9 Red Crab

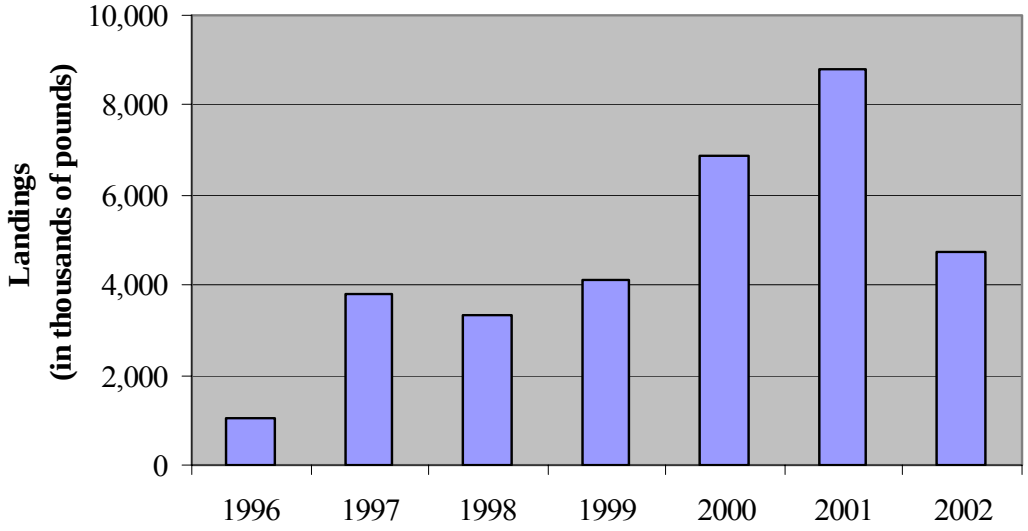
About 4.8 million pounds of red crab were landed in the Northeastern U.S. in 2002, with an ex-vessel value of roughly $4 million. Almost all of the red crab landed was caught using crab pots and traps, gear that is potentially subject to ALWTRP regulations.

Management History

Since the early 1970s there has been a small directed red crab fishery off the New England and Mid-Atlantic coasts. Though the size and intensity of this fishery has fluctuated since its origin, it has remained consistently small relative to more prominent New England fisheries such as groundfish, sea scallops, and lobster. Throughout the 1980s, landings averaged approximately 5.5 million pounds per year. In the late 1990s, landings increased substantially, reaching a peak in 2001 of 8.8 million pounds (Exhibit 9-18). It is suspected that the increased activity in this fishery in the mid-1990s might be a result of the implementation of Amendment 5 to the Northeast Multispecies (Groundfish) FMP, and the subsequent redirection of some fishing effort to “under-exploited” fishery resources such as red crab.

Exhibit 9-18

RED CRAB LANDINGS 1995-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

Faced with the increase in landings and interest in the fishery, a group of fishermen approached the New England Fishery Management Council (the Council) in late 1999 requesting the Council to develop a fishery management plan for the red crab fishery. They also asked the Council to consider taking steps to limit access to the fishery, a measure they hoped would help the fishery maintain yields at sustainable levels. In November 1999, the Council agreed to begin development of a red crab FMP, and in 2000 a control date was established for the fishery to discourage "speculative entry," or rapid entry of new vessels into the fishery while the management plan was undergoing development.

Reducing the threat of overfishing became the primary objective of the new red crab FMP. A comprehensive survey conducted when the fishable stock of this resource was considered to be in “virgin” condition estimated maximum sustainable yield (MSY) at 5.5 million pounds of exploitable males (Serchuk, 1977). The Council concluded that average commercial landings of red crab have exceeded this level several times, and in 1982, NMFS declared the red crab resource was “becoming fully exploited.” This determination was based on an increase in landings from nearly 2.7 million pounds in 1979 (there had been a fairly steady increase in landings since 1974) to just over 5.6 million pounds in 1980 (NMFS, 1982). The following year NMFS revised this status to “fully exploited” after landings increased to 6.8 million pounds in 1981 (NMFS, 1983). In more recent years, beginning in 1998, red crab landings increased dramatically again to levels near or above MSY.

The final Red Crab FMP was implemented on October 21, 2002 (67 FR 63221). The plan granted controlled access permits to vessels that demonstrated average annual landings of red crab greater than 250,000 pounds during a qualifying time period. Five vessels qualified for controlled access permits in fishing year 2002. Additional measures implemented include:

- The establishment of baseline trip limits (75,000 pounds) that restrict the amount that can be landed during each fishing trip, with one vessel qualifying for a higher trip limit of 125,000 pounds, based on its landings history;

- Designation of an annual total allowable catch (TAC);

- Allocation of days-at-sea (DAS, the number of days that can be fished each year) to vessels with a controlled access permit;

- Trap limits (600 traps per vessel); and

- Limitation on full processing at sea.

The 2003 fishing year was the first full year with the Red Crab FMP in place. In this year, the FMP allocated the red crab fishery 780 days-at-sea and a TAC of 5.9 million pounds. These effort restrictions translated into 156 days-at-sea for each of the five qualified limited access vessels in the red crab fleet.

Provisions within the Red Crab FMP require the Council to review the status of the stock and the fishery every year, as well as prepare a biennial Stock Assessment and Fishery Evaluation (SAFE Report). The recent adoption of Framework 1 to the FMP, in 2005, allows for annual specifications to remain in effect for up to 3 years (70 FR 44060). For the 2004-2006 fishing years, the DAS allocation and TAC level remained unchanged for the red crab fishery.

Regulations to Reduce Incidental Takes of Protected Species

The red crab fishery is listed as a Category II fishery (Atlantic mixed species trap/pot fishery) due to potential interactions with marine mammals. The red crab fishery is subject to regulations under the ALWTRP, including a requirement to install a weak link at all buoys that break away knotless at 3,780 pounds.

9.4.3.10 Scup

In 2002, commercial landings for scup totaled 7.3 million pounds; of this, approximately seven percent, or 531,000 pounds, were caught using traps and pots. The ex-vessel value of scup landings in the Northeast totaled $4.8 million in 2002. Of these revenues, 11 percent came from fish caught with ALWTRP-regulated gear. A total of 157 vessels in fishing year 2002 held a scup permit where the primary gear identified was traps and pots.

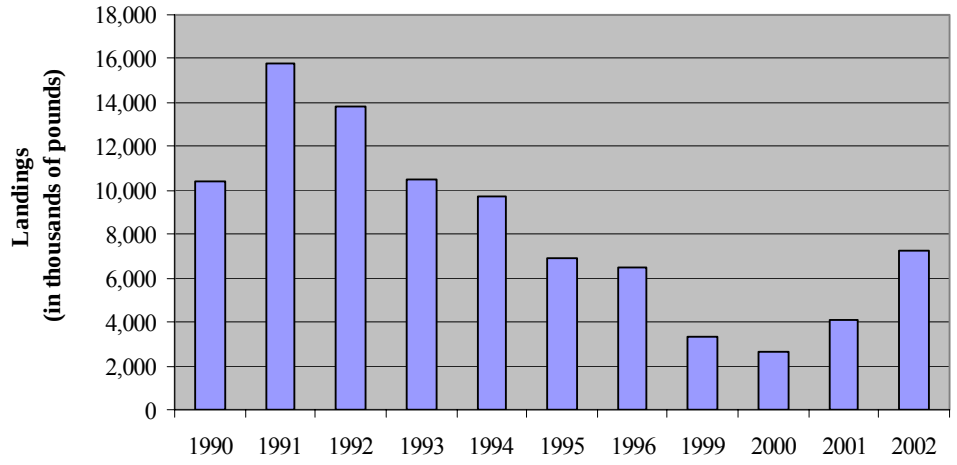
Management History

Commercial scup landings have declined substantially since peaking in the 1960s. In 1989, commercial landings decreased to 8.2 million pounds, the lowest value recorded during the

ten-year period from 1983 to 1992, and only about 17 percent of the 49 million pounds landed in 1960. More recently, the collapse of the Northeast groundfish fishery has resulted in increasing fishing pressures on the already overexploited scup fishery. Annual landings of scup declined from just over 15 million pounds in 1991 to less than 3 million pounds in 2000. Since 2000, however, annual landings have increased. In 2002, annual landings totaled more than 7 million pounds (Exhibit 9-19).

Exhibit 9-19

ATLANTIC SCUP LANDINGS 1990-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

The Atlantic States Marine Fisheries Commission (Commission) and the Mid-Atlantic Fishery Management Council (Council) jointly manage the scup fishery. The Council approved the first Scup FMP under Amendment 8 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (61 FR 56125). Amendment 8 defines overfishing for the scup as fishing in excess of the F_{max} level, where F_{max} is equal to 0.24 (or an annual exploitation rate of 19 percent). Based on a review of coastwide data, mortality rates in the early 1980s were slightly greater than 0.3. These rates rose to 1.0 in 1988 and 1.3 in 1996 (or an annual exploitation rate of 67 percent). This information indicated that overexploitation in the scup fishery started in the early 1980s; in order to achieve F_{max}, the plan identified a need to reduce current exploitation rates by 72 percent.

To reduce scup mortality, the Council adopted a seven-year strategy. Year 1 implemented minimum fish sizes and commercial gear regulations, measures designed to reduce the mortality rate for smaller scup. Beginning in Year 2, the strategy implemented a coastwide annual quota, or Total Allowable Catch (TAC). This annual quota is divided into three periods: Winter I, Summer, and Winter II. Addendum V, approved in 2002, establishes a state-by-state allocation system for the summer period. In this system, each state receives a share of the summer period quota based on commercial landings from 1983-1992. The fishery is closed each period once the quota for the season has been reached.

In addition to effort control, Amendment 8 includes a moratorium on commercial permits. Under this moratorium, only a limited number of permits are granted each year. The purpose of this provision is to cap entry so that new entrants to the fishery do not dissipate future gains in productivity and profitability.

The 2000 scup stock assessment classified the resource as overfished. Since then, an updated stock assessment, completed in June 2002, indicated scup was no longer overfished, but that the "stock status with respect to overfishing cannot currently be evaluated." In addition, the report concluded that, although the "relative exploitation rates have declined in recent years, the absolute value of F [fishing mortality] cannot be determined." The assessment, however, did state that "survey data indicate[s] strong recruitment and some rebuilding of age structure" in recent years. However, in 2005, the scup index of recruitment declined and scup is now again considered overfished (ASMFC, 2005).

The Council and ASMFC are currently considering measures that would establish a program and timeline for rebuilding scup stocks. The Council, through Amendment 14 to the FMP, has proposed a timeline of seven years to rebuild the stock in Federal waters, with an option to extend the timeline for three additional years (72 FR 18193). ASMFC has opted to wait until survey data gathered by different monitoring vessels are standardized before proposing a timeline.

Regulations to Reduce Incidental Takes of Protected Species

The Atlantic scup gillnet fishery is listed as a Category I fishery (Mid-Atlantic coastal gillnet), elevated in 2003 from Category II, mostly due to potential interactions with marine mammals, particularly protected dolphins. The Atlantic scup trap/pot fishery is listed as a Category II fishery (Atlantic mixed species trap/pot fishery) due to potential interactions primarily with the endangered North Atlantic right whale. The Atlantic scup gillnet fishery is subject to regulations under the Harbor Porpoise Take Reduction Plan (HPTRP) that prohibit the setting of gillnets in certain areas for selected time periods. These closures include a prohibition on the use of large mesh gillnet gear west of 72°30' in southern Mid-Atlantic waters (Maryland, Delaware, Virginia and North Carolina) from February 15 through March 15. Although the closure is meant to prevent harbor porpoise takes in gillnet gear, it should also benefit sea turtles by reducing gillnet effort where sea turtles occur during this time period. In addition to regulations implemented under the HPTRP, it is possible that the Atlantic scup gillnet and trap/pot fisheries will be subject to future regulations promulgated under the Sea Turtle Strategy.

9.4.3.11 Jonah Crab

Jonah crab is traditionally caught as incidental catch to the Maine lobster fishery. Landings of Jonah crab in the Northeastern U.S. totaled 2.6 million pounds in 2002, with an ex-vessel value of $1.5 million. Nearly all of the landings were accounted for by ALWTRP-regulated gear.

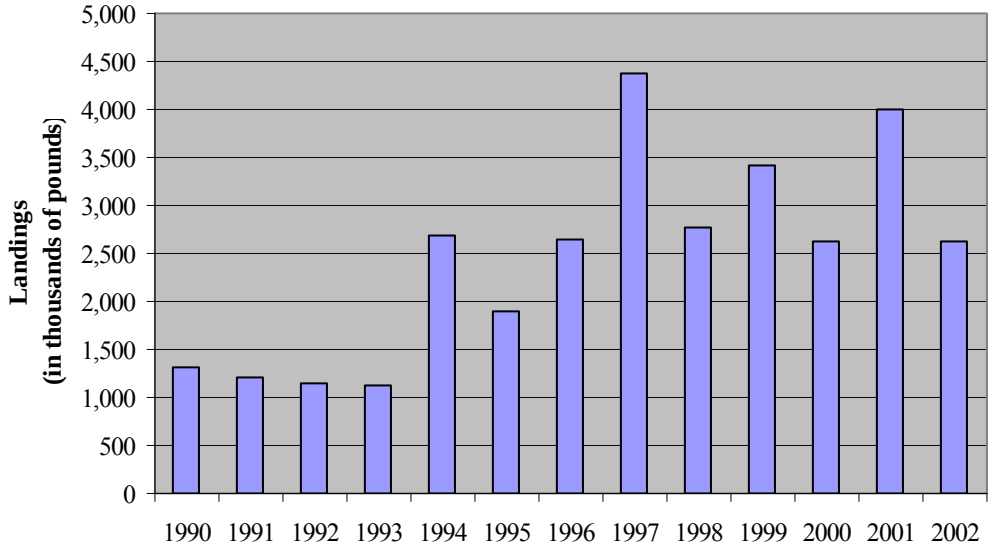
Management History

Jonah crab is currently an unregulated species in Federal waters. Little is known about the species' biology, distribution, and relative abundance. A recent increase in apparent abundance and market demand has focused new attention on this traditional species caught incidentally in the Maine lobster fishery. Landings data over the last decade confirm the emergence of the fishery, with landings peaking in 1997 at just over 4 million pounds (Exhibit 9-20).

In September 2003, the Maine Department of Marine Resources (DMR) was granted a one-year Exempted Fishing Permit that allowed up to 100 permitted lobster fishermen to set up to 200 modified lobster traps (in addition to their normal trap allocation) in Federal waters of Federal Lobster Management Area 1.[60] Through this process, Maine DMR hopes to demonstrate that the modified lobster trap will catch Jonah crabs only and not lobster. The DMR expects that this study could clarify the sustainability and practicality of a directed Jonah crab fishery in the area (C. Wilson, pers. comm., 2003).

Exhibit 9-20

JONAH CRAB LANDINGS 1990-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

[60] This permit was also granted for the previous fishing year.

9.4.3.12 Conch/Whelk

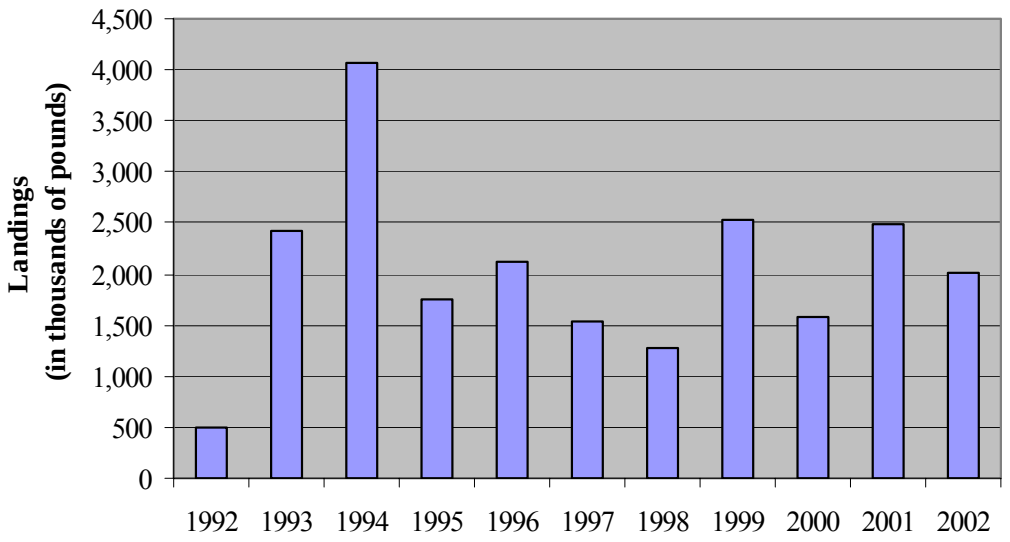
The Atlantic Coast whelk fishery targets two principal species, the knobbed whelk (*Busycon carica*) and the channeled whelk (*Busycon canaliculatum*).[61] Approximately 6.3 million pounds of whelk were landed in the Northeast U.S. in 2002, with a total ex-vessel value of $3.3 million. Traps and pots accounted for 54 percent of total landings.

Management History

Conch/whelk is currently an unregulated species in Federal waters. The commercial conch/whelk pot fishery extends along the Atlantic coast from Massachusetts to the Carolinas. Little is known about the relative abundance of the conch/whelk resource. Conch/whelk landings over the last decade have remained steady at approximately two million pounds a year, with a peak in 1994 of approximately 4.1 million pounds (Exhibit 9-21).

Exhibit 9-21

CONCH/WHELK LANDINGS 1992-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

9.4.3.13 Summary of Factors Affecting Fishery Resources

Exhibit 9-22 summarizes the status; the past, present, and reasonably foreseeable future actions; and the overall effect of those actions on the 12 major fisheries affected by the regulatory alternatives.

[61] The knobbed and channeled whelk caught along the Atlantic coast are commonly referred to as "conch" in industry transactions.

Exhibit 9-22

SUMMARY OF FACTORS AFFECTING FISHERY RESOURCES

Fishery	Stock Status[1]	Major Past, Present, And Reasonably Foreseeable Future (PPRFFA) Actions	Effect of PPRFFAs
Lobster Trap/Pot Fishery			
American Lobster	• Overfishing[2]	• Amendment 3 • Addendum I trap reductions • Potential restrictions under sea turtle strategy	Positive
Gillnet Fisheries			
Northeast Multispecies	• Overfished and Overfishing: Cod (GOM/GB); Yellowtail Flounder (CC/GOM); Yellowtail Flounder (SNE/MA); Yellowtail Flounder (GB); White Hake; Atlantic Halibut; and Winter Flounder (SNE/MA) • Overfished but not overfishing: Haddock (GOM); Haddock (GB); Windowpane Flounder (SNE/MA); American Plaice; and Ocean Pout • Overfishing but not overfished: Winter Flounder (GOM) • Not overfishing; not overfished: Witch Flounder; Pollock; Windowpane Flounder (GOM/GB); Winter Flounder (GOM); and Silver Hake (GOM/NGB) • Overfishing unknown: Silver Hake (SGB/GOM); Silver Hake (SGB/MA); Red Hake (GM/NGB); Red Hake (SGB/MA); Atlantic Halibut; Offshore Hake	• See 9.4.3.2 for history of management actions • Amendment 13 (May 1, 2004)	Positive
Monkfish	• Northern stock: overfishing and overfished • Southern stock: overfishing and overfished	• Monkfish FMP DAS reductions	Positive
Spiny Dogfish	• Overfishing[3]	• Spiny Dogfish FMP DAS reductions	Positive
Shark Fisheries	• Overfished and Overfishing: Large Coastal Shark Complex • Overfishing but not overfished: Finetooth Shark and Sandbar Shark • Not overfishing; not overfished: Atlantic Sharpnose Shark; Blacknose Shark; Blacktip Shark; and Bonnethead Shark • Unknown: Shortfin Mako Shark	• Amendment 1 harvest quotas, time/area closure, VMS requirements, measures to reduce bycatch and bycatch mortality, and modified recreational limits	Positive
Coastal Migratory Pelagic	• Overfished but not overfishing: King Mackerel (Gulf) • Not overfishing; not overfished: King Mackerel (Atlantic); Spanish Mackerel; and Little Tunny • Unknown: Dolphin; Cobia; and Bluefish	• See 9.4.3.6 for history of management actions • Amendment 12 harvest quotas	Positive

Notes:

1 NMFS (2003e) used for American lobster, spiny dogfish, shark fisheries, and coastal migratory pelagic species. NMFS (2005c) used for Northeast multispecies and monkfish.

