**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

OCT 1 2009

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act, an environmental review was performed on the following action:

| | |
|---|---|
| TITLE: | Modifications to the Harbor Porpoise Take Reduction Plan: Final Environmental Assessment (includes Regulatory Impact Review and Final Regulatory Flexibility Analysis) |
| LOCATION: | The state and federal waters of the Atlantic Ocean from Maine through North Carolina |
| SUMMARY: | A Marine Mammal Protection Act final rule will implement modifications to the HPTRP based on recommendations from the Harbor Porpoise Take Reduction Team for additional regulatory measures in New England and the Mid-Atlantic to reduce the serious injury and mortality of the Gulf of Maine/Bay of Fundy stock of harbor porpoises due to incidental interactions with commercial gillnet fisheries. These measures include, but are not limited to, the creation of additional management areas, expansion of existing management areas, establishment of a consequence closure area strategy, and incorporation of a scientific research provision. Non-regulatory conservation measures are also included such as intensive education and outreach efforts. |
| RESPONSIBLE OFFICIAL: | Patricia A. Kurkul<br>Regional Administrator, Northeast Region<br>National Marine Fisheries Service<br>55 Great Republic Drive<br>Gloucester, MA 01930 |

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement is not being prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA) is enclosed for your information. Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

# MODIFICATIONS

# TO THE

# HARBOR PORPOISE TAKE REDUCTION PLAN

**Final Environmental Assessment**
**(Includes Regulatory Impact Review and**
**Final Regulatory Flexibility Analysis)**

**September 2009**

**United States Department of Commerce**
**National Oceanic and Atmospheric Administration**
**National Marine Fisheries Service**
**Northeast Region**

## TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## 1.0 INTRODUCTION

This Environmental Assessment (EA) evaluates potential environmental impacts associated with a National Marine Fisheries Service (NMFS) proposed rule under the Marine Mammal Protection Act (MMPA) of 1972 to modify the regulations implementing the Harbor Porpoise Take Reduction Plan (HPTRP) to reduce serious injury and incidental mortality of the Gulf of Maine/Bay of Fundy (GOM/BOF) stock of harbor porpoises (*Phocoena phocoena*) in Northeast and Mid-Atlantic Category I commercial gillnet fisheries. The following general requirements are proposed as described in Alternative 4 (Preferred): the expansion of the management areas and seasons in New England in which pingers are required, the establishment of "consequence closure areas" in New England which will close if bycatch rates over two consecutive years indicate that harbor porpoise takes are greater than a specified target bycatch rate, the addition of a management area in which additional gear restrictions and a closure period are proposed within the Waters off New Jersey Management Area in the Mid-Atlantic, and a gear modification change requested by Mid-Atlantic gillnet fishermen.

### 1.1 Purpose and Need

This action is needed to reduce the level of harbor porpoise bycatch incurred through commercial fishing operations to levels below the stock's potential biological removal (PBR) level in order to satisfy NMFS' responsibilities under the MMPA. The purpose of this action is to implement measures such as gear restrictions, closed areas and seasons, expanded pinger use, and outreach efforts to reduce fishing gear interactions with harbor porpoises.

In part, the MMPA provides protection for species or stocks that are, or may be, in danger of extinction or depletion as a result of human activities. In 1994, Congress amended the MMPA to establish provisions to govern the taking of marine mammals incidental to commercial fishing operations. These provisions include the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction (16 U.S.C. 1362). They also include the development and implementation of take reduction plans for stocks that may be reduced or are below their optimum sustainable population due to interactions with commercial fisheries (16 U.S.C. 1387(f)). Optimum sustainable population is defined in the MMPA as the number of animals which will result in the maximum productivity of the population or species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.

Take reduction plans (TRPs) are required for all "strategic stocks" that interact with Category I or II fisheries (as categorized on the annual MMPA List of Fisheries). Under the MMPA, a "strategic stock" is a stock: (1) for which the level of direct human-caused mortality exceeds the stock's PBR level, (2) that is declining and is likely to be listed under the Endangered Species Act (ESA) of 1973 in the foreseeable future, or (3) that is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA (16 U.S.C. 1362 (19)). PBR is defined in the MMPA as "the maximum number of animals that may be removed from a marine mammal stock annually (not including natural mortalities) while allowing that stock to reach or maintain its optimum sustainable population" (16 U.S.C. 1362 (20)). Because the current

average annual human-related mortality and serious injury of harbor porpoises exceeds the stock's PBR level, the stock is considered a strategic stock under the MMPA.

The immediate goal of a TRP is to reduce, within six months of implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of U.S. commercial fishing operations to below the PBR levels established for such stocks. The long-term goal of a TRP is to reduce, within five years of its implementation, the incidental mortality and serious injury of strategic stocks taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate (known as the zero mortality rate goal, or ZMRG) taking into account the economics of the fishery or fisheries, the availability of existing technology, and existing State or Regional fishery management plans. NMFS has defined ZMRG as 10% of a marine mammal stock's PBR level (69 FR 43338, July 20, 2004).

Regulations implementing the HPTRP became effective January 1, 1999 (63 FR 66464, December 2, 1998 and as corrected by 63 FR 71041, December 23, 1998), and were slightly amended in 2001 (66 FR 2336, January 11, 2001). Prior to the development of the HPTRP, the bycatch estimate of the GOM/BOF stock of harbor porpoises exceeded PBR by more than threefold, with an estimated 1,500 animals taken per year in U.S. commercial gillnet fisheries between 1994 and 1998. After implementation of the HPTRP, harbor porpoise bycatch decreased and remained below PBR until 2004. However, bycatch showed an increasing trend after 2001, and again exceeded PBR beginning in 2004 (Table 1-1). The 2007 Stock Assessment Report (SAR) indicated that the average annual mortality from 2001 through 2005 was 652 harbor porpoises per year in U.S. commercial fisheries, exceeding the PBR of 610 animals (Waring et al., 2007a). Preliminary bycatch estimates for the period between 2002 and 2006 suggests the mean annual mortality of harbor porpoises in U.S. commercial fisheries rose further, to 866 (D. Palka, pers comm).

**Table 1-1: U.S. Fishery-Related Mortality Estimates for the GOM/BOF Stock of Harbor Porpoises**

| Years | Best Estimated Population Size | PBR | Mean Annual Mortality |
|---|---|---|---|
| 1994-1998 | 54,300 animals | 483 animals/year | 1,521 animals/year |
| 1999-2001 | 89,700 animals | 747 animals/year | 310 animals/year |
| 1999-2003 | 89,700 animals | 747 animals/year | 417 animals/year |
| 2000-2004 | 89,700 animals | 747 animals/year | 515 animals/year |
| 2001-2005 | 89,054 animals | 610 animals/year | 652 animals/year |
| 2002-2006 | 89,054 animals | 610 animals/year | 866 animals/year |

Sources: Waring et al. (2000), Waring et al. (2004), Waring et al. (2006), Waring et al. (2007a), Waring et al. (2007b), Waring et al. (2009).

Based on the above information, NMFS reconvened the Harbor Porpoise Take Reduction Team (HPTRT) in December 2007 to review and discuss the most recent harbor porpoise abundance and bycatch information and to evaluate additional potential measures that may be necessary to reduce harbor porpoise bycatch back to levels below PBR.

The proposed modifications to the HPTRP, developed through consultation with the HPTRT and described in this EA, are intended to reduce harbor porpoise mortalities and serious injuries in Northeast and Mid-Atlantic commercial gillnet fisheries to levels below PBR and approaching ZMRG, thus satisfying NMFS' responsibilities under the MMPA.

### 1.1.1 Scope of the Analysis

The measures contained within the alternatives chosen for technical analysis are within the scope of the purpose and need for modifications to the HPTRP, are technically feasible, and were discussed by the HPTRT. NMFS considered published and peer reviewed scientific reports and HPTRT recommendations to develop these alternatives. The alternatives include suites of measures that affect the commercial Northeast sink gillnet and Mid-Atlantic gillnet fisheries from New England through the Mid-Atlantic to the North Carolina/South Carolina border, which covers the core range of the GOM/BOF harbor porpoise population within U.S. waters. The measures described in each alternative would amend the existing HPTRP.