2 While there is no clear biomass target in the ASMFC FMP, the 2000 ASMFC Assessment for American Lobster found that lobster stocks are growth overfished.

3 There is currently no definition contained in the FMP to make a determination of biomass target; however, based on the current NMFS recommended biomass threshold, the biomass estimates indicate the stock is overfished.

Exhibit 9-22

SUMMARY OF FACTORS AFFECTING FISHERY RESOURCES

Fishery	Stock Status[1]	Major Past, Present, And Reasonably Foreseeable Future (PPRFFA) Actions	Effect of PPRFFAs
Other Trap/Pot Fisheries			
Black Sea Bass Northern	• Overfishing and overfished	• Amendment 9 harvest quotas • Amendment 13 harvest quotas • HPTRP area restrictions • Potential restrictions under sea turtle strategy	Positive
Southern	• Overfishing and overfished	• Amendment 9 increases in minimum size; gear modifications • Amendment 13C measures to reduce southern black sea bass fishing effort • Potential restrictions under sea turtle strategy	Positive
Hagfish	Unknown	• Not a federally managed fishery at this time.	Not applicable
Red Crab	Unknown	• Red Crab FMP harvest quota	Positive
Scup	• Overfishing but not overfished	• Amendment 8 harvest quota • Restrictions for the Atlantic scup gillnet fishery under HPTRP • Potential restrictions under sea turtle strategy	Positive
Jonah Crab	Not available	• Not a federally managed fishery at this time.	Not applicable
Conch/Whelk	Not available	• Not a federally managed fishery at this time.	Not applicable

Notes:
[1] NMFS, 2003e

9.4.4 Habitat

This section has three basic objectives:

- First, it provides a brief regulatory history of the protection of essential fish habitat (EFH) and its integration into Federal fishery management actions.

- Second, it discusses the past, present, and reasonably foreseeable future actions affecting EFH in the Atlantic region.

- Third, it summarizes past, present, and reasonably foreseeable future management actions affecting EFH in the Atlantic region.

9.4.4.1 Management History

In conjunction with the 1996 reauthorization of the MSA through the Sustainable Fisheries Act, Congress amended the MSA by codifying elements of the Habitat Conservation Plan (50 CFR 605.805). Specifically, the 1996 amendments emphasized the importance of habitat protection in maintaining healthy fisheries and promulgated regulations to promote the protection, conservation, and enhancement of the habitats of marine, estuarine, and anadromous finfish, mollusks, and crustaceans. This habitat is termed “essential fish habitat” (EFH) and was

broadly defined in the regulations to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Habitat Areas of Particular Concern (HAPCs) are described in the regulations as subsets of EFH. HAPCs are rare habitat areas of special ecological importance that are particularly susceptible to human-induced degradation or located in an environmentally stressed area. Designated HAPCs are not afforded any additional regulatory protection under the Act; however, Federal projects with potential adverse impacts on HAPCs will be more carefully scrutinized during the consultation process.

A second major component of the new habitat regulations required Fishery Management Councils, with guidance from NMFS, to amend their FMPs to describe and protect EFH, and to mitigate any adverse impacts potentially caused by fishing activities. In addition, the regulations provide fishery management options to help guide NMFS and the Councils in reducing adverse impacts on EFH, including, but not limited to, fishing equipment restrictions, time/area closures, and harvest limits.

After the passage of the 1996 amendments, NMFS began development of a final rule implementing the proposed regulations on essential fish habitat. On January 9, 1997 (62 FR 1306) NMFS announced the availability of the "Framework for the Description, Identification, Conservation, and Enhancement of Essential Fish Habitat" (Framework). Over the next year, NMFS held public meetings, briefings, and workshops across the nation to refine the Framework and the pending rule. On December 19, 1997, NMFS issued an interim final rule (62 FR 66531) and on January 20, 1998 the interim final rule took effect. The interim final rule required the Councils to amend fishery management plans by October 1998 and specifically to:

- Describe and identify the essential habitat for species managed by the Council;
- Minimize, to the extent practicable, adverse effects on EFH caused by fishing; and
- Identify other actions to encourage the conservation and enhancement of EFH.

In the Northeast, EFH has been identified for a total of 59 species covered by 14 fishery management plans (FMPs), under the auspices of either the New England Fishery Management Council, Mid-Atlantic Fishery Management Council, South Atlantic Fishery Management Council, or NMFS. A complete list of managed species with EFH designations in the Northeast, as well as other important habitat parameters, is available at: http://www.nero.noaa.gov/hcd/list.htm.

After a five-year public review process, NMFS published a final EFH rule on January 17, 2002, replacing the interim final rule of December 19, 1997. The final rule directs the Councils to conduct periodic reviews of the EFH provisions (including HAPCs) of FMPs and revise or amend EFH provisions as warranted. Furthermore, the regulations specify that a complete review of all EFH information should be conducted at least once every five years.

9.4.4.2 Past, Present, and Reasonably Foreseeable Future Actions Affecting Essential Fish Habitat

This section summarizes past and present events affecting essential fish habitat. Events are defined as activities or occurrences that have or had the potential to induce one or more of the following potential effects: alteration of the physical structure; direct mortality of benthic organisms; sediment suspensions; physical and chemical modifications to the water column; benthic community changes; or ecosystem changes. Events can be either external or internal to the trap/pot and gillnet fisheries. In addition, external events can be either human controlled or natural. Past and present events discussed in the section include:

- Fishing gear impacts;
- Dredging;
- Offal discharge;
- Vessel groundings;
- Port construction and development;
- Oil and/or hazardous materials release;
- Exotic species;
- Toxic algal blooms; and
- Storm surges and wind generated waves.

Fishing Gear Impacts

The main classes of fishing gear used in the Atlantic EEZ can be separated into two groups: mobile fishing gear such as trawls, and fixed fishing gear such as longline, gillnet, and traps/pots. Each gear type has several components or characteristics that determine its overall effect on the benthic environment. In addition, effects of the gear are dependent on the current condition or health of the substrate and associated organisms, and their ability to rebound from external disturbances.

Mobile Fishing Gear

The effects of bottom trawling and other mobile fishing gears on the physical structure of the benthos, sediment suspension, the chemical and physical composition of the water column, and benthic biodiversity (community structure) include changes to living and non-living habitats and potential impacts on prey. External events related to bottom trawling include foreign fisheries (both pre-and post-MSA), as well as bottom trawling conducted in state waters (past and present). Internal events include the operation of domestic groundfish fisheries under the multispecies FMP.

Otter trawls are one type of mobile trawl gear common to the Atlantic EEZ. Otter trawls fish by pulling conical nets through the water; fish encounter the open forward end and are gathered into a restricted bag or “codend” at the back of the net. Otter trawls, especially those

that fish along the bottom for groundfish, have four main components that can connect with the seabed: doors, sweeps, footrope, and netting.

Doors are flattened metal structures that ride vertically in the water column; their sheer weight and force through the water act to horizontally spread the net open and force it down in the water. Some bottom trawl doors use contact with the seafloor to accomplish the spreading and downward pull. On pelagic trawls, the net is pulled above the seafloor and the doors are unlikely to contact the bottom. Trawl doors used in the Atlantic EEZ are typically less than nine feet long.

Sweeps are steel, fiber, or some combination of steel and fiber cables that connect the doors to the trawl net. The cables pass over the bottom at a narrow angle from the direction of travel and herd near-bottom fish toward the net. When used on bottom trawls, these cables commonly come into contact with the seafloor and often have protective disks strung on them. Sweep lengths will vary with the target species fished, substrate characteristics, and individual vessel preference. For example, a large vessel targeting flounder on a smooth bottom may use 1,000 feet of sweeps, while a small cod trawler on rough bottom may only use 100 feet.

The footrope of the trawl is a cable or chain connected along the bottom edge of the trawl net and, on bottom trawls, is designed specifically to contact the seafloor. The footrope usually has rubber cones, spheres, or disks (known collectively as "bobbins") strung along its entire length. The bobbins serve to limit damage to the netting and reduce bycatch of crabs and other invertebrates. Alternatively, tire gear is used in the center net section, particularly when the preferred fishing grounds consist of a rough substrate, to protect the netting and allow fishing in areas where otherwise it would not be possible. Tire gear consists of used vehicle tires or sections of tires linked side-by-side to form a continuous cylinder.

The netting is the least likely component of bottom trawls to directly contact the seafloor. The bobbins or tire gear act to raise the netting so that only very prominent features of the seafloor could come into contact with the netting without entering the trawl. However, the codend can come into contact with the seafloor, particularly when it contains rocks, substrate, or numerous fish.

The pelagic trawl is a specially modified otter trawl designed for catching fish that inhabit the water above the seabed. These trawls have a very large mesh opening in the forward section and the doors are fished above the bottom. By regulation, these trawls must not use bobbins or other protective devices; therefore, the footropes are small in diameter, and typically consist of bare chain. Since these trawls are fished with the doors above the seafloor, door effects on substrates are not realized. Because the footrope is unprotected, pelagic trawls are not used on rough or hard substrates and, therefore, are less likely to contact some of the more vulnerable habitats.

Fixed Gear

Fixed gear fisheries, such as gillnet and trap/pot pot fisheries, affect living and non-living benthic physical structure, cause direct mortality of benthic organisms, resuspend sediment, and, if extensive, modify epifaunal and infaunal prey in localized areas. It is unlikely that these fisheries would cause ecosystem-wide effects because of the short-term, site-specific sets of the fixed gear. Activities or events that employ fixed gear include: the various state-managed trap/pot fisheries for lobster, crab, and shrimp; the various fixed gear fisheries managed within the Atlantic EEZ, including American lobster, red crab, Jonah crab, hagfish, and black sea bass; and anchored gillnet fisheries managed under the multispecies, monkfish, and dogfish FMPs. Chapter 2 provides a description of the fixed gear used in ALWTRP regulated fisheries and fisheries proposed to be managed under the ALWTRP.

Dredging

Dredging is the action of bringing up sediment from the ocean floor either to deepen navigation channels or to harvest shellfish such as clams and scallops. Dredging has the potential to change non-living and living habitat, and to affect epifaunal and infaunal prey. These activities can also resuspend large amounts of sediment and can potentially change the chemical and physical composition of the water column. If widespread and chronic, these actions can cause overall changes to the benthic community.

Offal Discharge[62]

Offal discharge events have occurred in trap/pot and gillnet fisheries both externally and internally. This discharge can alter the physical structure of the benthos, smother benthic organisms, resuspend sediment, alter the chemical and physical composition of the water column, and, if extensive, cause impacts to the benthic community or ecosystem. The latter two effects are more likely in a closed bay or system where water circulation is impeded. In addition, significant amounts of deposition can decrease the oxygen available to benthic organisms, creating anoxic conditions that only a few species (e.g., polychaetes) can survive.

Vessel Groundings

Vessel groundings, both within and external to the trap/pot and gillnet fisheries, influence the physical structure of the benthos and cause direct mortality of benthic organisms. If extensive, these impacts could lead to changes in the benthic community on a very localized, site-specific scale. Therefore, it is unlikely that ecosystem impacts would be realized due to vessel groundings and there are no documented impacts of vessel groundings on EFH.

[62] Offal is defined as all dead and discarded catch and fish by-catch.

Port Construction and Development

Port construction and development has occurred along the Atlantic coast and is likely to have caused the following impacts on the benthic community: alteration of physical structure, direct mortality, sediment re-suspension, chemical and physical modification of the water column, and localized changes in community structure. The localized, site-specific nature of these events, however, makes it unlikely that they would adversely affect overall ecosystem health.

Oil and/or Hazardous Materials Releases

Releases of oil and/or hazardous pollutants into the Atlantic EEZ range from small (less than ten gallon) spills to those of significantly greater magnitude, such as the 35,000 to 55,000 gallon oil spill that occurred on April 27, 2003 in Buzzards Bay (Massachusetts). Large spills cause direct mortality, alter the chemical composition of the water column, and cause changes to the structure of the benthic community.

Oil spills may cover and degrade coastal, inshore and offshore habitats and associated benthic habitats, or may produce a surface slick which disrupts the pelagic community. These impacts can eventually lead to disruption of community organization and dynamics in affected regions. Oil can persist in sediments for years after the initial contamination. Non-point sources of oil include municipal and agricultural run-off, industrial shipping, recreational boating, and contaminated sediments. Point sources include power plant discharge, marine transportation (i.e., ferries, freighters, and tankers), energy and mineral exploration and transportation, and ocean disposal of contaminated dredged material.

Other hazardous pollutants, such as metal contaminants, pesticides and herbicides, and chlorine, can also be found in the water column and persist in the sediments of coastal, inshore, and offshore habitats.

Exotic Species

Introduction of non-native, or exotic, organisms can alter the biological and physical composition of freshwater and marine habitats (Rosecchi et al., 1993; Whitman, 1996). The issue of the introduction of exotic or reared species, including finfish, shellfish, plants, and parasites, in the wild is a major concern, and possibly the largest single problem faced by aquaculturists, ecologists, and resource managers (deFur and Rader, 1995). Reared and exotic organisms have been released from aquaculture facilities accidentally and intentionally (e.g., stocking programs) (Bedzinger, 1994). The natural community structure may be changed through increased competition, niche overlap, predation on indigenous organisms, decreased genetic integrity, and transmission of disease. Several methods, including producing sterile organisms and escape-proof facilities, are being developed to lessen the ecological threats associated with exotic and reared organisms (Conkling and Hayden, 1997; MCZM, 1995).

Toxic Algal Blooms

Nutrient over-enrichment can lead to organic loading and eutrophic conditions in the water column and benthos. Eutrophication has been associated with the appearance of serious toxic algal blooms throughout the Atlantic EEZ. These external events alter the physical and chemical composition of the water column and can cause mortality to benthic and pelagic organisms. The term "toxic algal blooms" applies not only to toxic microscopic algae, but also to non-toxic macroalgae (i.e., seaweeds), which can grow uncontrollably and cause ecological impacts such as displacing indigenous species, altering habitat suitability, and depleting oxygen. However, long-term community and ecosystem changes are not likely because the community has adapted to their occurrence and, unless already stressed by other factors, can rebound. On the other hand, if unable to rebound, impacts include alterations of marine food chains through adverse effects on eggs, juvenile and adult marine invertebrates (e.g., corals, sponges), sea turtles, seabirds, and mammals.

Storm Surges and Wind Generated Waves

Storm surges and wind generated waves are external events that are likely to affect EFH through physical alteration of the bottom structure as well as chemical and physical modifications of the water column. However, unless the duration of these events is extensive, or they occur in conjunction with other events known to stress the environment, community and ecosystem changes typically are not realized.

9.4.4.3 Management Actions Affecting EFH

This section summarizes management actions influencing essential fish habitat. Management actions are defined as regulations and other specific management decisions that have the potential to mitigate alteration of the physical structure; direct mortality of benthic organisms; sediment suspensions; physical and chemical modifications to the water column; benthic community changes; and ecosystem changes. This section is divided into two sections: external management actions and internal management actions.

9.4.4.3.1 External Management Actions Affecting EFH

External management actions are those determinations or regulations that have been enacted by agencies or governments outside of the jurisdiction of NMFS and the Councils. These actions have the potential to affect EFH in either a positive or negative manner. The following past and present external management actions have the potential to impact EFH:

- the Clean Water Act;
- the Coastal Zone Management Act of 1972;
- the Marine Protection, Research, and Sanctuaries Act of 1972;

- the Oil Pollution Act of 1990; and
- international laws regarding marine pollution.

Descriptions of each action are provided in the section discussing the impact of water pollution on Atlantic large whales, Section 9.4.1.4.

9.4.4.3.2 Internal Management Actions Affecting EFH

Internal management actions are determinations or regulations that have been enacted by NMFS or the Councils. Internal actions that can clearly benefit EFH include measures such as area closures (depending upon size of area, time closed and habitat type within), gear restrictions/alterations, permitting restrictions, reductions in effort allowed or days at sea (DAS), and possession/trip limits. Some measures such as effort monitoring, crew limits, onboard observers, recreational measures, and Total Allowable Catch (TAC) limits may also benefit habitat. Other measures, such as an increase in fish and mesh size limits, although they are designed to meet stock rebuilding objectives, may have negative habitat effects since they may encourage increased fishing effort to meet catch limits if DAS are not limiting.

This section summarizes internal management actions in the Atlantic EEZ to protect EFH in the New England, Mid-Atlantic, and South Atlantic regions.

New England EFH Management Actions

The NEFMC is responsible for the management of fishery resources in Federal waters off Maine, New Hampshire, Massachusetts, Rhode Island and Connecticut. FMPs developed by the NEFMC include plans for Atlantic salmon, Northeast multispecies, sea scallop, Atlantic herring, and monkfish.

The first action from the New England Fishery Management Council came with the release of the Omnibus EFH Amendment of 1998 (the Omnibus). The Omnibus identified and described the EFH for all species managed by the Council to better protect, conserve, and enhance this habitat. The EFH descriptions and identifications for New England FMPs were approved on March 8, 1999 for Atlantic salmon (Amendment 1), Northeast multispecies (Amendment 11), and Atlantic sea scallop (Amendment 9). General provisions implemented through these FMP Amendments include:

- **Vessel Restrictions**: This measure limits the horsepower and size of fishing vessels being replaced or upgraded.
- **Gear and Crew Restrictions**: Restricts the number of crew allowed on a vessel; has an indirect habitat effect by limiting effort.

- **Days-at-Sea Allocations**: Limits overall fishing time and indirectly protects habitat by causing an overall reduction of fishing effort associated with the gears and methods likely to affect habitat.

- **Closed Areas**: Numerous fishery closures and/or restrictions that protect benthic habitat exist in the EFH of various NEFMC-managed fisheries.

Since initial implementation of the Omnibus EFH provisions, the Council has approved or is in the process of reviewing and approving the following measures to protect EFH associated with New England fisheries:

- **Amendment 13 to the Northeast Multispecies FMP**: Significant measures implemented to protect essential fish habitat for the groundfish fishery include effort reductions through significant DAS reductions and seasonal closures, as well as closure of habitat areas to all bottom-tending mobile gear.

- **Amendment 10 to the Atlantic Sea Scallop FMP**: Significant measures implemented to protect essential fish habitat for the sea scallop fishery include effort reductions through significant DAS reductions and rotation management; closure of habitat areas to scallop dredge gear; and gear modifications.

- **Framework 16/39 for the Sea Scallop/Northeast Multispecies FMPs**: A significant portion of this framework is devoted to designating the boundaries for habitat closed areas so that the areas are the same for both fisheries, which is not the case under Amendments 10 and 13.

- **Amendment 2 to the Monkfish FMP**: Significant measures to minimize the impacts of gear effects on monkfish EFH include gear modifications and closed areas.

The guidelines implementing the MSA's EFH provisions require the Councils to review and revise EFH components of FMPs at least once every five years. On February 24, 2004, the New England Fishery Management Council, in cooperation with NMFS, published an intent to prepare a programmatic EIS and Omnibus Amendment to the FMPs for Northeast Multispecies, Atlantic Sea Scallop, Monkfish, Herring, Skates, Atlantic Salmon and Red Crab. The Omnibus Amendment will review the EFH components of all the FMPs managed by the Council, including:

- The identification and consideration of new Habitat Areas of Particular Concern (HAPCs) and Dedicated Habitat Research Areas (DHRA);

- The integration of alternatives to minimize any adverse effects of fishing on EFH for all species managed by the Council; and

- An analysis of the impacts of any proposed management measures.

In September 2005, NMFS and NEFMC published a supplemental Notice of Intent to propose a two-phase approach (70 FR 53636). As proposed, the first volume of the EIS will review and update EFH designations and HAPCs; this volume will also update non-fishing impacts and review research and information needs. The second volume of the EIS will review and update existing gear effects evaluations and associated management measures for reducing impacts on EFH.

Mid-Atlantic EFH Management Actions

The MAFMC is responsible for the management of fishery resources in Federal waters off New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. The description and identification of EFH and HAPCs for MAFMC managed species were approved on April 28, 1999 for Atlantic surfclam and ocean quahog (Amendment 12); Atlantic mackerel, squid and butterfish (Amendment 8); and summer flounder, scup, and black sea bass (Amendment 12). EFH descriptions and identifications for Atlantic bluefish (Amendment 1) were approved on July 29, 1999. Spiny dogfish EFH descriptions and identifications were approved on September 29, 1999, and tilefish EFH descriptions and identifications were approved on May 10, 2001.

The Council has implemented many regulations that have indirectly acted to reduce fishing gear impacts on EFH. For fisheries designated as overexploited, a number of management measures have been implemented that result in a reduction of fishing effort, such as harvest limits, gear restricted areas, and gear restrictions. These measures translate to a reduction in gear impacts that can adversely affect habitat.

South Atlantic EFH Management Actions

The SAFMC is responsible for the management of fishery resources in Federal waters off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West. The description and identification of EFH and HAPCs for SAFMC managed species were approved on June 3, 1999 in the Comprehensive Habitat Amendment for snapper/grouper (Amendment 10); Atlantic coast red drum (Amendment 1); Atlantic shrimp fishery (Amendment 3); Atlantic coral, coral reefs, and live/hard bottom habitats (Amendment 4); Atlantic golden crab (Amendment 1); spiny lobster (Amendment 5); and the coastal migratory pelagics fishery (Amendment 10).

The SAFMC has taken a leading role in the protection of habitat essential to managed species in the South Atlantic. Examples of regulations that directly and indirectly impact South Atlantic EFH include:

- **Amendment 4 to the FMP for Coral, Coral Reefs, and Live/Hard Bottom Habitats**: Through the implementation of the Coral FMP, and subsequent amendments to that plan, the Council has protected coral, coral

reefs, and live/hard bottom habitat in the South Atlantic region. Significant measures implemented in this plan include establishing an optimum yield of zero and prohibiting all harvest or possession of these resources, which serve as essential fish habitat to many managed species.

- **Oculina Bank Habitat Area of Particular Concern**: Another significant measure implemented by the SAFMC is the designation of Oculina Bank as a HAPC. Oculina Bank is a unique and fragile deepwater coral habitat off southeast Florida that is protected from damage by all bottom tending fishing gear.

- **Amendment 10 to the FMP for the Snapper-Grouper Fishery**: To protect EFH, the snapper-grouper FMP prohibits the use of the following gear: bottom longlines in the EEZ inside of 50 fathoms or anywhere south of St. Lucie Inlet, Florida; fish traps; bottom tending (roller-rig) trawls on live bottom habitat; and entanglement gear.

Other actions taken by the Council that directly or indirectly protect habitat or ecosystem integrity include the prohibition of rock shrimp trawling in a designated area around the Oculina Bank; mandatory use of bycatch reduction devices in the penaeid shrimp fishery; a prohibition on the use of drift gill nets in the coastal migratory pelagic fishery; and a mechanism that provides for the concurrent closure of the EEZ to penaeid shrimping if environmental conditions in state waters are such that the overwintering spawning stock is severely depleted.

The SAFMC is currently engaged in a review of all EFH information for South Atlantic fisheries. As was done in developing the original 1998 Habitat Plan, Council habitat staff are conducting a series of technical workshops. The purpose of these workshops is to review the information presented in the 1998 Habitat Plan and update EFH information as necessary. In particular, SAFMC efforts are aimed at integrating comprehensive details of habitat distribution and the biology of managed species, including the characteristics of the food web in which managed species exist. In addition to the workshop process, a revision and update of existing habitat policies and the development of new policies is also being coordinated.

9.4.4.4 Summary of Factors Affecting Habitat

Exhibit 9-23 summarizes the major past, present, and reasonably foreseeable future management actions that may affect essential fish habitat.

Exhibit 9-23

SUMMARY OF FACTORS AFFECTING HABITAT

Potential Effects on Habitat[1]	Major Past, Present and Reasonably Foreseeable Future (PPRFFAs) Actions	Effect of PPRFFAs
Alteration of physical structure	• External management actions include the CWA, CZMA, MPRSA, OPA, and international laws • Management actions have been taken by all fishery management councils in New England, the Mid-Atlantic, and the South Atlantic. Examples of actions taken include area closures, gear restrictions, and effort reductions. The NEFMC and the SAFMC will be reviewing and revising the EFH components of all FMPs under their authority in the near future.	Positive
Mortality of benthic organisms		
Changes to the benthic community and ecosystem		
Sediment suspension		
Trap loss and ghost fishing		

Notes:
[1] The potential impacts analyzed here are outlined in further detail in Section 4.4.

9.4.5 Fishing Dependent Communities

This section examines the impact of past, present, and reasonably foreseeable future management actions on the communities that are engaged in ALWTRP-regulated fisheries. Nine of the twelve affected fisheries are discussed:[63]

- American lobster;
- Northeast multispecies;
- Monkfish;
- Spiny dogfish;
- Shark;
- Coastal migratory pelagic species;
- Black sea bass;
- Red crab; and
- Scup.

For each of the fisheries, the discussion of fishing dependent communities is organized into two sections:

- The first presents a summary of fishing communities engaged in the fishery.

[63] The remaining three fisheries, hagfish, Jonah crab, and conch/whelk, are not yet regulated under the MSA and thus, have experienced no significant management actions. In all three cases, however, increased pressure on the resource due to the movement of vessels into the fishery could prompt development of a fishery management plan in the near future.

- The second summarizes the impact of past, present, and reasonably foreseeable future management actions on fishing dependent communities.

The information presented in this section is based primarily on fishery management plans prepared by the National Marine Fisheries Service and the fishery management councils, including the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (MAFMC), the South Atlantic Fishery Management Council (SAFMC), and the Atlantic States Marine Fisheries Commission (ASMFC).

9.4.5.1 American Lobster

Lobster has consistently ranked among the Atlantic coast's most commercially important species. In 2001, American lobster contributed the greatest percentage of the region's total ex-vessel fishing revenue, accounting for 21 percent of Atlantic coast revenue and 37 percent of New England revenue. Landings over the past decade have increased from about 60 million pounds in the early 1990s to 81 million pounds in 2002. This dramatic increase is due to several factors, including an increase in the total area and number of traps/pots fished; advancements in trap technology; and increased entrance of new fishermen into the lobster industry.[64] Scientists believe that the lobster resource is being overfished and that subsequent years of record high landings may push the fishery to collapse.

Fishing Communities

In the FSEIS for the most recent Federal lobster management action in 2002, NMFS used information from both the dealer and permit application databases to identify Northeast communities engaged in the lobster fishery. The analysis noted a total of 687 different places in which individuals engaged in lobstering reside, receive mail, moor a vessel, or land lobster. Maine had the largest number of locations (227) that may be engaged in the lobster fishery, followed by Massachusetts (169), New Jersey (78), and New York (69). Consistent with these findings, analysis of 2002 dealer data indicates that the top ports for lobster landings are located in Maine (Vinalhaven, Stonington, and Portland), but that lobster is landed in numerous ports, both large and small, throughout New England and the Mid-Atlantic.

Effects of Management Actions on Fishing Dependent Communities

The American lobster fishery is governed through both interstate (ASMFC) and Federal management systems (NMFS). Addendum I to the Interstate Fishery Management Plan under the ASMFC went into effect in August 1999. This action established a trap limit of 800 traps per vessel for LMA 1 (the Northern New England coast) and controls on fishing effort in LMAs 3, 4,

[64] Advancements in trap technology include a switch to more effective wire traps instead of wood traps; increased trap size; changes in trap design (most notably the rise of “double parlor” traps); and increased soak time (ASMFC, 1997).

and 5.[65] On March 27, 2003, NMFS issued a final rule implementing Federal regulations consistent with Addendum I. Major provisions implemented in this action include:

- Limits on the number of vessels to be issued Federal lobster permits, based on historical participation criteria.

- Controls on fishing effort by limiting vessels permitted to fish in LMAs 4 and 5 to a maximum of 1,440 traps each; limiting those permitted to fish in the Federal waters of LMA 1 to a maximum of 800 traps each; and establishing a four-year trap reduction schedule in LMA 3.

From a socioeconomic standpoint, the most significant of these provisions is the trap reduction schedule implemented in LMA 3. Under Addendum I, the number of traps fished by Federal permit holders in LMA 3 will be reduced from an estimated 105,821 traps in Year 1 to 96,419 traps in Year 4. The plan contains an initial cap of 2,656 traps per vessel. Vessels that were previously allocated more than 1,200 traps will see their allocations reduced over a four-year period. These reductions will be implemented on a sliding scale, based on historical participation, and will provide each vessel a minimum allocation of 1,200 traps. Vessels that were previously allocated fewer than 1,200 traps (approximately 11 percent of qualifying vessels) are capped at historic qualifying levels, and will not be permitted to exceed this limit in future years. These provisions will reduce the number of traps fished by approximately 20 to 35 percent relative to 1997 and 1992 levels, respectively.

The LMA 3 trap reduction schedule was designed to mitigate the socio-economic impacts of this action to reduce fishing effort. Specifically:

- The trap reduction schedule was designed to maintain the permit holder's market share at historic levels; and

- Trap reductions are imposed over a four-year period in an effort to soften the economic impact and minimize sudden and immediate financial hardship.

While it is difficult to discern the overall socioeconomic impacts of these restrictions, it is clear that the lobster fishery is unlikely to continue the growth and revenue trends realized in the 1990s. Additional restrictions on access and reductions in effort are expected to continue in order to prevent overexploitation of the lobster resource. Fishermen and fishing communities active and/or dependent on the lobster resource in LMA 2 and 6 may be particularly vulnerable to increased regulatory costs as a result of the 1999 mass mortality event in LIS.

[65] This action and all interstate actions under the ASMFC are not bound by Federal regulations to conduct an environmental impact statement under the National Environmental Policy Act (NEPA). Therefore, no Federal analyses of the economic or social impacts of these actions were prepared.

9.4.5.2 Northeast Multispecies

For centuries, Atlantic groundfish stocks have supported a fishery that has served to shape the economy and culture of New England. Development of advanced gear technologies, electronic navigation, fish-finding tools, and increased vessel power during the 20th century greatly expanded the New England groundfish fishery. In response to these pressures, Amendment 5 (1994) to the Multispecies FMP capped fishery participation and established additional measures to reduce fishing effort. Subsequently, between 1995 and 2000, commercial landings of groundfish increased 19.4 percent. The value of commercial groundfish landings in the year 2002 was approximately $114 million.

Since the implementation of Amendment 5 in 1994, the aggregate biomass of New England groundfish stocks has nearly tripled, increasing from 161,217 metric tons (mt) in 1994 to 451,346 metric tons in 2000 (NEFMC, 2004b). Among the species that have demonstrated dramatic increases since 1994 are Georges Bank haddock, yellowtail flounder, and winter flounder. For other stocks, however, little progress has been made, as harvest levels remain too high and further regulations are required to reduce fishing mortality. The stocks requiring the largest reduction in fishing mortality are Gulf of Maine cod, Georges Bank cod, Cape Cod/Gulf of Maine yellowtail flounder, Southern New England/Mid-Atlantic yellowtail flounder, Southern New England/Mid-Atlantic winter flounder, white hake, and American plaice (NEFMC, 2003a).

Fishing Communities

The multispecies fleet is dominated by vessels with home ports in Massachusetts and Maine. In general, larger vessels have home ports in southern states (North Carolina, Virginia, and Florida) while smaller vessels are based in northern states (Massachusetts, New Hampshire, and Maine). Fleet composition by state remained relatively constant in the groundfish fishery from 1996 to 2001 (Exhibit 9-24).

Exhibit 9-24

NORTHEAST MULTISPECIES FLEET COMPOSITION BY HOME PORT STATE[1]

State	Average Percent of Total Vessels 1996-2001	1996	1997	1998	1999	2000	2001
Massachusetts	51.1%	716	655	639	638	652	687
Maine	12.6%	188	179	158	140	153	163
Rhode Island	10.6%	122	124	132	138	126	137
New York	9.7%	123	135	134	128	123	116
New Jersey	6.2%	86	80	80	94	84	58
New Hampshire	5.9%	75	65	74	70	90	90
Virginia	1.5%	15	21	24	26	18	9
North Carolina	1.4%	13	16	20	17	18	27
Connecticut	0.6%	3	3	6	2	17	17
All Others	Each less than 1 %	13	11	11	12	15	10
TOTAL:		**1354**	**1289**	**1278**	**1265**	**1296**	**1314**

Notes:
[1] Numbers reflect permitted multispecies vessels that are active in the groundfish fishery.

Source: NEFMC, 2003b.

Total groundfish landings were highest for Massachusetts vessels in all years from 1996 to 2001 (Exhibit 9-25). For the most part, revenues reflect landings trends and have generally increased in all states since 1996, with Massachusetts, Maine, New Hampshire, and Rhode Island generating the greatest groundfish revenue. About 60 percent of total groundfish landings from 1996 to 2001 were brought in by Massachusetts vessels, with another 20 percent landed by Maine vessels. Permitted multispecies vessels with home ports in some southern New England and Mid-Atlantic states, though contributing a high percentage of landings to the total, are less active than Maine and New Hampshire vessels in the groundfish fishery. States in southern New England and the Mid-Atlantic may be more dependent on non-groundfish fisheries such as scup, squid, mackerel and butterfish.

Examination of groundfish revenues as a percentage of total revenues indicates that New Hampshire fisheries are most heavily dependent on groundfish, with groundfish revenues increasing from 49 percent of total fishery revenues in 1996 to 60 percent in 1998, and decreasing to 48 percent in 2001 (Exhibit 9-26). The dependence of multispecies vessels from Maine on groundfish as a percent of total fishery revenues is second to that of New Hampshire vessels. Delaware vessels rank third in terms of dependence, followed by Massachusetts and Connecticut.

In the FSEIS for the proposed regulations to implement Amendment 13 to the Multispecies Fishery Management Plan, NMFS examined groundfish landings by port from 1994 to 1999 to identify primary and secondary communities engaged in the groundfish fishery. Primary communities are identified as those substantially engaged in the groundfish fishery based on historical participation and landings and which are most likely to be affected by any groundfish measures under Amendment 13. Secondary communities are those that may not be substantially dependent or engaged in the groundfish fishery, but have demonstrated some

participation in the fishery since the 1994 fishing year. Exhibit 9-27 provides a summary of the available information on these primary and secondary communities.

Exhibit 9-25

GROUNDFISH LANDINGS BY MULTISPECIES VESSELS BY HOME PORT STATE (1996-2001)[1]

State	1996	1997	1998	1999	2000	2001
Massachusetts	46,313	46,983	42,312	42,767	50,724	61,687
Maine	15,284	14,180	13,306	13,188	18,047	21,139
New Hampshire	4,279	4,080	4,267	3,232	4,535	5,029
Rhode Island	2,972	4,213	6,142	6,090	8,486	8,666
New York	1,323	1,369	2,445	2,916	4,096	3,069
New Jersey	925	346	952	1,375	1,844	1,095
Delaware	835	882	831	952	988	796
Virginia	212	119	398	407	431	829
Connecticut	37	3	141	174	820	758
North Carolina	15	321	732	360	798	1,254
All Others	188	238	122	53	6	2
TOTAL:	**72,383**	**72,734**	**71,648**	**71,514**	**90,775**	**104,324**

Notes:
[1] Data are for multispecies permit holders only for fishing year May 1 to April 30. Landings expressed in thousands of pounds.

Source: NEFMC, 2003b.

Exhibit 9-26

DEPENDENCE OF MULTISPECIES VESSELS ON GROUNDFISH REVENUES BY HOME PORT STATE (1996-2001)

State	1996	1997	1998	1999	2000	2001
New Hampshire	49.3%	52.5%	59.6%	50.6%	48.4%	48.1%
Maine	43.2%	42.4%	50.6%	45.9%	50.9%	55.0%
Delaware	42.2%	40.1%	38.0%	38.0%	59.8%	63.0%
Massachusetts	35.1%	40.8%	41.3%	33.4%	31.7%	34.9%
Connecticut	20.7%	0.4%	36.4%	41.2%	21.3%	12.6%
New York	8.6%	7.4%	11.7%	14.1%	17.6%	14.1%
Rhode Island	8.1%	10.0%	15.9%	12.8%	18.3%	21.0%

Source: NEFMC, 2003b.

Exhibit 9-27

NORTHEAST MULTISPECIES FISHING COMMUNITIES

Area (Counties)	Primary Ports	Number of Secondary Ports
Downeast Maine (Washington County)	None	7
Upper Mid-Coast Maine (Hancock, Waldo, and Knox Counties)	None	15
Lower Mid-Coast Maine (Lincoln, Sagadahoc, and Cumberland Counties)	Portland	22
Southern Maine (York County)	None	9
State of New Hampshire (Rockingham and Strafford Counties)	Portsmouth	4
Gloucester and North Shore, MA (Essex County)	Gloucester	8
Boston and South Shore, MA (Middlesex, Suffolk, Norfolk, and Plymouth Counties)	Boston	3
Cape and Islands, MA (Barnstable, Dukes, and Nantucket Counties)	Chatham/ Harwichport	12
New Bedford Coast, MA (Bristol County)	New Bedford/ Fairhaven	2
State of Rhode Island (Washington and Newport Counties)	Point Judith	10
State of Connecticut (New London, Middlesex, New Haven, and Fairfield Counties)	None	8
Northern Coastal New Jersey (Monmouth and Ocean Counties)	None	8
Southern Coastal New Jersey (Atlantic and Cape May Counties)	None	7
TOTAL:	**7**	**115**

Source: NEFMC, 2003b.

Effects of Management Actions on Fishing Dependent Communities

A review of 21 management actions since the first Multispecies FMP in 1977 shows a series of provisions and restrictions that have resulted in moderate to high adverse impacts on fishing dependent communities. Beginning in 1994 with Amendment 5, seven management actions have been implemented with high adverse impacts on fishing dependent communities. The significant provisions implemented in these actions have included drastic cuts in days-at-sea allocations, trip limits, and fishing closures. Exhibit 9-28 presents a summary of 21 management actions from 1977 to 2002 resulting in moderate to high adverse impacts on fishing dependent communities. Exhibit 9A-4 in Appendix 9-A presents this information in more detail with a summary of the significant regulatory provisions implemented in each management action.