Briefly, the alternatives analyzed in this EA include:

- **Alternative 1 (No Action):** This alternative maintains the status quo HPTRP.

- **Alternative 2:** In addition to the existing HPTRP measures, this alternative would seasonally close areas of high harbor porpoise bycatch to commercial gillnet fishing.

- **Alternative 3:** This alternative would seasonally require pingers on commercial gillnet gear throughout the New England and Mid-Atlantic areas.

- **Alternative 4 (Preferred):** Alternative 4 presents a comprehensive suite of measures, including: 1) expansion of management areas and seasons in New England; 2) implementation of "consequence" closure areas if bycatch rates within certain management areas as observed over two consecutive years exceed a specified bycatch rate, suggesting low compliance with the pinger requirements; 3) modification to the tie-down requirement as requested by gillnet fishermen using large mesh gear in the Mid-Atlantic; and 4) addition of a new management area within the Waters off New Jersey Management Area, in which both closures and more stringent gear modifications to large and small mesh gillnets would be required seasonally.

- **Alternative 5 (Modified Alternative 4):** Alternative 5 includes the suite of actions proposed in Alternative 4 (Preferred), as well as three additional elements: 1) incorporation of the year-round Western Gulf of Maine Closure Area (currently required by the Northeast Multispecies Fishery Management Plan) into the regulations implementing the HPTRP under the MMPA; 2) elimination of the HPTRP Offshore Management Area in the Gulf of Maine (GOM); and 3) elimination of the Southern Mid-Atlantic Management Area closure period for large mesh gillnet gear from February 15 to March 15.

A complete description of these alternatives can be found in Section 2 (Summary of Management Alternatives) of this EA, and detailed analyses of the effects of these alternatives can be found in Section 4 (Effects of the Management Alternatives).

## 1.2 Management History

### 1.2.1 Harbor Porpoise Conservation under the Endangered Species Act

Federal management of the incidental bycatch of harbor porpoises began in 1989 when fishermen, environmental organizations, and scientists formed the Harbor Porpoise Working Group. The goal of the Harbor Porpoise Working Group was to define the extent of the bycatch problem in U.S. fisheries, and to identify potential solutions to reduce the incidental take of harbor porpoises in gillnet gear while minimizing impacts on the fishery.

In 1991, NMFS announced its intent to review the status of the harbor porpoise population in U.S. waters for a possible listing as threatened or endangered under the ESA. At the time during which NMFS was reviewing harbor porpoise status, the Sierra Club Legal Defense Fund, on behalf of the International Wildlife Coalition and 12 other organizations, submitted a request to NMFS on September 18, 1991 asking to list harbor porpoises as threatened under the ESA. In response to the petition and after considering the results of its research, NMFS published a proposed rule on January 7, 1993 (58 FR 3108) to list harbor porpoises as threatened under the ESA.

In a status review completed in 1999 (64 FR 465, January 5, 1999), NMFS determined that listing the GOM/BOF stock of harbor porpoises as threatened under the ESA was not warranted. NMFS also published a notice retaining the population on the ESA candidate species list to continue to monitor the species' status and the results of implementation of the HPTRP (64 FR 480, January 5, 1999). On August 2, 2001 (66 FR 40176), NMFS published a draft review of the biological status of the GOM/BOF stock of harbor porpoises, which considered new information that had become available since NMFS' previous harbor porpoise status review. In this draft status review, NMFS made the preliminary determination that listing the GOM/BOF stock as threatened under the ESA was not warranted and that NMFS intended to remove harbor porpoises from the ESA candidate species list. The 1999 status review notice and the August 2001 draft status review notice also provided information on the background of ESA actions involving the GOM/BOF stock of harbor porpoises, reviewed available scientific and commercial fishery information affecting the species, evaluated the status of the species according to criteria listed in the ESA, and described regulatory measures in place to address harbor porpoise mortality and serious injury incidental to commercial fishing activities. On October 19, 2001 (66 FR 53195), NMFS published a final determination not to list the harbor porpoise as threatened under the ESA and also removed it from the list of candidate species.