Exhibit 9-28

CATEGORIZATION OF ACTIONS BY THE LEVEL OF IMPACT ON FISHING DEPENDENT COMMUNITIES (1977-2002)

Level of Impacts	Management Actions
Moderate	• Multispecies Plan (1986) • Emergency Action (1994) • Amendment 6 (1994) • Framework 20 (1997) • Framework 24 (1998) • Framework 26 (1999) • Interim Rule (1999) • Amendment 9 (1999) • Framework 31 (2000) • Framework 33 (2000)
Moderate-to-High	• Original FMP (1977) • Interim Plan (1982) • Amendments 1 – 4 (1987-1991) • Framework 27 (1999)
High	• Amendment 5 (1994) • Emergency Action (1994) • Framework 9 (1995) • Amendment 7 (1996) • Framework 25 (1998) • Interim Action – Settlement Agreement Part I (2002) • Interim Action – Settlement Agreement Part II (2002)

Source: NEFMC, 2003b.

A final rule implementing the measures in Amendment 13 to the Northeast Multispecies FMP became effective on May 1, 2004. The analysis of economic impacts presented in the Final Supplemental Environmental Impact Statement (FSEIS) made the following conclusions about the impact of Amendment 13 on fishing dependent communities:

- Those vessels or communities that are most dependent on groundfish will be most affected by the proposed action. These communities include the ports of Boston, Chatham/Harwichport, New Bedford, Portland, and Upper Mid-Coast Maine.

- Median revenue losses for gillnet and hook gear, expected to be 9.7 and 7.7 percent respectively, are much lower than for trawl gear, with an expected median revenue loss of 22.7 percent.

- Twenty-five percent of the vessels that claim Maine, New Hampshire, or Massachusetts as a homeport will lose at least one-third of gross revenues.

- For those vessels that rely on groundfish for seventy-five percent or more of their fishing revenue, the median expected revenue loss is thirty-five percent.

- Looking at impacts on vessels by size, the FSEIS concluded that the proposed action would have larger revenue impacts on large as compared to smaller vessels.

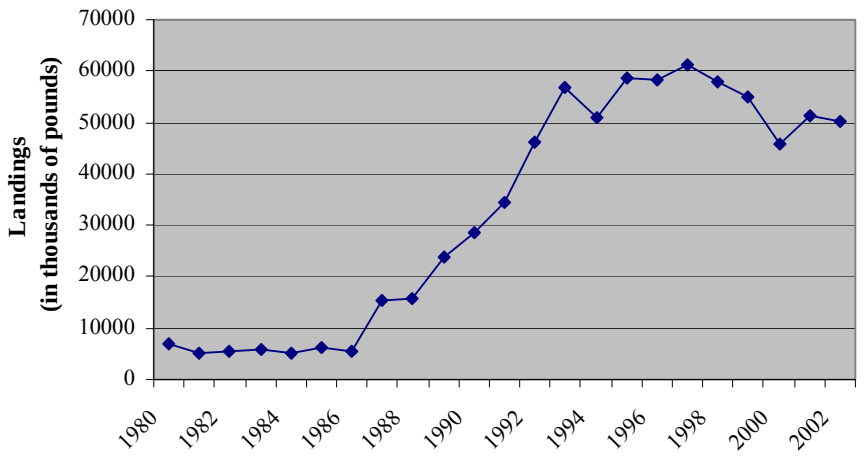
More specifically, gillnet gear groups would seem to be split between vessels that may experience significant revenue losses and vessels that may experience revenue gains. This disparity is likely due to differences in dependence on Georges Bank cod and Gulf of Maine cod. Because cod tends to represent a higher proportion of total fishing income for gillnet vessels, revenue is very sensitive to changes in cod trip limits. Thus, while the Gulf of Maine cod trip limit would be double that of FY2001, the Georges Bank cod trip limit is more restrictive. This means that gillnet vessels with a high dependence on Gulf of Maine cod can increase total fishing income despite the large DAS reduction, while vessels with high dependence on Georges Bank cod experience revenue losses.

9.4.5.3 Monkfish

Traditionally, monkfish was taken as incidental catch in the groundfish and sea scallop fisheries, having little to no commercial value. Beginning in the late 1980s, commercial landings in the monkfish fishery increased dramatically in response to an increase in the market value of the species, combined with a decline in the abundance of traditional New England species (Exhibit 9-29).

Exhibit 9-29

MONKFISH LANDINGS 1980-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

Concern over management of the monkfish resource first arose in the early 1990s. In 1997, a stock assessment for the monkfish resource concluded the stock was over-exploited. The 2006 NEFMC Monkfish Stock Assessment and Fishery Evaluation (SAFE) report reviewed the status of the monkfish resource and found that monkfish are overfished in both the northern and southern areas (NEFMC/MAFMC, 2006).

Fishing Communities

Because of the nature of the monkfish fishery, the vessels and communities involved with it overlap with those involved with the multispecies (groundfish) and scallop fisheries. Many vessels that target monkfish or catch them incidentally also target groundfish or scallops. All but six percent of the limited access monkfish permit holders hold limited access multispecies or scallop permits.

The Monkfish SAFE report identifies both primary and secondary monkfish communities. Primary monkfish ports are defined as those averaging more than $1 million in monkfish revenues from 1994 to 1997 (based on dealer weighout data). Secondary communities are defined as those that averaged more than $50,000 in monkfish revenues from 1994 to 1997. Exhibit 9-30 summarizes the primary and secondary monkfish ports identified in the Monkfish SAFE report.

Exhibit 9-30

PRIMARY AND SECONDARY MONKFISH PORTS

Primary Ports	Secondary Ports
• New Bedford, MA • Portland, ME • Point Judith, RI • Gloucester, MA • Long Beach, NJ • Boston, MA	• Rockland, ME • Port Clyde, ME • South Bristol, ME • Ocean City, MD • Chatham, MA • Provincetown, MA • Scituate, MA • Plymouth, MA • Westport, MA • Portsmouth, NH • Point Pleasant, NJ • Cape May, NJ • Greenport, NY

Source: NMFS, 2002d.

Effects of Management Actions on Fishing Dependent Communities

In 1998, NMFS approved the first Monkfish FMP with the objective of eliminating overfishing and rebuilding monkfish stocks. The FMP adopts a rebuilding strategy that takes place over ten years.

The FMP relies primarily on the implementation of a series of annual days-at-sea allocations over four years to reduce fishing mortality on monkfish stocks. An analysis of the economic impacts of the DAS reduction according to the ten-year rebuilding strategy was completed when the Monkfish FMP was approved in 1998. This analysis concluded that monkfish landings should be expected to be less than the status quo for eight years (i.e., from

1999 to 2007), until stock rebuilding allows for the harvest of higher yields. Gross revenues were also expected to decline, relative to status quo, through 2006, and then to begin recovering.

The analysis concluded that the majority of monkfish vessels (65 percent) would not experience a reduction in gross revenues of more than five percent. A reduction in gross revenues of more than 35 percent, however, was expected for 9.9 percent (139 vessels) of affected vessels (Exhibit 9-31). Of these, approximately 80 percent were based in Massachusetts (45), New Jersey (32), Rhode Island (21), or New York (12). The two ports identified as the hardest hit with the greatest number of "at-risk" vessels were New Bedford, Massachusetts and Barnegat Light, New Jersey, with 15 vessels and 13 vessels expected to experience revenue losses of 35 percent or more, respectively. Among "at-risk" vessels, 60 percent (84 vessels) used gillnet gear for the majority of their revenues, and most gillnet vessels (76) were vessels less than 50 gross register tons (GRT).

Exhibit 9-31

NUMBER OF MONKFISH VESSELS BY GROSS REVENUE LOSS INTERVAL

Revenue Loss Interval	Number of Vessels
0% to 4%	923
5% to 14%	211
15% to 24%	100
25% to 34%	28
35% to 44%	27
45% to 54%	18
> 55%	94

Source: NMFS, 1998.

9.4.5.4 Spiny Dogfish

The spiny dogfish traditionally was considered an "under-utilized" species of relatively minor value to the domestic fisheries of the U.S. Atlantic Coast. With the decline of the groundfish fishery in recent years, an increase in directed fishing for dogfish resulted in a nearly ten-fold increase in landings from 1987 to 1996.

On April 3, 1998, NMFS declared spiny dogfish overfished. The agency approved the first Spiny Dogfish FMP on September 29, 1999 (effective April 3, 2000). To reduce fishing mortality, the Spiny Dogfish FMP contains a restrictive rebuilding schedule allowing only limited, incidental catch of dogfish until the stock is rebuilt. For the period from May 1, 2000 through April 30, 2002, the annual quota was set at 4 million pounds, with trip limits of 600 pounds and 300 pounds for quota periods I and II, respectively. NMFS proposed the same annual quota and trip limits for the 2003 fishing year beginning May 1, 2003.

Fishing Communities

Spiny dogfish are landed in every state from Maine to North Carolina. However, prior to 1990, Massachusetts was responsible for the vast majority of commercial spiny dogfish landings. Beginning in 1989 (as the U.S. fishery expansion began), dogfish landings in the states of New Jersey, Maryland and Maine began to increase in importance. By 1996, the expansion of the spiny dogfish fishery had occurred in virtually every state in New England and the Mid-Atlantic, especially in North Carolina.

Several states historically landed the majority of spiny dogfish. Average landings for each state from 1988 to 1997 were as follows: Massachusetts, 55 percent; North Carolina, 16 percent; Maryland and Maine, 7 percent each; and New Jersey, 5 percent. In total, these states landed 90 percent of the spiny dogfish from 1987 to 1996. Exhibit 9-32 shows the four major ports that landed 44 percent of all spiny dogfish coastwide in 1996.

Exhibit 9-32

MAJOR SPINY DOGFISH PORTS

1996		2000	
Port	**Percent of Coastwide Landings**	**Port**	**Percent of Coastwide Landings**
Chatham, MA	14%	Chatham, MA	21%
Plymouth, MA	12%	Pt. Pleasant, NJ	17%
Ocean City, MD	12%	Hampton Bay, NY	9%
Gloucester, MA	6%	Portsmouth, NH	8%
TOTAL:	44%	TOTAL:	55%

Source: MAFMC, January 2002.

In 2000, the focus of the fishery shifted somewhat. Five states accounted for 90 percent of the landings made that year, as follows: Massachusetts (28.5 percent), New Jersey (25.8 percent), North Carolina (14.1 percent), New Hampshire (11.5 percent), and New York (9.4 percent). As shown in the above exhibit, the top four ports for spiny dogfish in 2000 were Chatham, MA; Pt. Pleasant, NJ; Hampton Bay, NY; and Portsmouth, NH.

Effects of Management Actions on Fishing Dependent Communities

The rebuilding schedule identified in the Spiny Dogfish FMP is expected to eliminate overfishing and rebuild the spiny dogfish stock in the shortest possible time. The management measures required to achieve this goal, however, are expected to have significant economic consequences for the fishery. The FMP establishes an annual quota on landings that will be maintained at under 4.4 million pounds until the target biomass is reached. According to the EIS for the FMP, this quota would result in a 30 percent reduction in landings in Year 1, leading to a decrease in gross revenues of greater than five percent for approximately 149 vessels and two processors. In Year 2, the quota will impose an 89 percent reduction in total landings (relative to the status quo) and 232 harvesters would face a reduction of revenues greater than five percent. The decline in landings could force at least 12 spiny dogfish harvesters to cease operations. In addition, the decline in volume would hamper processors' ability to process spiny

dogfish in a cost-effective manner. This could result in the elimination of dogfish processing operations, the potential loss of approximately 200 jobs, and virtual elimination of the directed spiny dogfish fishery. These measures were deemed necessary, however, to restore the stock.

9.4.5.5 Directed Shark

In the Atlantic Ocean, the directed shark fishery is most active in southern waters. The most recent stock assessment found that: (1) the large coastal shark (LCS) complex is overfished and overfishing is occurring; (2) sandbar sharks are not overfished but overfishing is occurring; (3) the stock of blacktip sharks is rebuilt and healthy; (4) the small coastal shark (SCS) complex and stocks of Atlantic sharpnose, bonnethead, and blacknose sharks are healthy; and (5) finetooth sharks are not overfished but overfishing is occurring.

Fishing Communities

The shark fisheries of the Atlantic and Gulf coasts (excluding the fishery for dogfish) extend from Maine to Texas, and include Puerto Rico and the U.S. Virgin Islands. Although the geographic extent of the fishery is large, most of the fishery is concentrated in the waters off three states: Florida (51.8 percent of 2001 landings by weight), Louisiana (16.9 percent), and North Carolina (16.5 percent). Four other states, Virginia, New Jersey, South Carolina, and Mississippi, jointly accounted for an additional 12.8 percent of 2001 commercial landings.

In Amendment 1, NMFS identified that, in 2001, there were 255 communities involved in the commercial shark fishery (both directed and incidental). This number is based on an analysis of commercial landings data, dealer permit data, and vessel permit data. Communities where the majority of the directed shark fishery operates and where this fishery overlaps with the ALWTRP action area include the following:

- **North Carolina**. Licensed shark dealers operate in 52 locations in North Carolina, and 38 commercial fishing vessels have shark permits. Of the 19 directed-catch permits, 18 are for vessels fishing from Dare County, north of Cape Hatteras; the nineteenth vessel is from the Wilmington, NC area.

- **South Carolina**. Licensed shark dealers operate in 21 locations in South Carolina, and eight commercial fishing vessels have directed-catch permits. Communities involved with the commercial shark fishery include Charleston, Folly Beach, Garden City, Georgetown, Hampton, Ladson, McClellanville, Mount Pleasant, Murrels Inlet, North Myrtle Beach, and Pawleys Island. Approximately 83 percent of the South Carolina commercial shark catch by weight was landed in Charleston County, and 14 percent in Georgetown County.

- **Florida**. Directed-catch shark permits are held by 139 commercial vessels in Florida, with 65 boats operating from East Coast ports and 74 boats

based in West Coast ports. Licensed shark dealers operate in 106 locations in Florida, with 47 locations in East Coast communities and 59 locations in West Coast communities. In 2001, the commercial catch of shark was split relatively evenly between the two coasts, with 55 percent by weight landed on the East Coast. The greatest concentration of commercial landings on the East Coast in 2001 was in Brevard County, followed by St. Lucie County and Duval County, respectively. Fort Pierce (in St. Lucie County) has the greatest concentration of vessels, with 19 commercial boats, while Jacksonville (Duval County), Dania (Broward County), and Port Salerno (Martin County) each had seven vessels.

Effects of Management Actions on Fishing Dependent Communities

The most recent management action in the directed shark fishery is FMP Amendment 1, published on December 24, 2003 with an effective date of February 1, 2004. Major actions under this rule include: aggregating the large coastal shark complex; using maximum sustainable yield as a basis for setting commercial quotas; eliminating the commercial minimum size; establishing regional commercial quotas and trimester commercial fishing seasons; introducing updated gear restrictions; and establishing a time/area closure off the coast of North Carolina.

For most of the actions implemented in Amendment 1, the adverse impacts identified in the FEIS were minor. Establishing trimester seasons could have short-term social and economic impacts because it will require some fishermen to alter traditional fishing practices. However, over time, trimester seasons are expected to have a positive impact, spreading the fishing season throughout the year. Amendment 1 requires fishermen to buy and use release equipment such as dipnets, line cutters, and dehooking devices. The total cost of this equipment should be minimal and would only be incurred once for all fishermen.

Some of the provisions implemented under Amendment 1 could have significant adverse economic impacts, particularly on small entities and in the short-term. These provisions could cause some vessel owners to go out of business. The time/area closure could directly affect fishermen in Virginia, North Carolina, and South Carolina (approximately 13 vessels) and would require them to either change fishing areas or stop fishing during the closure.

Amendment 1 results in a lower LCS commercial quota than reported annual landings in recent years. This required reduction in landings could have a negative impact on income derived from the LCS portion of the fishery. However, the SCS commercial quota is higher than recent annual landings and could help to mitigate the reduction in LCS landings.

Because the majority of shark fishermen hold permits in other fisheries and fish in other fisheries at least part of the year, fishermen who are adversely affected could increase participation in other fisheries in which they already participate. For some vessels, however, particularly bottom longline fishermen in the Mid-Atlantic and drift gillnet fishermen, exiting the fishery might be their only option.

9.4.5.6 Coastal Migratory Pelagic Species

The Coastal Migratory Pelagic Species Fishery is based primarily in waters off the southeastern United States. Annual landings in the coastal migratory pelagic species fishery have remained relatively stable since 1999 at approximately 6 million pounds.[66] According to a recent status report, none of the species in the Atlantic region of the coastal migratory pelagic species fishery is classified as overfished (NMFS, 2002e). However, in 2005, NMFS adopted Amendment 15 to the FMP for Coastal Migratory Pelagic Resources. The amendment defined a limited access system and made permanent what had previously been a temporary moratorium on king mackerel permits.

Fishing Communities

According to NMFS southeast logbook landings data, in 2002, coastal migratory pelagic species were landed in 26 counties from North Carolina to Florida. To assess the importance of coastal migratory pelagic species in these areas, Exhibit 9-33 notes the contribution of coastal migratory pelagic species to total landings in each county. Landings of coastal migratory pelagic species contributed more than ten percent of total landings for the majority of counties (17 out of 26). As the exhibit shows, the majority of effort in the fishery is in Florida, with 11 counties reporting coastal migratory pelagic species landings. North Carolina follows closely with nine counties, then South Carolina and Georgia with three counties each.

[66] This figure is based on landings reported in the Atlantic region of the fishery only: North Carolina, South Carolina, Georgia, and Florida East Coast.

Exhibit 9-33

LANDINGS OF COASTAL MIGRATORY PELAGIC SPECIES BY COUNTY (2002)

State	County	CMP Landings	Total Landings	Percent of Total Landings
GA	GLYNN	377	419	90.2%
FL	INDIAN RIVER	424,795	472,061	90.0%
FL	MARTIN	411,785	540,261	76.2%
FL	PALM BEACH	633,587	854,933	74.1%
NC	HYDE	11,501	19,333	59.5%
FL	ST LUCIE	582,848	1,115,122	52.3%
FL	BREVARD	637,547	1,276,155	50.0%
NC	NEW HANOVER	233,527	509,429	45.8%
GA	CHATHAM	5,149	11,405	45.2%
FL	BROWARD	43,160	105,263	41.0%
FL	DADE	114,313	291,378	39.2%
NC	DARE	590,951	1,604,194	36.8%
NC	PENDER	27,252	85,331	31.9%
FL	VOLUSIA	91,185	397,966	22.9%
FL	NASSAU	5,333	28,041	19.0%
NC	LEE	34	204	16.7%
NC	ONSLOW	34,495	301,460	11.4%
SC	CHARLESTON	26,779	304,711	8.8%
NC	BRUNSWICK	47,339	643,885	7.4%
NC	CARTERET	35,192	696,776	5.1%
FL	DUVAL	25,439	778,618	3.3%
SC	GEORGETOWN	31,940	1,003,264	3.2%
FL	ST JOHNS	6,039	191,689	3.2%
GA	MC INTOSH	14,480	509,633	2.8%
SC	HORRY	10,828	396,750	2.7%
NC	BEAUFORT	104	22,015	0.5%

Source: Analysis of NMFS Southeast Logbook landings data.