### 1.2.2 Management of Harbor Porpoise Incidental Bycatch under the Northeast Multispecies Fishery Management Plan

In October 1992, NMFS requested that the New England Fishery Management Council (NEFMC) develop a plan for reducing harbor porpoise bycatch in the Northeast sink gillnet

fishery through the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). As part of Amendment 5 to the Northeast Multispecies Fishery Management Plan (FMP), implemented on March 1, 1994 (59 FR 9872), the NEFMC created the Harbor Porpoise Review Team and proposed a four-year program to reduce harbor porpoise bycatch off New England to two percent of the estimated harbor porpoise population size per year. To achieve this goal, the NEFMC recommended phasing in time and area closures to sink gillnet gear to reduce bycatch levels by 20 percent each year over the four year period. NMFS implemented the first year closure recommendations on May 25, 1994 (59 FR 26972).

In the fall of 1994, NMFS authorized and provided support for a cooperative experiment by New England gillnet fishermen and scientists. Building on work from previous years, the experiment attempted to evaluate the effectiveness of pingers attached to gillnet gear to prevent the entanglement of harbor porpoises. The experiment was conducted in the Mid-Coast Closed Area (closed under Amendment 5 to the Northeast Multispecies FMP) off the coast of New Hampshire and Massachusetts. The result of that experiment indicated that pingers can substantially reduce the bycatch of harbor porpoises during the fall in this area (Kraus et al., 1997a).

On July 1, 1996, the NEFMC implemented Amendment 7 to the Northeast Multispecies FMP (61 FR 27710, May 31, 1996), which included additional marine mammal seasonal area closures in addition to groundfish closures in the GOM. The objective of Amendment 7 in regard to harbor porpoises was to reflect the 1994 amendments to the MMPA and to reduce proportionately the incidental mortality and serious injury of harbor porpoises in the Gulf of Maine sink gillnet fishery to below the PBR level. The PBR level was identified as 403 animals per year through the process described in Section 117 (Stock Assessments) of the MMPA. The date required for compliance with TRP requirements of the MMPA (16 U.S.C. 1387 (f)) was April 1, 1997, one year earlier than the bycatch reduction schedule established by Amendment 5 to the Northeast Multispecies FMP.

On October 29, 1996, the NEFMC implemented Framework Adjustment 19 (61 FR 55774), which reported extensively on the 1994 pinger experiment conducted by Kraus et al. (1997a) and an experimental fishery that tested the effectiveness of pingers in the Mid-Coast Closure Area in 1995 and 1996. Framework Adjustment 19 also opened the Mid-Coast Closure Area in November and December to allow access for gillnets equipped with pingers.

### 1.2.3 Gulf of Maine and Mid-Atlantic Harbor Porpoise Take Reduction Teams

As discussed, the 1994 amendments to the MMPA require the preparation and implementation of TRPs for strategic marine mammal stocks that interact with Category I or II commercial fisheries. The GOM/BOF stock of harbor porpoises is currently a strategic stock with frequent or occasional interactions with two Category I fisheries, the Northeast sink gillnet fishery and the Mid-Atlantic gillnet fishery. A notice published in the *Federal Register* on February 12, 1996 (61 FR 5384) announced the establishment of the Gulf of Maine Harbor Porpoise Take Reduction Team (GOMTRT) and announced the first GOMTRT meeting. The goal of the GOMTRT was to develop a consensus draft HPTRP to reduce the incidental take of harbor porpoises in sink gillnets in the Gulf of Maine to below the PBR level within six months of implementation. The GOMTRT met five times between February and July, 1996 before