Effects of Management Actions on Fishing Dependent Communities

King and Spanish mackerel are major commercial species in Florida and North Carolina.[67] Since the mid-1980s, the fishing communities associated with the coastal migratory pelagic fishery have been subject to a series of management actions designed to reduce fishing mortality and rebuild overfished king and Spanish mackerel stocks. Implemented management actions have included TACs, trip limits, fish size limits, and gear restrictions. These management measures have succeeded in rebuilding the Atlantic migratory groups of king and Spanish mackerel into stocks no longer considered to be overfished. The most recent major management action in January 2000 reflects this change in the status of these fisheries. It included the following measures:

[67] Small amounts of king and Spanish mackerel are caught as incidental catch or a supplemental commercial target species off Georgia and South Carolina.

- An increase in the TAC for the Atlantic group king mackerel fishery from 8.4 million pounds to 10.0 million pounds. The new TAC includes a commercial allocation of 3.71 million pounds (37.1 percent) and a recreational allocation of 6.29 million pounds (62.9 percent).

- An increase in the TAC for the Atlantic group Spanish mackerel fishery from 6.6 million pounds to 7.04 million pounds. The new TAC includes a commercial allocation of 3.87 million pounds (55 percent) and a recreational allocation of 3.17 million pounds (45 percent).

- An increase in the trip limit for the Atlantic group king mackerel fishery in the Southern Zone (Brevard through Miami-Dade counties).

- Modification of the trip limit for the Atlantic group Spanish mackerel fishery in the Southern Zone (south of the Florida/Georgia boundary).

These actions are expected to result in positive economic and social impacts for South Atlantic mackerel fishermen.

9.4.5.7 Black Sea Bass

9.4.5.7.1 Northern Fishery

The northern portion of the black sea bass fishery extends from Cape Hatteras to the U.S./Canada border. Commercial landings of black sea bass decreased approximately 31 percent from 1984 to 1999, declining from 4.3 million pounds to less than 3.0 million pounds. Northern black sea bass is currently designated as overfished. In an effort to rebuild stocks, landings during the 2004 fishing year were limited to 3.75 million pounds.

Fishing Communities

Black sea bass accounts for only about 0.4 percent of ex-vessel commercial fishing revenues from North Carolina to Maine. The value of black sea bass landings relative to total revenues in 2000 ranged from less than one percent in most states to slightly over one percent in Delaware, Virginia, and North Carolina (MAFMC and ASMFC, 2002).

According to NMFS weighout landings data, in 1999, black sea bass was landed in 99 ports from Maine to North Carolina. In order to assess the importance of black sea bass to fishing dependent communities, NMFS considered the proportion or contribution of black sea bass to total revenue from all landings (fishing revenue dependence) in each port. Black sea bass accounted for less than five percent of total revenues at 84 of the 99 ports reporting black sea bass landings. Black sea bass accounted for five to ten percent of revenues at six ports and greater than ten percent of revenues at nine ports (MAFMC and ASMFC, 2002).

Effects of Management Actions on Fishing Dependent Communities

The first major management action for the Black Sea Bass fishery was implemented in 1998 under Amendment 9 to the Summer Flounder, Scup, and Black Sea Bass FMP. Amendment 9 established a quarterly commercial quota for the fishery, a necessary action to advance the recovery of the black sea bass stock. The Final Environmental Impact Statement (FEIS) for this action reviewed 1999 landing statistics to determine the reliance of key ports on black sea bass landings. Based on this information, the FEIS concluded that black sea bass landings were not of critical importance to the commercial fishing industry in the key ports identified.

Since the implementation of this action, however, significant social and economic impacts have resulted from Amendment 9. Although the quarterly quota system was designed to allow for landings in each of the four periods, early fishery closures occurred in the second, third, and fourth quarters of 1999 and 2000. In 2001, the black sea bass fishery was only open for approximately two months during a six-month period between July and December. The unintended result of the quarterly quota system has been a series of long closures associated with significant social and economic consequences for fishing communities. For example:

- Reduced or inconsistent streams of income can cause significant financial hardships for fishermen dependent on the black sea bass fishery;
- Fluctuating supply can result in decreased market demand;
- Short open periods for the fishery can result in "derby-style" fishing that promotes unsafe fishing practices (e.g., fishermen will fish in unsafe weather in order to catch "their share" of the quota); and
- Derby-style fishing practices may also favor larger, more mobile vessels that may be able to land more fish at the beginning of each period than smaller, less mobile vessels.

In addition, inter-regional inequities may have been created as a result of the coastwide quota system, with landings shifted to the north. For example, in the last quarter of 2000, Massachusetts accounted for 41 percent of black sea bass landings (MAFMC and ASFMC, 2002). A shift in abundance of black sea bass to the north could account for this concentration of landings; however, some fishermen have also indicated that the restrictive possession limits favored fishing operations in the north, where black sea bass are caught closer to shore.

To address the negative impacts of Amendment 9, the NEFMC initiated development of Amendment 13. Amendment 13, approved March 4, 2003, implemented a state-by-state allocation system of the annual commercial quota. This system allows for a more equitable distribution of the commercial quota without the additional burden of Federal monitoring by NMFS. In this system, states are allowed to design allocation programs based on possession limits and seasons that ensure a continuous and steady supply of fish throughout the year and/or establish a fair and equitable distribution of black sea bass to all fishermen who have traditionally landed black sea bass in their state. The FEIS concluded that this system is likely to

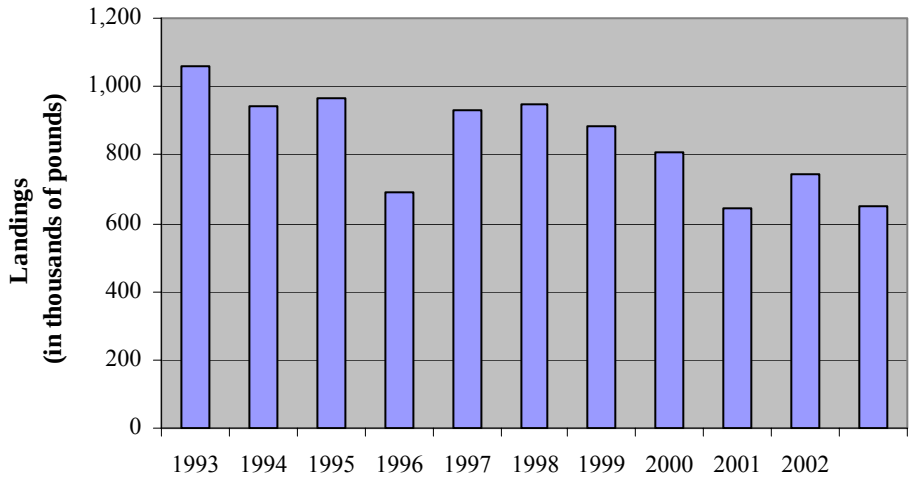
eliminate derby-style fishing and reduce the likelihood of seasonal closures. Amendment 13 is expected to have overall positive economic and social impacts to black sea bass fishing communities.

9.4.5.7.2 Southern Fishery

The southern portion of the black sea bass fishery extends from Cape Hatteras, NC to Cape Canaveral, FL, but the majority of the pot fishery is concentrated off North Carolina and northern South Carolina. The fishery has experienced a recent decline in landings (Exhibit 9-34). Based on a recent SAFMC stock assessment, the southern stock of black sea bass is heavily exploited.

Exhibit 9-34

SOUTHERN BLACK SEA BASS LANDINGS 1992-2002



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

Fishing Communities

According to NMFS southeast logbook landings data, in 2002, black sea bass was landed in 23 counties from North Carolina to Florida. Exhibit 9-35 indicates the contribution of black sea bass to total landings in each county. Landings of black sea bass contributed less than five percent of total landings in the majority of counties (15 out of 23). Black sea bass accounted for five to ten percent of landings in two counties, ten to 20 percent in four counties, and greater than 40 percent in two counties (Onslow, North Carolina and Beaufort, South Carolina).

According to southeast permit data for 2002, 42 fishermen hold black sea bass trap/pot permits from North Carolina to Florida. North Carolina leads the region with 22 permitted fishermen, followed closely by South Carolina with 17.

Effects of Management Actions on Fishing Dependent Communities

The most significant management action for the southern black sea bass fishery is Amendment 9 (1998). Amendment 9 implemented a total of ten actions for the snapper/grouper fishery; two of these actions were aimed at addressing the recent serious declines observed in black sea bass landings. The first action increased the black sea bass minimum size limit from 8 inches total length (TL) to 10 inches TL for both commercial and recreational fishermen. The FSEIS estimated a 26 percent reduction in the commercial catch of black sea bass from the implementation of a 10-inch TL minimum size limit. Using landings data for 1995, this size limit would produce a 161,506-pound reduction in commercial black sea bass landings in the first year, equivalent to $242,300 in total revenues (SAFMC, 1998).[68] The FSEIS for this action concluded that the increase in the fish size limit might require some commercial fishermen to substitute other species, or to compensate by increasing effort on black sea bass that meet the new size limit. Recently completed surveys with commercial snapper/grouper fishermen indicated that trap fishermen were, on average, older and had been in their current position longer than other snapper/grouper fishermen.[69] This suggests that these fishermen may have greater difficulty switching to other species or finding alternative sources of income, if necessary.

[68] This figure assumes an average ex-vessel price of $1.50 per pound.

[69] It was not known whether these differences were statistically significant.

Exhibit 9-35

LANDINGS OF BLACK SEA BASS BY COUNTY (2002)

State	County	BSB Landings	Total Landings	Percent of Total Landings
NC	ONSLOW	158,444	301,460	52.56%
SC	BEAUFORT	715	1,732	41.29%
GA	CHATHAM	1,825	11,405	16.00%
NC	CARTERET	98,239	696,776	14.10%
NC	NEW HANOVER	62,174	509,429	12.20%
NC	BRUNSWICK	64,973	643,885	10.09%
SC	HORRY	35,380	396,750	8.92%
NC	PENDER	4,466	85,331	5.23%
SC	CHARLESTON	10,028	304,711	3.29%
SC	GEORGETOWN	17,067	1,003,264	1.70%
NC	LEE	3	204	1.47%
NC	BEAUFORT	257	22,015	1.17%
NC	HYDE	187	19,333	0.96%
FL	NASSAU	232	28,041	0.83%
NC	DARE	8,610	1,604,194	0.54%
FL	VOLUSIA	1,514	397,966	0.38%
GA	MC INTOSH	1,333	509,633	0.26%
FL	DUVAL	1,663	778,618	0.21%
FL	PALM BEACH	265	854,933	0.03%
FL	ST JOHNS	58	191,689	0.03%
FL	BREVARD	208	1,276,155	0.02%
FL	INDIAN RIVER	70	472,061	0.01%
FL	MARTIN	38	540,261	0.01%

Source: Analysis of NMFS Southeast Logbook landings data.

The second action required escape vents and escape panels with degradable fasteners on all black sea bass pots. Escape vents would allow the release of fish below the minimum size limit, enhancing the survival of undersized fish that enter the pots. The use of degradable fasteners on escape panels would allow the doors or panels of black sea bass pots to fall away from unattended or lost pots, reducing the adverse effects of "ghost fishing." The cost of this second action included the materials required for installing escape vents and escape panels. Assuming an average cost of $4.00, the FSEIS estimated that black sea bass pot fishermen in North Carolina would incur an average cost of $140, while those in South Carolina would incur an average cost of $76 in the first year. NMFS did not anticipate any social impacts resulting from this action.

9.4.5.8 Red Crab

Since the early 1970s there has been a small directed red crab fishery off the New England and Mid-Atlantic coasts. Though the size and intensity of this fishery has fluctuated since its origin, it has remained consistently small relative to more prominent New England fisheries such as groundfish, sea scallops, and lobster. Throughout the 1980s, landings averaged

approximately 5.5 million pounds per year. In the mid-1990s, landings increased substantially, peaking in 2001 at 8.8 million pounds.

Fishing Communities

The directed commercial fishery for deep-sea red crab has relatively few participants. Only seven vessels are engaged in the fishery on a full-time basis and only five of these vessels have been involved in the fishery for more than four years. The vessel owners and operators identified ten communities in which they live, including: Windsor Locks, CT; Fall River, Gloucester, Hamilton, New Bedford, and South Dartmouth, Massachusetts; Westport, Maine; Adamsville and Tiverton, Rhode Island; and Seattle, Washington. Red crab fishermen have lived in these communities for over 17 years, on average, and some fishermen report having lived in their communities for as long as 44 years. Six ports were identified as the primary ports of vessel operations and mooring: Fall River, Gloucester, and New Bedford, Massachusetts; Bristol, Maine; Portsmouth, Rhode Island; and Tiverton, Rhode Island.

In a survey completed by participants in the red crab fishery, the majority of fishermen did not consider their communities to be fishing communities. Only three vessel owners or operators consider their communities to be significantly dependent on fishing.

The type of service industries used by the red crab fishery include: fuel, ice, food and groceries, bait, gear, oil/lubrication, water, hull maintenance, engine maintenance, electronics, insurance, accounting, legal advice, and dockage. The fishery-related service industries in the New Bedford, Massachusetts, area provide more support to the red crab fishery than all other locations combined. Due to the small size of the fishery and the small number of fishing vessels involved, however, it is unlikely that providing these services to red crab vessels accounts for more than a very minor component of any service industry's overall fishery-related revenue.

The small size of the harvesting sector of this fishery is carried over to the processing sector, which is also relatively small. There are four wholesale and/or processing entities reportedly involved with the red crab fishery. These companies are based in New Bedford and Fall River, MA; Portland, ME; and Warren, RI.

Effects of Management Actions on Fishing Dependent Communities

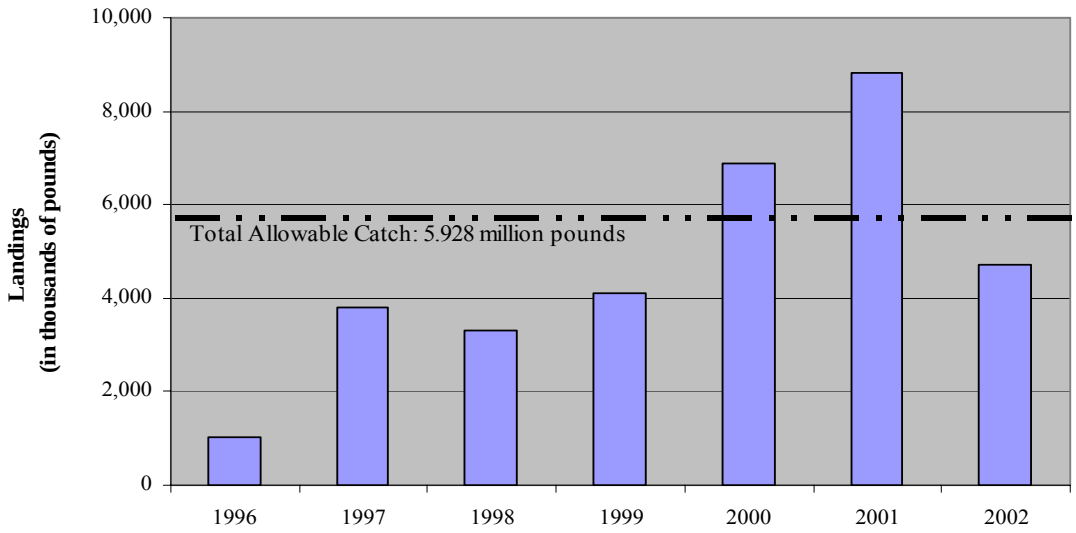
The most recent management action affecting the red crab fishery is the Red Crab FMP, which became effective on October 21, 2002. The FMP establishes a target total allowable catch (TAC) for the red crab fishery. The TAC is set through an annual specification process at a level equal to the most current estimate of Optimum Yield (OY) for the fishery. Along with the annual target TAC, the annual specification process involves calculation of the total DAS that may be utilized by the directed fishery, based on the average catch per DAS from the previous year. Total DAS are allocated equally to all vessels issued a limited access red crab permit.

The EIS for the FMP determined that a target TAC to manage the directed red crab fishery could result in adverse social impacts on current participants. First, the TAC may have to

be set significantly lower than current landings. This would in turn reduce revenues, with a potential reduction in occupational opportunities for some fishermen, and a general decrease in flexibility and stability associated with this fishery, in turn increasing the uncertainty felt by the participants. Currently, the TAC is set at 5.928 million pounds. Although this level is below total landings in 2000 and 2001, it is higher than total landings in all years prior to 2000. Furthermore, in 2002, the first full year the FMP was in effect, total landings for the red crab fishery did not exceed the 2002 TAC level (Exhibit 9-36).

Exhibit 9-36

HISTORICAL RED CRAB LANDINGS AGAINST THE CURRENT TAC LEVEL



Source: National Marine Fisheries Service, Fisheries Statistics and Economics Division, Silver Spring, MD.

Second, without other complementary controls, the simple establishment of an overall TAC for the fishery could create a derby-type fishery, where the participants fish much more intensively and more frequently than they would under other conditions, in an attempt to harvest as much crab as they can before the TAC is reached and the fishery is closed down. Depending on the number of participants in the fishery and the level of the TAC, this "race to fish" could result in significant decreases in flexibility and stability in the fishery, as well as significant increases in the uncertainty associated with the fishery and the availability of the resource. In order to reduce the potential for the creation of a derby-style fishery, the Red Crab FMP first calculates total DAS based on the TAC level and the average catch per DAS from the previous year, and allocates the total DAS equally to all vessels in the fishery.

9.4.5.9 Scup

Commercial scup landings have declined substantially since peaking in the 1960s. In 1989, commercial landings decreased to 8.2 million pounds, the lowest value recorded during the ten-year period from 1983 to 1992, and only about 17 percent of the 49 million pounds landed in 1960. Since 1996, commercial landings have decreased substantially to between three and five million pounds annually, a reflection of low stock abundance and Federal management of the fishery through annual harvest quotas beginning in 1997. The scup resource index improved following implementation of the harvest quotas, resulting in an increase in total allowable catch (from 9.1 million pounds in 1997 to 12.92 million pounds in 2002) and removal of the scup resource from the list of fisheries designated as overfished. In recent years, however, the scup resource index has declined. As of 2005, the scup resource was again considered overfished (ASMFC, 2005).

Fishing Communities

Scup are landed all along the Atlantic coast from Maine to Florida. However, the majority of the harvest is landed in Rhode Island, New Jersey, New York, and Massachusetts. Exhibit 9-37 shows ports ranked by landed value of scup and as a percentage of the value of port landings for all species. Three ports accounted for 65 percent of all scup landed value in 1992: Point Judith, RI; Montauk, NY; and Cape May, New Jersey.

Exhibit 9-37

MAJOR SCUP PORTS (1992)[1]

Port	Percent of Total Scup Landings	Scup Landed as a Percent of Total Port Landings
Point Judith, RI	26.16%	5.43%
Montauk, NY	23.18%	6.41%
Cape May, NJ	15.35%	3.31%
Freeport/Brooklyn, NY	5.74%	10.46%
Barnstable, MA	3.50%	0.80%
Other Wash., RI	3.46%	1.28%
Stonington, ME	2.18%	2.25%
Monmouth, NJ	2.30%	1.79%
Hampton Roads, NY	1.22%	0.28%
Point Pleasant, NJ	1.21%	0.56%
Ocean City, MD	0.24%	0.22%
New Bedford, MA	0.18%	0.01%
Barnegat Light, NJ	0.01%	0.01%

Notes:
[1] Newport, RI is an important component of both data sets presented above, but due to the confidentiality of data, it was not ranked.

Source: MAFMC, 1996a and 1996b.

Effects of Management Actions on Fishing Dependent Communities

The seven-year rebuilding schedule identified in the Scup FMP is expected to reduce exploitation of scup and restore the stock. The FMP also specifies minimum size requirements and commercial gear restrictions, including minimum mesh size, maximum roller diameter, and pot and trap degradable fastener and escape vent provisions. The FEIS for this rule indicated that gross revenues may be reduced by more than five percent for some small entity participants, or that operating costs may increase by more than five percent for some small entity participants who have to purchase new gear. It is unlikely, however, that more than 20 percent of affected small entities (otter trawl vessels) in this fishery would be required to make these purchases. Additionally, harvesters must replace codends and rollers as a routine cost of doing business, so not all costs can be attributed to the FMP gear requirements. As a result, NMFS concluded that this rule would not impact a substantial number of small entities (61 FR 43420).

The FEIS presents data demonstrating that the participants in the scup fishery rely on a number of other species as well, including squid, summer flounder, Atlantic mackerel, and silver hake. When compared to the other species, scup is a relatively low-value species for participants in this mixed species fishery. In addition, scup landings in the states of Rhode Island, New Jersey and New York represented only 2.0 percent, 2.3 percent, and 2.1 percent, respectively, of the total commercial value of all other species landed (61 FR 43420).

9.4.5.10 Summary of Factors Affecting Fishing Dependent Communities

Exhibit 9-38 summarizes the number of active or permitted vessels, the past, present, and reasonably foreseeable future actions, and the overall effect of those actions on the major fishing dependent communities affected by the ALWTRP regulatory alternatives.

Exhibit 9-38

SUMMARY OF FACTORS AFFECTING FISHING DEPENDENT COMMUNITIES

Fishery	Number of Active/ Permitted Vessels[1]	Major Past, Present, and Reasonably Foreseeable Future (PPRFFA) Actions	Effect of PPRFFAs
American Lobster	3,686 active	• Amendment 3 • Addenda I through VIII trap reductions • Potential restrictions under sea turtle strategy	Slightly Negative
Northeast Multispecies	2,153 permitted	• See 9.4.3.2 for history of management actions • Amendment 13 (May 2004) • Emergency Interim Final Rule (May 1, 2006) • Framework 24 (under development 2006)	Highly Negative
Monkfish	647 permitted	• Monkfish FMP DAS reductions	Negative
Spiny Dogfish	815 permitted	• Spiny Dogfish FMP DAS reductions	Negative
Shark	Not available	• Amendment 1 harvest quotas	Negative
Coastal Migratory Pelagic	Not available	• See 9.4.3.6 for history of management actions • Amendment 12 harvest quotas	Negative
Northern Black Sea Bass	105 active	• Amendment 9 harvest quotas • Amendment 13 harvest quotas • HPTRP area restrictions • Potential restrictions under sea turtle strategy	Slightly Negative
Southern Black Sea Bass	46 active	• Amendment 9 increases in minimum size; gear modifications • Amendment 13C measures to reduce southern black sea bass fishing effort • Potential restrictions under sea turtle strategy	Slightly Negative
Hagfish	7 active	• Hagfish FMP in development.	Not applicable
Red Crab	3 active	• Red Crab FMP harvest quota	Slightly Negative
Scup	27 active	• Amendment 8 harvest quota • Restrictions for the Atlantic scup gillnet fishery under HPTRP • Potential restrictions under sea turtle strategy	Slightly Negative
Jonah Crab	Not available	• Not a federally managed fishery at this time.	Not applicable
Conch/Whelk	54 active	• Not a federally managed fishery at this time.	Not applicable

Notes:

[1] The number of vessels reported here reflects the number of active vessels or, when this information is unavailable, the number of federally permitted vessels. The number of permitted vessels reported includes only those that identify gear that is currently or potentially subject to the requirements of the ALWTRP as their primary gear (2002). Fisheries marked N.A. include those for which data on the number of active or permitted vessels are not available (Jonah crab) and those for which information on gear use is not available (shark and coastal migratory pelagic species).

9.5 CONSEQUENCES OF THE ALTERNATIVES CONSIDERED

The following sections summarize the direct and indirect impacts on each VEC of the regulatory alternatives evaluated in this DEIS.

9.5.1 Atlantic Large Whales

A complete analysis of the direct and indirect impacts of the regulatory alternatives considered can be found in Chapter 5.

9.5.2 Other Protected Species

A complete analysis of the direct and indirect impacts of the regulatory alternatives considered can be found in Chapter 5.

9.5.3 Affected Fisheries

A complete analysis of the direct and indirect impacts of the regulatory alternatives considered can be found in Chapter 6.

9.5.4 Habitat

A complete analysis of the direct and indirect impacts of the regulatory alternatives considered can be found in Chapter 5.

9.5.5 Fishing Dependent Communities

A complete analysis of the direct and indirect impacts of the regulatory alternatives considered can be found in Chapter 7.

9.6 CUMULATIVE EFFECTS OF THE ALTERNATIVES CONSIDERED

The following tables (Exhibits 9-39 through 9-43) summarize the cumulative effects of each alternative considered in this FEIS on each VEC in relation to the past, present, and reasonably foreseeable future actions. Cumulative impacts are assessed using the following terms:

- "Positive effect" means that the cumulative effects of an alternative are expected to improve the status of the resource relative to its current status under past, present, and reasonably foreseeable future actions.

- "Negative effect" means that the cumulative effects of an alternative are expected to adversely affect the status of the resource relative to its current status under past, present, and reasonably foreseeable future actions.

- "Neutral effect" means that the cumulative effects of an alternative are expected to be no different than they had been under past, present, and reasonably foreseeable future actions.

- "None identified" means that no cumulative effect is foreseen, but one might exist in the future.

The exhibits suggest the following cumulative impacts:

- **Large Whales**: Past and present actions (e.g., whaling bans) have slowed the rapid decline of key whale species. The ALWTRP modifications considered here would reduce the risk of serious injury or mortality due to entanglement without exacerbating the risk associated with any of the remaining stressors. Therefore, all regulatory alternatives, excluding the no action alternative, are expected to have an overall positive cumulative effect on large whale survival. Exhibit 9-39 presents a more detailed analysis by alternative.

- **Other Protected Species**: The ALWTRP modifications considered here would complement existing and forthcoming actions to reduce takes of other protected species. Hence, the cumulative effect of all regulatory alternatives, excluding the no action alternative, is expected to be slightly positive to positive. Exhibit 9-40 presents a more detailed analysis by alternative.

- **Habitat**: The ALWTRP modifications considered here are likely to have no significant, long-term impact on habitat. However, the potential action could contribute to increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, and could result in adverse impacts on habitat in exempted areas where fishing pressure may intensify. Therefore, the cumulative effects of Alternatives 2, 3*, 4, 5, 6 Draft*, and 6 Final (Preferred) are expected to be slightly negative. Exhibit 9-41 presents a more detailed analysis by alternative.

- **Affected Fisheries**: The potential modifications to the ALWTRP are likely to have no significant, long-term impact on affected fishery resources (e.g., the American lobster resource, groundfish resources, etc.). Therefore, no cumulative effects are identified for any of the regulatory alternatives (Exhibit 9-42).

Fishing Dependent Communities: The cumulative impacts for fishing dependent communities are a function of current and forthcoming management actions, as well as the incremental impacts of modifications to the ALWTRP. While the regulatory changes specified under Alternative 5 would be unlikely to have significant economic or social impacts, the regulatory changes specified under Alternatives 2, 3*, 4, 6 Draft*, and 6 Final (Preferred) would likely have more significant effects. The greatest socioeconomic pressure would likely be felt by those in the lobster trap/pot fishery, particularly those who operate small lobster vessels; compliance costs for these fishermen are likely to represent a greater share of total revenues than would be the case for most others. This is especially true for Alternatives 2, 3*, 4, and 6 Draft*, which would exempt a smaller percentage of Maine state waters from ALWTRP requirements and thus would likely affect a greater number of vessels. The economic burden associated with these alternatives would be felt by small-boat lobstermen and their families in numerous communities, particularly in Maine, and could force some individuals to leave the industry. Cumulative effects under Alternative 6 Final (Preferred) would be less acute, in large part because this alternative would exempt a greater share of Maine state waters from ALWTRP requirements. Some vessels might still be forced to leave the industry under this alternative, but at the community level, broad-scale socioeconomic dislocation is unlikely; the most acutely affected segments of the lobster trap/pot fishery account for a relatively small share of total employment in the commercial fishing industry, and the effects on employment, if any, are not likely to be concentrated in any one port. Exhibit 9-43 presents a more detailed analysis by alternative for the lobster trap/pot fishery, the other trap/pot fishery, and the gillnet fishery.

Exhibit 9-39

VALUED ECOSYSTEM COMPONENT: ATLANTIC LARGE WHALES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.1	• **ALWTRP Rule**: The ALWTRP implemented gear modifications for the lobster trap/pot and gillnet fisheries to reduce incidental entanglement of Atlantic large whales in fishing gear. The initial rule went into effect in 1997; since then it has been updated in February 1999, December 2000, January 2002, and January 2003. This rule has resulted in positive effects from the implementation of low-risk gear modifications and seasonal closures where there is significant interaction between whales and lobster trap/pot and gillnet activity. • **Fishery Management Actions**: Positive effects have also resulted from the implementation of various management actions for fisheries that interact with Atlantic large whales. Reductions in entanglement risk have indirectly resulted from measures such as effort reductions; closures; and days-at-sea and trip limitations. • **Other Actions**: Whaling bans, water quality regulations.	• **Fishery Management Actions**: Same as past and present actions. • **Other Potential Actions**: Management efforts to reduce incidental takes of right whales from ship strikes.	**Negative cumulative effect.** Alternative 1 would not modify the ALWTRP to reduce the risk of entanglement to large whales. This would likely result in additional losses of individuals from endangered populations.
Alternative 2	See section 5.1			**Positive cumulative effects.** Alternative 2 would implement broad-based gear modification requirements on a year-round basis in all areas subject to the ALWTRP. These requirements are designed to reduce whale entanglement risks. Based on current understanding of the seasonal distribution of whale stocks, the year-round approach might achieve little incremental risk reduction relative to the seasonal approach embodied in other alternatives, and thus would be highly risk averse.
Alternative 3*	See section 5.1			**Positive cumulative effects.** Alternative 3* would implement broad-based gear modification requirements on a year-round basis in the Northeast and on a seasonal basis in the Southeast and Mid-Atlantic, based on current understanding of the seasonal distribution of whale stocks. This alternative would reduce entanglement risks, but is not as risk averse as Alternative 2. Available data on whale sightings suggest that the practical benefits of this approach may be as great as those that would be achieved under coast-wide year-round standards.
Alternative 4	See section 5.1			**Positive cumulative effects.** Alternative 4 would implement broad-based gear modification requirements on a year-round basis in the Northeast and Mid-Atlantic, and on a seasonal basis in the Southeast. Based on current understanding of the seasonal distribution of whale stocks, this approach would be more conservative than Alternative 3, but not as risk averse as Alternative 2.
Alternative 5	See section 5.1			**Positive cumulative effects.** Alternative 5 focuses on expanding the provisions of the existing SAM program and thus differs significantly from the other alternatives. Boundaries for the SAM zone would be revised, and all vessels fishing in SAM waters would be required to use non-floating line in all groundline and in the upper two-thirds of all buoy lines. These requirements and the SAM program would continue indefinitely. This alternative, however, would not expand broad-based gear modification requirements outside the SAM zone. As a result, the benefits of Alternative 5 for Atlantic large whales would likely be significantly lower than the benefits derived from other alternatives.
Alternative 6 Draft*	See section 5.1			**Positive cumulative effects.** Alternative 6 Draft* blends the broad-based seasonal gear modification requirements specified under Alternative 3 with the expanded SAM program specified under Alternative 5. The implementation of broad-based seasonal gear modification requirements would reduce entanglement risks in Atlantic waters when the potential for interactions between ALWTRP-regulated fisheries and Atlantic large whales is greatest. The expanded SAM program would provide additional protection between the effective date of the plan and 12 months after the rule's publication, when the broad-based gear modification requirements would take effect.
Alternative 6 Final (Preferred)	See section 5.1			**Positive cumulative effects.** Alternative 6 Final (Preferred) offers the advantages of Alternative 6 Draft*. Expansion in the percentage of Maine state waters exempt from ALWTRP requirements may reduce benefits relative to Alternative 6 Draft*.

Key:
* = Specified as a Preferred Alternative in the DEIS

Exhibit 9-40

VALUED ECOSYSTEM COMPONENT: OTHER PROTECTED SPECIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.2.1	• **AOCTRT**: Positive effects from the reduction of entanglement risks implemented through the HMS FMP. • **ALWTRP Rules**: The ALWTRP has implemented gear modifications for the lobster trap/pot and gillnet fisheries to reduce incidental entanglement of specific Atlantic large whales in fishing gear; this rule also provides the same benefits to other large whale species whose ranges overlap the ALWTRP area. • **HPTRP**: Positive effects from the implementation of area restrictions on gillnet activity from the Gulf of Maine to the Mid-Atlantic region. • **Turtle Excluder Devices**: Positive effects from the reduction of entanglement risk from shrimp trawling operations. • **VA Pound Net Rule**: This rule enacted seasonal area and gear restrictions designed to reduce the entanglement of sea turtles in the state fishery. • **Fishery Management Actions**: Positive effects have also resulted from the implementation of various management actions for fisheries that interact with protected species. Reductions in entanglement risk have indirectly resulted from measures such as time/area closures and effort reductions (e.g., days-at-sea allocations, trip limits), and from recent hook, bait, and sea turtle release gear requirements for pelagic longline fisheries. • **BDTRP**: Positive effects from the gillnet effort reduction, gear proximity requirements, and gear or gear deployment modifications in the Mid- and South Atlantic regions.	• **Atlantic Trawl and Longline Take Reduction Teams**: These new take reduction teams will address the incidental take of marine mammals and other protected species in these fisheries. • **Sea Turtle Strategy**: Released by NMFS in June 2001, the plan will address the incidental capture of endangered or threatened sea turtle species in state and Federal fisheries in the Atlantic and Gulf of Mexico. • **Fishery Management Actions**: Same as past and present actions.	**Neutral cumulative effect.**
Alternative 2	See section 5.2.1			**Positive cumulative effects.** Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round in all ALWTRP areas under Alternative 2, with ancillary reductions in entanglement risks for sea turtles, harbor porpoises, and bottlenose dolphins.
Alternative 3*	See section 5.2.1			**Positive cumulative effects.** Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of 40 degrees N latitude, and on a seasonal basis elsewhere; as a result, this alternative would likely provide fewer ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic and Southeast waters than would Alternatives 2 or 4.
Alternative 4	See section 5.2.1			**Positive cumulative effects.** Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of the SC/GA border, and on a seasonal basis in the Southeast. Although this alternative would provide greater ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic waters than would Alternatives 1 (No Action), 3*, 5, 6 Draft*, and 6 Final (Preferred), it would provide less protection in the Southeast than would Alternative 2.
Alternative 5	See section 5.2.1			**Slightly positive cumulative effects.** Extension of SAM groundline and buoy line requirements to additional fisheries and expansion of the SAM program to new areas could help reduce entanglement risks for sea turtles and harbor porpoises in Northeast waters. Alternative 5, however, would not impose broad-based groundline, buoy line, and net anchoring requirements in other areas; as a result, the ancillary benefits associated with these requirements, either on a seasonal or year-round basis, would not be realized.
Alternative 6 Draft*	See section 5.2.1			**Positive cumulative effects.** Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of 40 degrees N latitude, and on a seasonal basis elsewhere; as a result, this alternative would likely provide fewer ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic and Southeast waters than would Alternatives 2 or 4. Expansion of the SAM area and extension of the SAM program to additional fisheries until implementation of broad-based gear modification requirements 12 months after the rule's publication could provide ancillary benefits to other protected species in Northeast waters.
Alternative 6 Final (Preferred)	See section 5.2.1			**Positive cumulative effects.** Broad-based groundline, buoy line, and net anchoring requirements would be implemented year-round north of 40 degrees N latitude, and on a seasonal basis elsewhere; as a result, this alternative would likely provide fewer ancillary benefits to sea turtles and bottlenose dolphins in Mid-Atlantic and Southeast waters than would Alternatives 2 or 4. Expansion of state waters exempt from ALWTRP requirements may reduce benefits to other protected species relative to Alternative 6 Draft*. Expansion of the SAM area and extension of the SAM program to additional fisheries until implementation of broad-based gear modification requirements 12 months after the rule's publication could provide ancillary benefits to other protected species in Northeast waters.

Key:
* = Specified as a Preferred Alternative in the DEIS

Exhibit 9-41

VALUED ECOSYSTEM COMPONENT: HABITAT

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Alternative 1 (No Action)	See section 5.2.2	• **External Management Actions**: – Clean Water Act; – CZMA of 1972; – MPRSA of 1972; – OPA of 1990; and – International laws regarding marine pollution. • **Internal Management Actions**: Determinations or regulations that have been enacted by NMFS or the Councils that clearly benefit EFH, such as essential fish habitat designations; area closures; gear and crew restrictions/alterations; permitting restrictions; and effort reductions (e.g., days-at-sea allocations, trip limits).	• **EFH Review**: The NEFMC and the SAFMC will be reviewing and revising the EFH component of all FMPs under their authority in the near future. • **Internal Management Actions**: Same as past and present actions.	**Neutral cumulative effect**.
Alternative 2	See section 5.2.2			**Slightly negative cumulative effects.** Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 2 would result in installation of the greatest amount of non-floating groundline; therefore, in comparison with other alternatives, this alternative would be expected to have the greatest adverse impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 3*	See section 5.2.2			**Slightly negative cumulative effects.** Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 3* would result in the installation of slightly less non-floating groundline than would Alternatives 2 and 4; therefore, in comparison to these alternatives, Alternative 3* would be expected to have slightly lower impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 4	See section 5.2.2			**Slightly negative cumulative effects.** Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 4 would result in installation of the same amount of non-floating groundline as would Alternative 2. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 5	See section 5.2.2			**Slightly negative cumulative effects.** Alternative 5 would not impose a broad-based requirement for the use of non-floating groundline; therefore, in comparison to Alternatives 2, 3*, 4, 6 Draft*, and 6 Final (Preferred), this alternative is expected to have less impact on benthic habitat. Negative effects are anticipated, however, as a result of extension of SAM anchoring and groundline requirements to additional areas. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 6 Draft*	See section 5.2.2			**Slightly negative cumulative effects.** Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 6 Draft* would result in the installation of a slightly smaller amount of non-floating groundline than would Alternatives 2 and 4; therefore in comparison to these alternatives, Alternative 6 Draft* would be expected to have a slightly lower impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.
Alternative 6 Final (Preferred)	See section 5.2.2			**Slightly negative cumulative effects.** Negative effects are anticipated as a result of increased contact between fishing gear (i.e., groundline and anchors) and the ocean floor, but these effects are expected to be minimal. Alternative 6 Final (Preferred) would result in the installation of a smaller amount of non-floating groundline than would Alternatives 2, 4, and 6 Draft*; therefore, in comparison to these alternatives, Alternative 6 Final (Preferred) would be expected to have less of an impact on habitat. In addition, a potential increase in fishing pressure in exempted areas could have an adverse impact on the benthic environment there. This alternative would have no impact on the continuing negative effect of other fishing and non-fishing activities.

Key:
* = Specified as a Preferred Alternative in the DEIS

Exhibit 9-42

VALUED ECOSYSTEM COMPONENT: FISHERY RESOURCES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Lobster Trap/Pot Fishery				
Alternative 1 (No Action)	See section 5.2.3	• **Fishery Management Actions:** Significant recent actions include Amendment 3, trap reductions for all LMAs under Addendum I, effort reductions in LMA 2 under Addendum IV, and a trap cap in LMA 3 under Addendum V. These actions are designed to improve fishery resource stocks. • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP.	• **Sea Turtle Strategy**: Lobster trap/pot fishery could be subject to regulations under this plan. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA.	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3*	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 Draft*	See section 5.2.3			None identified
Alternative 6 Final (Preferred)	See section 5.2.3			None identified
Gillnet Fisheries				
Alternative 1 (No Action)	See section 5.2.3	• **Fishery Management Actions**: Measures implemented under FMPs, including DAS reductions for the Northeast multispecies, monkfish, and spiny dogfish fisheries, and harvest quotas for the shark and coastal migratory pelagic species fisheries. These actions are designed to improve fishery resource stocks. • **HPTRP**: Area restrictions under the HPTRP apply to the following fisheries: Northeast multispecies, monkfish, and spiny dogfish. • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP, including the Northeast anchored float gillnet and the Northeast driftnet fisheries. • **BDTRP**: Fisheries subject to regulations under this plan include Mid-Atlantic, Southeast Atlantic and Southeastern U.S. Atlantic shark gillnet fisheries.	• **Sea Turtle Strategy**: Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA.	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3*	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 Draft*	See section 5.2.3			None identified
Alternative 6 Final (Preferred)	See section 5.2.3			None identified
Other Trap/Pot Fisheries				
Alternative 1 (No Action)	See section 5.2.3	• **Fishery Management Actions**: Measures implemented under FMPs, including harvest quotas for black sea bass, scup, and red crab. These actions are designed to improve fishery resource stocks. • **HPTRP**: Area restrictions under the HPTRP for the northern black sea bass fishery. • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP for the red crab fishery.	• **Sea Turtle Strategy**: Fisheries that could be subject to regulations under this plan include black sea bass. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA. • **FMPs**: An increase in fishing pressure on the following fisheries, not currently regulated under the SFA, could result in Federal regulation: hagfish, Jonah crab, and conch/whelk.	Neutral cumulative effect
Alternative 2	See section 5.2.3			None identified
Alternative 3*	See section 5.2.3			None identified
Alternative 4	See section 5.2.3			None identified
Alternative 5	See section 5.2.3			None identified
Alternative 6 Draft*	See section 5.2.3			None identified
Alternative 6 Final (Preferred)	See section 5.2.3			None identified

Key:
* = Specified as a Preferred Alternative in the DEIS

Exhibit 9-43

VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Lobster Trap/Pot Fishery				
Alternative 1 (No Action)	No change.	• **Fishery Management Actions**: Significant recent actions include Amendment 3, trap reductions for all LMAs under Addendum I, effort reductions in LMA 2 under Addendum IV, and a trap cap in LMA 3 under Addendum V. These actions are designed to improve fishery resource stocks and have resulted in slightly negative economic and social impacts on regulated lobster fishermen and communities. Independent vessels in LMA 2 and 6 may be particularly vulnerable to increased regulatory costs as a result of the mass mortality of lobster in LIS (1999). • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP. Resulted in slightly negative economic and social impacts on vessels fishing in Restricted Areas (especially Cape Cod Bay from January 1 – May 15) and SAM areas. • **Buyback Programs**: Existing and upcoming groundline buyback programs will reduce ALWTRP impacts on vessel owners and fishing communities.	• **Sea Turtle Strategy**: Lobster trap/pot fishery could be subject to regulations under this plan. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA.	**Neutral cumulative effect.**
Alternative 2 Alternative 3* Alternative 4	Heavily affected vessels include: • Class II vessels in Maine state waters • Class I vessels in Offshore, Southern Nearshore, and Maine state waters; and • Class I, II and III vessels in LMA 6.			**Negative cumulative effects** for many vessels under Alternatives 2, 3*, and 4, particularly Class II vessels. There is little difference in economic and social impacts among these alternatives because all three impose year-round gear modification requirements north of 40 degrees N latitude, where the lobster trap/pot fishery is concentrated.
Alternative 5	Heavily affected vessels include Class II vessels newly regulated in Offshore SAM waters.			**Neutral to slightly negative cumulative effects.** The economic and social impacts of Alternative 5 are a fraction of the impacts estimated for Alternatives 2, 3*, 4, 6 Draft*, and 6 Final (Preferred). The estimate of heavily-affected vessels is limited to one Class II vessel operating in Offshore waters that would become newly regulated under the SAM program.
Alternative 6 Draft*	Heavily affected vessels under Alternative 6 Draft* are the same as under Alternatives 2, 3*, and 4.			**Negative cumulative effects.** The estimated economic and social impacts of Alternative 6 Draft* are slightly less but essentially equal to those estimated under Alternatives 2, 3*, and 4.
Alternative 6 Final (Preferred)	Many fewer heavily affected vessels relative to Alternative 6 Draft* as a result of the expansion of Maine state waters that would be exempt from ALWTRP requirements			**Negative cumulative effects.** The estimated economic and social impacts of Alternative 6 Final (Preferred) are lower than those estimated under Alternative 6 Draft* because Alternative 6 Final (Preferred) is anticipated to affect fewer vessels and to impose slightly lower costs on those it would affect; however, the costs imposed on some vessels, particularly smaller vessels, could represent a significant burden relative to annual revenues.

Exhibit 9-43

VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Gillnet Fisheries				
Alternative 1 (No Action)	No change.	• **Fishery Management Actions**: Measures implemented under FMPs, including DAS reductions for the Northeast multispecies, monkfish, and spiny dogfish fisheries, and harvest quotas for the shark and coastal migratory pelagic species fisheries. These actions are designed to improve fishery resource stocks. • **HPTRP**: Area restrictions under the HPTRP apply to the following fisheries: Northeast multispecies, monkfish, and spiny dogfish. • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP, including the Northeast anchored float gillnet and the Northeast driftnet fisheries. • **BDTRP**: Fisheries subject to regulations under this plan include Mid-Atlantic, Southeast Atlantic and Southeastern U.S. Atlantic shark gillnet fisheries.	• **Sea Turtle Strategy**: Fisheries that could be subject to regulations under this plan include Northeast multispecies, monkfish, and spiny dogfish. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA.	**Neutral cumulative effect.**
Alternative 2	No heavily affected vessels identified.			**Slightly negative cumulative effects.** The social impact assessment identified 21 at-risk vessels under all three alternatives (i.e., annual compliance costs represent 5 to 15 percent of annual revenues). Most of these vessels are in the Mid-Atlantic anchored gillnet fishery. No other vessels are expected to incur compliance costs greater than five percent of estimated revenues. However, all of the gillnet fisheries are subject to numerous regulations that adversely affect the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative.
Alternative 3*				
Alternative 4				
Alternative 5	No heavily affected vessels identified.			**Neutral to slightly negative cumulative effects.** The social impact assessment for Alternative 5 found no gillnet vessels at risk. However, all of the gillnet fisheries are subject to numerous regulations that have resulted in highly adverse impacts for the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative for some portions of the gillnet fishery and neutral in others.
Alternative 6 Draft*	No heavily affected vessels identified.			**Slightly negative cumulative effects.** The social impact assessment identified 21 at-risk vessels. Most of these vessels are in the Mid-Atlantic anchored gillnet fishery. No other vessels are expected to incur compliance costs greater than five percent of estimated revenues. However, all of the gillnet fisheries are subject to numerous regulations that have resulted in highly adverse impacts for the Northeast multispecies fishery, as well as adverse impacts for the monkfish, spiny dogfish, shark, and coastal migratory pelagic species fisheries. Therefore, the cumulative effects are expected to be slightly negative.
Alternative 6 Final (Preferred)	No heavily affected vessels identified.			**Slightly negative cumulative effects.** Impacts comparable to those estimated for Alternative 6 Draft*.

Exhibit 9-43

VALUED ECOSYSTEM COMPONENT: FISHING DEPENDENT COMMUNITIES

Alternative	Direct and Indirect Impacts	Past and Present Actions, Including Other Federal and Non-Federal Actions	Reasonably Foreseeable Future Actions (RFFAs), Including Other Federal and Non-Federal Actions	Cumulative Effects Associated with ALWTRP Modifications
Other Trap/Pot Fisheries				
Alternative 1 (No Action)	No change.	• **Fishery Management Actions**: Measures implemented under FMPs, including harvest quotas for black sea bass, scup, and red crab. These actions are designed to improve fishery resource stocks and have resulted in slightly negative economic and social impacts on regulated fishermen and communities. • **HPTRP**: Area restrictions under the HPTRP for the northern black sea bass fishery. • **ALWTRP**: Gear restrictions and area closures under the current ALWTRP for the red crab fishery.	• **Sea Turtle Strategy:** Fisheries that could be subject to regulations under this plan include black sea bass. • **Fishery Management Actions**: Additional fishery management measures may be necessary to ensure that fishery resources are not designated as "overfished" and "overfishing" is not occurring under the SFA. • **FMPs**: An increase in fishing pressure on the following fisheries, not currently regulated under SFA, could result in Federal regulation: hagfish, Jonah crab, and conch/whelk.	**Neutral cumulative effect**.
Alternative 2	Heavily affected vessels include: • Black sea bass Class I and II vessels in Southern and Mid-Atlantic Nearshore waters; and • Hagfish Class II vessels in Northern Nearshore waters.			**Slightly negative cumulative effects** for most fisheries under Alternatives 2, 3*, and 4. **Negative cumulative effects** for the black sea bass and hagfish fisheries. For black sea bass, this action, which has been determined to heavily affect Class I and II black sea bass vessels, is in addition to harvest quotas already implemented; for hagfish, this represents the first significant Federal regulation. As a result, negative cumulative effects are expected for both fisheries.
Alternative 3*				
Alternative 4				
Alternative 5	Estimates of annual compliance costs do not exceed 3.5 percent of estimated annual revenues for any class of vessel.			**Slightly negative cumulative effects** for most fisheries.
Alternative 6 Draft*	Heavily-affected vessels include black sea bass Class I and II vessels in Southern and Mid-Atlantic Nearshore waters.			**Slightly negative cumulative effects** for most fisheries. **Negative cumulative effects** for the black sea bass and hagfish fisheries. For black sea bass, this action, which has been determined to heavily affect Class I and II black sea bass vessels, is in addition to harvest quotas already implemented; for hagfish, this represents the first piece of significant Federal regulation. As a result, negative cumulative effects are expected for both fisheries.
Alternative 6 Final (Preferred)	Heavily-affected vessels include black sea bass Class I vessels in Southern and Mid-Atlantic Nearshore waters.			**Slightly negative cumulative effects** for most fisheries. **Negative cumulative effects** for the black sea bass fishery. This action is in addition to harvest quotas already implemented. As a result, negative cumulative effects are expected.

Key:
* = Specified as a Preferred Alternative in the DEIS

Exhibit 9-44 provides a more concise summary of the cumulative effects of each alternative on the five VECs: Atlantic large whales, other protected species, habitat, fishery resources, and fishing dependent communities. Cumulative effects are assessed using the same terms described above: positive effect, negative effect, neutral effect, and none identified.

The exhibit suggests the following cumulative effects expected across all VECs for each alternative under consideration:

- **Alternative 1 (No Action):** The No Action alternative is not expected to affect four out of the five VECs being considered here, as this alternative would not alter the current state of the ALWTRP. However, negative effects would be expected on large whales in light of the continued risk of entanglements.

- **Alternative 2:** Large whales and other protected species are expected to benefit, as this alternative would implement broad-based gear modification requirements year-round. Habitat may experience a slight (but minimal) negative effect due to the increased contact of gear with the seafloor, as well as the potential for increased amounts of fishing in exempted waters. No potential effects have been identified on fishery resources. Fishing dependent communities are expected to experience negative to slightly negative effects.

- **Alternative 3*:** The potential cumulative effects of this preferred alternative would be similar to those associated with Alternative 2. The implementation of this alternative is expected to benefit large whales by requiring broad-based gear modifications on a seasonal basis based on the distribution of whale stocks. Other protected species are expected to experience ancillary benefits, as well. There may be slightly negative (but minimal) effects on habitat due to the increased contact of gear with the seafloor, as well as the potential for increased amounts of fishing in exempted waters. No potential effects are expected on fishery resources, and negative to slightly negative effects are expected on fishing dependent communities.

- **Alternative 4:** The effects of implementing Alternative 4 would be similar to those associated with Alternatives 2 and 3*. Alternative 4 would implement broad-based gear modification requirements year-round in both the Northeast and Mid-Atlantic and on a seasonal basis in the Southeast; thus, Alternative 4 would provide slightly greater benefits to large whales than Alternative 3* and slightly less than Alternative 2.

- **Alternative 5:** The implementation of this alternative would benefit large whales by expanding the provisions of the SAM program; however, the benefits would be significantly less than those of the other alternatives (excluding the No Action Alternative) because broad-based gear modifications would not be expanded outside of the SAM zone. Other protected species may experience slightly positive benefits due to the expanded SAM zone. The extension of SAM anchoring and groundline requirements to additional areas under Alternative 5 would likely have less of an impact on benthic habitat than would the implementation of broad-based gear modification requirements under Alternatives 2, 3*, 4, 6 Draft* and 6 Final (Preferred); these effects would still be slightly negative (but minimal). Again, no effects have been identified on fishery resources. Fishing dependent communities

are expected to experience neutral to slightly negative effects, as this alternative does not incorporate broad-based gear modification requirements.

- **Alternative 6 Draft*:** The effects of implementing Alternative 6 Draft* would be similar to those associated with Alternatives 2, 3*, and 4. Alternative 6 Draft* would benefit large whales by blending broad-based gear modification requirements with an expanded SAM program. Other protected species may receive ancillary benefits from these measures. Habitat would experience slightly negative (but minimal) effects resulting from an increase in gear contacting the seafloor, as well as the potential for increased amounts of fishing in exempted waters. No effects have been identified for fishery resources, and fishing dependent communities are expected to incur negative to slightly negative effects.

- **Alternative 6 Final (Preferred):** The effects of implementing Alternative 6 Final (Preferred) would be similar to those reviewed for Alternative 6 Draft*. Key differences would include the following: (1) Alternative 6 Final (Preferred) would offer slightly lower risk-reduction benefits for whales and other affected species as a result of the expansion of state waters that would be exempt from ALWTRP requirements; (2) negative impacts on EFH would be slightly reduced under 6 Final (Preferred) as a result of the expansion of exempt areas; and (3) negative impacts on fishing communities would be reduced under 6 Final (Preferred) because the regulations would affect a smaller number of vessels and thus, impose lower overall compliance costs.

Exhibit 9-44

SUMMARY OF CUMULATIVE EFFECTS ACROSS ALL VECs FOR EACH ALTERNATIVE

Alternative	Atlantic Large Whales	Other Protected Species	Habitat	Fishery Resources	Fishing Dependent Communities
Alternative 1 (No Action)	Negative effects	Neutral effects	Neutral effects	**Lobster Trap/Pot Fishery:** Neutral effects **Gillnet Fisheries:** Neutral effects **Other Trap/Pot Fisheries:** Neutral effects	**Lobster Trap/Pot Fishery:** Neutral effects **Gillnet Fisheries:** Neutral effects **Other Trap/Pot Fisheries:** Neutral effects
Alternative 2	Positive effects	Positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Negative effects **Gillnet Fisheries:** Slightly negative effects **Other Trap/Pot Fisheries:** Negative to slightly negative effects
Alternative 3*	Positive effects	Positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Negative effects **Gillnet Fisheries:** Slightly negative effects **Other Trap/Pot Fisheries:** Negative to slightly negative effects
Alternative 4	Positive effects	Positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Negative effects **Gillnet Fisheries:** Slightly negative effects **Other Trap/Pot Fisheries:** Negative to slightly negative effects
Alternative 5	Positive effects	Slightly positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Neutral to slightly negative effects **Gillnet Fisheries:** Neutral to slightly negative effects **Other Trap/Pot Fisheries:** Slightly negative effects
Alternative 6 Draft*	Positive effects	Positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Negative effects **Gillnet Fisheries:** Slightly negative effects **Other Trap/Pot Fisheries:** Negative to slightly negative effects
Alternative 6 Final (Preferred)	Positive effects	Positive effects	Slightly negative effects	**Lobster Trap/Pot Fishery:** No effects identified **Gillnet Fisheries:** No effects identified **Other Trap/Pot Fisheries:** No effects identified	**Lobster Trap/Pot Fishery:** Negative effects **Gillnet Fisheries:** Slightly negative effects **Other Trap/Pot Fisheries:** Negative to slightly negative effects

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Appendix 9-A

SUPPLEMENTARY INFORMATION FOR CUMULATIVE EFFECTS ANALYSIS

Exhibit 9A-1

SUMMARY OF COLLISIONS BETWEEN SHIPS AND WHALES: RIGHT WHALES, 1972 THROUGH 2001

Date	Sex	Age	Outcome[1]	Location	Notes
January 1972		Calf	Mortality	Freeport, TX	severed tail
Winter 1972			Mortality	97 km E of Boston, MA	suspected right whale
April 1976	male	Calf	Mortality	Cape Cod, MA	large bruise
November 1976			Mortality	Portland, ME	large propeller cuts on back; possible ship collision
March 1979	male	Juvenile	Mortality	Long Island, NY	severed tail
May 1980	male		Non-fatal	Great South Channel, MA	deep cut along back, crossing spine
August 1980	male		Non-fatal	Bay of Fundy	series of 8 propeller cuts running along left flank and over back
February 1983	male	2 yrs.	Mortality	Island Beach, NJ	severed tail
August 1984			Non-fatal	Browns Bank	series of 5 propeller cuts
August 1986	female	1 yr.	Mortality	Massachusetts Bay	2 propeller cuts; severed spine
August 1986	female	5-7 yrs.	Presumed Dead	Bay of Fundy	
February 1987	female	Calf	Non-fatal	Southeast USA	series of five propeller cuts
July 1987	male	Juvenile	Mortality	Nova Scotia, Seaforth	several gashes in back
August 1987			Non-fatal	Browns Bank	fluke tip severed by propeller
February 1991	female	Calf	Non-fatal	Southeast USA	series of 3 propeller cuts
March 1991	female	2 yrs.	Mortality	Fernandina Beach, FL	fractured skull
July 1991		Calf	Mortality	East of Delaware Bay, DE	Coast Guard cutter (84 m) at 22 kn.
September 1992	female	Adult	Mortality	Bay of Fundy, Grand Manan Island	internal hemorrhaging
January 1993	male	Calf	Mortality	St. Augustine, FL	Coast Guard cutter (25 m) at 15 kn.; series of propeller slashes from dorsal peduncle to head, and lower left flank to throat
December 1993	female		Mortality	Offshore, VA	propeller gash on right side; probably ship strike
December 1993	male	12-22 m	Mortality	NC/VA border	scar on leading edge of fluke and right side mid-body
February 1994		Calf	Presumed Dead	Florida	probably propeller cuts on both sides of dorsal flukes; flukes not functional
April 1994			Mortality	Ocracoke, NC	axillary hemorrhage ventral to left pectoral and posterior third of mandible
August 1995	female	Adult	Presumed Dead	Gulf of Maine	deep cut on right side of head below rostrum and cutting into the lower lip
October 1995	male		Mortality	Bay of Fundy, Long Island, Nova Scotia	gash in back
January 1996	male	Adult	Mortality	Sapelo, GA	shattered skull, broken vertebrae and ribs
March 1996	male	Adult	Mortality	Cape Cod, MA	3 m gash on back, broken skull
August 1997	female		Mortality	Bay of Fundy	traumatic impact on left side and lower jaw
January 1998		1 year	Non-fatal	Georgia	entire left fluke lop severed by propeller
October 1998			Mortality	NC/VA state line	
April 1999	female	27 yrs.	Mortality	Wellfleet, MA	fractures to mandible and vertebral column, abrasion and edema around right flipper
March 2001	male	Calf	Mortality	Assateague, VA	large propeller gashes on dorsal caudal and acute muscular hemorrhage
June 2001	female	Calf	Mortality	Long Island, NY	dorsal propeller wounds, sub-dermal hemorrhage

Exhibit 9A-1

SUMMARY OF COLLISIONS BETWEEN SHIPS AND WHALES: HUMPBACK WHALES, 1990 THROUGH 2002

Date	Sex	Length	Outcome[1]	Location	Notes
February 1990	female	11.1 m	Mortality	Nags Head, NC	broken mandible; head damage
June 1990			Unknown	Stellwagen Bank, MA	
June 1991			Minor	Stellwagen Bank, MA	whale-watching vessel (14 m)
November 1991	male	9.0 m	Mortality	Island Beach, NJ	fractured occipital condyle
February 1992	male	8.6 m	Mortality	Virginia Beach, VA	fractured mandible and eye socket; possible ship strike
March 1992	female	10.9 m	Mortality	Cape Hatteras, NC	propeller wounds on fluke
April 1992	female	8.9 m	Mortality	Assateague Island, MD	disarticulated skull, blunt trauma
April 1992	female	8.9 m	Mortality	Hatteras, NC	extensive skeletal damage
October 1992	female	8.7 m	Mortality	Metompkin Island, VA	bruising around axilla, dislocated mandible
October 1993			Severe	Atlantic City, NJ	private sport fishing vessel (10 m)
July 1994			Unknown	Stellwagen Bank, MA	
August 1994			Unknown	Gulf of Maine	
February 1995			Unknown	off NC	whale breached in front of submarine; slid down vessel's starboard; suspected right whale
August 1995	female	adult	Unknown	Gulf of Maine	cut 60-90 cm deep on right side of head
March 1996	male		Mortality	Wellfleet, MA	propeller cuts on back; skull broken
April 1996	female	7 m	Mortality	Virginia Beach, VA	fractured mandible
May 1996	female	7.3 m	Mortality	Cape Henlopen, DE	deep propeller cuts behind blowhole
November 1996	male	8.4 m	Mortality	Carrituck, NC	acute trauma to skull, blunt trauma to left lateral peduncle, fractured left squamosal
July 1997			Unknown	Cape Cod, MA	Coast Guard cutter (82 m)
September 1997			Minor	St. Lawrence Estuary, Canada	whale-watching vessel
December 1997	male	9.0 m	Mortality	Beaufort Inlet, NC	massive hemorrhaging consistent with forceful blunt trauma
June 1998			Unknown	Boston Harbor, MA	incident involved two whales
August 1998			Severe	Stellwagen Bank, MA	high-speed catamaran
May 2000			Unknown	Stellwagen Bank, MA	
July 2000			Unknown	Stellwagen Bank, MA	many focal hematomas on left side along ribs; but no broken bones
December 2000	male	8.5 m	Mortality	Cape Lookout, NJ	4 broken ribs; broken vertebral processes
January 2001		6.9 m	Mortality	Avon, NC	extensive hemorrhaging and clean cut through vertebrae
April 2001	male	7.9 m	Non-fatal	Myrtle Beach, SC	severe propeller wounds
July 2001	female	8.5 m	Mortality	NY	large laceration on left side of head, fractured skull
October 2001	female	11.4 m	Mortality	Duxbury Beach, MA	fractured skull, focal bruising indicative of pre-mortem ship strike
October 2001			Injury	Stellwagen Bank, MA	whale-watch vessel (11.7 knots)
August 2002			Mortality	Cape Henry, VA	

Exhibit 9A-1

SUMMARY OF COLLISIONS BETWEEN SHIPS AND WHALES: FIN WHALES, 1980 THROUGH 2001

Date	Sex	Length	Outcome[1]	Location	Notes
October 1979			Mortality	Baltimore, MD	
January 1980			Mortality	Portsmouth, VA	
February 1980			Mortality	Philadelphia, PA	
March 1981			Mortality	Atlantic City, NJ	brought into port on bow of ship
April 1982			Mortality	Portsmouth, VA	
June 1982			Mortality	Hog Island, VA	
August 1982			Mortality	Boston, MA	brought into port on bow of ship
January 1983			Mortality	Norfolk, VA	brought into port on bow of ship
January 1983			Mortality	Norfolk, VA	
July 1983			Mortality	Manhattan, NY	brought into port on bow of ship
October 1983			Mortality	Fire Island, NY	possible ship strike, slashes on left ventral side
March 1984			Mortality	Baltimore, MD	brought into port on bow of ship
August 1984			Injury	Stellwagen Bank, MA	whale-watch vessel (28 m)
July 1985			Unknown	Stellwagen Bank, MA	
August 1985			Mortality	Montauk, NY	possible ship strike, floating with propeller slashes
May 1986			Mortality	Hoboken, NJ	brought into port on bow of cruise ship
July 1986			Mortality	Delaware, NJ	reported struck by container ship
August 1987			Mortality	Boston, MA	brought into port on bow of ship
January 1988			Mortality	Marshfield, MA	possible ship strike
January 1988			Mortality	Cape Hatteras, NC	
May 1988			Mortality	Deal, NJ	
July 1989			Mortality	North Kingstown, RI	fractured lower jaw
November 1990	female	13.0 m	Mortality	Curtis Bay, MD	ship strike mark mid-lateral on left side
June 1992	female	15.6 m	Mortality	Long Beach Island, NJ	several fractured vertebrae
July 1992	male	17 m	Mortality	Port Newark, NJ	fractured vertebrae in midsection
August 1993		15 m	Mortality	Boston Harbor, MA	whale carried into harbor; likely ship strike
March 1994	female	16.0 m	Mortality	Virginia Beach, VA	flukes cut off
April 1994			Mortality	Penns Grove, NJ	broken vertebrae, blunt trauma to right pectoral fin
June 1995	male	8.8 m	Mortality	off Rudlet Inlet, VA	several major lacerations
August 1995		17 m	Mortality	off Cape Cod, MA	carried to St. George, Bermuda on the bow of a cruise ship
November 1995	female	10 m	Mortality	Charleston, SC	brought into port on bow of ship
February 1996	female	18 m	Mortality	off Sandy Hook, NJ	possible ship strike
April 1996			Mortality	Penns Grove, NJ	broken vertebrae, blunt trauma to right pectoral fin and surrounding area
July 1996	male	13.5 m	Mortality	Elizabeth, NJ	bow impact to left flank
March 1997		12 m	Mortality	off Virginia Beach, VA	
May 1997		12 m	Mortality	Boston Harbor, MA	possible ship strike
August 1997	female	16.8 m	Mortality	Eastham, MA	broken jaw, cracked scapula partially healed
March 1998	female	16.9 m	Mortality	Salvo County, NC	large hematoma and numerous broken vertebrae
March 1998			Mortality	Cape Henry, VA	
February 1999	male	15.5	Mortality	False Cape State Park, VA	large external wound, extensive fractures, hemorrhaging
November 1999	male	16.2 m	Mortality	Elizabeth, NJ	large wound anterior of the blowhole, severed left flipper, shattered bones
December 2000	female	10.9 m	Mortality	New York Harbor	hemorrhage and fractured bones on right side
January 2001	female	18.1 m	Mortality	New York Harbor	dorsal abrasion marks, hematoma
February 2001	female	14.5 m	Mortality	Port Elizabeth, NJ	brought into port on bow of ship

Exhibit 9A-1

SUMMARY OF COLLISIONS BETWEEN SHIPS AND WHALES: MINKE WHALES, 1975 THROUGH 2001

Date	Sex	Length	Outcome[1]	Location	Notes
July 1975			Mortality	Boothbay, ME	body heavily bruised
October 1975			Mortality	New Harbor, ME	
May 1988			Mortality	Duxbury Beach, ME	one large gash and three smaller gashes
March 1992	female	6.8 m	Mortality	St. Johns River, FL	propeller strike from a large vessel
March 1993		7.5 m	Mortality	New York Harbor	brought in on bow of ship
September 1993	male	4.3 m	Mortality	Ocean City, NJ	possible ship strike
October 1993			Mortality	Sandbridge, VA	left mandible broken
August 1994		2 m	Mortality	Hampton Roads, VA	lower jaw broken; possible ship strike
June 1995	female	3.7 m	Mortality	Piney Point, MD	large cut through skin on dorsal thorax
October 1995			Unknown	off Cape Cod, MA	Coast Guard cutter (64 m)
July 1996			No Injury	off Race Point, MA	whale hit; resurfaced, no sign of injury
June 1997			Mortality	Sandy Hook, NJ	spine broken
May 1998			Injury	6 nm N of Race Point, MA	
September 1998		6 m	Mortality	Barnstable, MA	
December 1998			Mortality	Cape Cod Bay, MA	body of whale seen in wake of a whale-watching vessel
June 1999		6 m	Mortality	Boston Harbor, MA	
June 2001		7.6 m	Mortality	30 nm southeast of Cape Cod	could have been a sei whale

Notes:

[1] Mortality refers to whales killed or possibly killed by vessel collisions from stranding records of dead whales along the U.S. East Coast (Maine to Dade County, Florida): 1975-1996. Data are from the Cetacean Distributional Database, Smithsonian Institution, Washington, D.C. and summarized in Laist et al. (2001).

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Exhibit 9A-2

GILLNET AND TRAP/POT FISHERIES
WITH DOCUMENTED TAKES OF SEA TURTLES IN THE NORTH ATLANTIC

State	Gillnet Fisheries		Trap/Pot Fisheries
Connecticut	Mixed Species		American Lobster
Delaware	Bluefish Croaker Monkfish Shad	Spot Sharks Striped Bass Weakfish	
Georgia			Blue Crab
Maine			American Lobster
Maryland	Atlantic Croaker Flounder Horseshoe crabs Monkfish	Shad Smooth/Spiny Dogfish Striped Bass Weakfish	American Lobster Crab Sea Bass
Massachusetts	American Plaice Atlantic Cod Dogfish Haddock Monkfish Pollock	Summer Flounder White Hake Windowpane Flounder Winter Flounder Witch Flounder Yellowtail Flounder	American Lobster Scup
New Jersey	Black Drum Bluefish Bonito Croaker Dogfish Flounder Mackerel	Menhaden Monkfish Scup Shad Skates Weakfish	Mixed Species American Lobster Crab
New York	Bluefish Dogfish Flounder	Monkfish Striped Bass Weakfish	American Lobster
Rhode Island	Mixed Species		American Lobster
South Carolina	Sharks		
Virginia	Bluefish Bonito Black Drum Croaker Gray Sea Trout King Mackerel Monkfish	Shad Smooth/Spiny Dogfish Scup Spot Summer Flounder Weakfish	Summer Flounder Black Sea Bass Blue Crab Tautog Whelks

Source: NOAA Office of Protected Resources. 2001. Strategy for Sea Turtle Conservation & Recovery in Relation to Atlantic Ocean and Gulf of Mexico Fisheries – Decision Memorandum. National Marine Fisheries Service, Silver Spring, MD.

Exhibit 9A-3

ANTICIPATED ANNUAL INCIDENTAL TAKE OF SEA TURTLES

Fishery	Sea Turtle Species		
	Loggerhead	**Leatherback**	**Kemp's Ridley**
Lobster	2	4	None
Multispecies	1	1	1
Spiny Dogfish	3	1	1
Monkfish Gillnet	3	1 non-loggerhead species	
Summer Flounder/Scup/Black Sea Bass	19[1]	None	see loggerhead entry
Red Crab	1	1	None
Jonah Crab EFP[2]	None	6	None
Southeast Shark Drift Gillnet	20	4	2

Notes:
[1] Includes Kemp's ridley.
[2] Represents an Incidental Take Statement issued for the three-year experimental Jonah crab trap fishery.

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Exhibit 9A-4

HISTORY OF SIGNIFICANT MANAGEMENT ACTIONS AND ASSOCIATED COMMUNITY IMPACTS: NORTHEAST MULTISPECIES FISHERY

Year	Action	Provisions that Affect Fishing Dependent Communities	Fishing Dependent Community Impacts
1977	Original FMP	• Cod, haddock, and yellowtail flounder annual and quarterly catch quotas • Quota allocations by vessel class • Trip or weekly catch limits	Moderate to High
1982	Interim Plan	• Georges Bank Closed Areas (seasonal) • Minimum mesh size requirements when fishing for cod, haddock, or yellowtail flounder in Georges Bank and portions of the Gulf of Maine • Minimum fish size requirements • Permit requirements	Moderate to High
1986	Multispecies Plan	• Inclusion of Pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder, and white hake • Additional minimum fish size requirements • Extension of Georges Bank spawning area closures to protect haddock (seasonal) • Establishment of a Southern New England closure to protect yellowtail flounder (seasonal)	Moderate
1987-1991	Amendments 1 – 4	• Closure of the Southern New England/Mid-Atlantic Yellowtail Area during March-May • Extension of Georges Bank Regulated Mesh Area • Minimum mesh size requirements in Southern New England • Exclusion of scallop dredge vessels from Southern New England closure • Minimum fish size changes • Gear restrictions in the Northern Shrimp fishery • Inclusion of silver hake, red hake, and ocean pout	Moderate to High
1994	Emergency Action	• Implementation of 500 lb. haddock trip limit • Expansion of CAII boundaries and extension of time from four months to six months • Prohibition of scallop dredge vessels from possessing haddock during January to June • Prohibition on pair-trawling for multispecies	Moderate
1994	Amendment 5	• Implementation of an effort reduction program for most vessels whereby historical DAS would be reduced by 50 percent over a five-to-seven year period • Implementation of the 1994 Emergency Action year-round • Moratorium on new entrants to the multispecies fishery • Increase in mesh size the Southern New England and Mid-Atlantic Regulated Mesh Area • Increase in mesh size in Gulf of Maine and Georges Bank Regulated Mesh Area • Minimum fish sizes • Suspension of CAI (except for gillnet vessels) • Mandatory reporting and observer requirements	High
1994	Amendment 6	• Implementation of March 1994 Emergency Action measures on a permanent basis	Moderate

Exhibit 9A-4

HISTORY OF SIGNIFICANT MANAGEMENT ACTIONS AND ASSOCIATED COMMUNITY IMPACTS: NORTHEAST MULTISPECIES FISHERY

Year	Action	Provisions that Affect Fishing Dependent Communities	Fishing Dependent Community Impacts
1994	Emergency Action	• Year-round closure of redefined CAI, the Nantucket Lightship Closed Area and CAII to protect cod, haddock, and yellowtail flounder • Prohibition on scallop vessels from fishing in the closed areas • A small mesh prohibition; a disallowance on any fishery utilizing mesh smaller than the minimum mesh size requirements with the exception of fisheries that have been determined to have a catch of less than five percent by weight of regulated species • Prohibition on retaining regulated species with a small mesh • Increase in Southern New England mesh size • Winter flounder exemption in state waters	High
1995	Framework 9	• Implementation of December 1994 Emergency Action measures on a permanent basis	High
1996	Amendment 7	• Acceleration of Amendment 5 DAS reduction schedule • Elimination of exemptions to effort control program • Implementation of seasonal Gulf of Maine closures • Implementation of a 1,000 lb. haddock trip limit • Expansion of the five percent bycatch rule, where vessels fishing in the Gulf of Maine/Georges Bank/Southern New England Regulated Mesh Areas are allowed to fish only in an exempted fishery, under a multispecies or scallop DAS, or under the Small Vessel permit category • Establishment of an annual target TAC for cod, haddock, and yellowtail flounder stocks, and expansion of framework provision to set annual TACs	High
1997	Framework 20	• Implementation of Gulf of Maine cod daily 1,000 lb. trip limit • Seasonal increase in haddock daily trip limit to 1,000 lb • Gillnet effort-reduction measures, including net limits	Moderate
1998	Framework 24	• Adjustment to Gulf of Maine cod trip limit – vessels must remain in port and run clock to account for cod coverage • Implementation of DAS carry-over provision • Implementation of NAFO exemption	Moderate
1998	Framework 25	• Implementation of Gulf of Maine Inshore Closure Areas • Implementation of year-round Western Gulf of Maine Closure Area • Addition of a seasonal offshore Gulf of Maine Closure Area (Cashes Ledge Closure Area) • Reduction in the Gulf of Maine cod daily trip limit to 700 lb.	High
1999	Framework 26	• Expansion of April Gulf of Maine Inshore Closure Area • Addition of seasonal inshore Gulf of Maine and Georges Bank area closures	Moderate
1999	Framework 27	• Elimination of the Northeast Closure Area • Establishment of seasonal inshore Gulf of Maine Rolling Closure Areas of greater size and duration than Inshore Closure Areas • Reconfiguration of the seasonal Cashes Ledge Closure Area and expansion in time from one month to four months	Moderate to High

Exhibit 9A-4

HISTORY OF SIGNIFICANT MANAGEMENT ACTIONS AND ASSOCIATED COMMUNITY IMPACTS: NORTHEAST MULTISPECIES FISHERY

Year	Action	Provisions that Affect Fishing Dependent Communities	Fishing Dependent Community Impacts
		• Exemption for scallop dredge vessels to fish within the Gulf of Maine Rolling Closure Areas and Cashes Ledge Closure Area • Limitation on roller and rockhopper trawl gear to a maximum diameter of 12 inches within a Gulf of Maine inshore area • Decrease in the Gulf of Maine cod daily trip limit to 200 lb., with mechanisms to reduce further if necessary (reduced to 30 lb. on 5/28/1999) • Increase in the haddock daily trip limit (2,000 lb.) • Increase in Gulf of Maine, Georges Bank, and Southern New England square mesh size	
1999	Interim Rule	• Gulf of Maine cod daily trip limit revision • DAS running clock revised-cod overage limit to one day	Moderate
1999	Amendment 9	• Prohibition on the use of Brush-Sweep Trawl gear • Inclusion of halibut into the FMP • Possession and size limit on halibut	Moderate
2000	Framework 31	• Increase in Gulf of Maine cod daily limit • Additional February inshore Gulf of Maine closure • Extension of 1999 Interim Rule running clock measure	Moderate
2000	Framework 33	• Addition of a Georges Bank Seasonal Closure • Addition of two one-month conditional Gulf of Maine Closure Areas • Increase in haddock daily trip limit (3,000 lb.)	Moderate
2002	Interim Action (Settlement Agreement Part I)	• Restriction on vessels using more than 25 percent of their DAS allocation during May-July 2002 • Modification of DAS clock – all vessel trips three to 15 hours counted as 15 hours during May-July 2002 • Year-round Cashes Ledge Area Closure • Expansion of Rolling Closure Area III and IV • Prohibition on front-loading the DAS clock • Increase in Gulf of Maine trawl and gillnet mesh • Limitation on Day gillnets	High
2002	Interim Action (Settlement Agreement Part II)	• May 2002 interim measures continued • Establishment of "used DAS baseline" and reduction of 20 percent from this baseline • Freeze on handgear permits and trip limit reduction • Increase in Southern New England trawl and gillnet mesh • Increase in Georges Bank gillnet mesh • Further limitations of both Day and Trip gillnet activity • Longline gear restrictions • Increase in commercial cod fish size • Possession limits and restrictions on yellowtail flounder catch • Increase in Gulf of Maine daily cod trip limit	High

Source: New England Fishery Management Council (NEFMC), Final Amendment 13 to the Northeast Multispecies Fishery Management Plan, Newburyport, Massachusetts, December 2003.