producing a consensus draft TRP that was submitted to NMFS on August 8, 1996. NMFS limited the geographic scope of the 1996 GOMTRT to focus only on bycatch off the coast of New England (Maine to Rhode Island). This was due to the high proportion of incidental bycatch in the Northeast multispecies sink gillnet fishery that constituted the majority of the total fishery-related mortality in the U.S. Additionally, there was uncertainty about the extent of fisheries interactions in waters south of New England. Data on the bycatch of harbor porpoises in the Mid-Atlantic were not available until 1996 due to low observer effort prior to 1995 and the lag in availability of appropriate effort data to estimate bycatch. The GOMTRT convened with the understanding that a separate take reduction team (TRT) would be convened to address harbor porpoise bycatch in the Mid-Atlantic. The GOMTRT included representatives of the Northeast sink gillnet fishery, NMFS, state marine resource management agencies, the NEFMC, the Atlantic States Marine Fisheries Commission (ASMFC), environmental organizations, and academic and scientific organizations.

Soon after the GOMTRT submitted its draft TRP to NMFS, the NEFMC enacted Framework Adjustment 19 (61 FR 55774, October 29, 1996) to the Northeast Multispecies FMP, which changed the time and area of the Northeast Multispecies FMP Mid-Coast Closure Area within the Gulf of Maine and established an exemption to allow sink gillnet vessels to fish inside the reopened area when utilizing pingers on their nets. Based on this action, NMFS modified the draft HPTRP to be consistent with Framework Adjustment 19 and published a proposed rule to implement a HPTRP for harbor porpoises in the Gulf of Maine (62 FR 43302, August 13, 1997).

In February 1997, NMFS convened the Mid-Atlantic Harbor Porpoise Take Reduction Team (MATRT) to address the incidental bycatch of harbor porpoises in Mid-Atlantic gillnet fisheries from New York through North Carolina. The MATRT included representatives of the Mid-Atlantic and Northeast gillnet fisheries, NMFS, state marine resource management agencies, the Mid-Atlantic Fishery Management Council (MAFMC), the NEFMC, the ASMFC, environmental organizations, and academic and scientific organizations. Although the MATRT did not reach consensus on all issues discussed, the MATRT submitted a report to NMFS on August 25, 1997 which included both consensus and non-consensus recommendations.

On September 11, 1998, NMFS published a proposed rule (63 FR 48670) for the HPTRP that included both the GOMTRT and MATRT proposals as one management plan. This replaced the first proposed rule that published on August 13, 1997 (62 FR 43302). A final rule implementing the HPTRP was published on December 2, 1998 (63 FR 66464). Shortly following, a correction notice to the final rule was published (63 FR 71041, December 23, 1998). On January 11, 2001, NMFS published a final rule (66 FR 2336) amending the HPTRP by exempting Delaware Bay from HPTRP regulations landward of the 72 COLREGS demarcation line.

The GOMTRT and MATRT were last convened (separately) in 2000. Both were accustomed to meeting separately to discuss harbor porpoise interactions with commercial gillnet fisheries and potential mitigation measures on a regional level. However, to address the recent increase in harbor porpoise bycatch, NMFS decided to combine the two TRTs and hold one full HPTRT meeting. First, since it had been nearly eight years since either TRT had met, the updated stock abundance and bycatch information presented would be pertinent to both TRTs. Additionally, some members had served on both the GOMTRT and MATRT, and would receive redundant

information if two separate meetings were held. Finally, limited resources could be conserved by holding one full HPTRT meeting. Therefore, during the summer of 2007, NMFS canvassed the GOMTRT and MATRT members to inquire about each individual member's interest in continuing to serve on the HPTRT. Based on the responses received, NMFS updated the HPTRT member roster to ensure a well-balanced, knowledgeable TRT that would be committed to working together toward forming consensus recommendations.

### 1.2.4 Reconvening the Harbor Porpoise Take Reduction Team

The HPTRT was reconvened in December 2007 and is made up of thirty eight members drawn from the previous MATRT and GOMTRT. The HPTRT includes twelve Mid-Atlantic and Northeast gillnet fishermen or their representatives, four members from Federal agencies, one participant from each of ten coastal State agencies, three participants from conservation groups, three from fishery management organizations, three from academic institutions, and three gear researchers. Two meetings were held recently: a three-day meeting from December 17 – 19, 2007 in Philadelphia, Pennsylvania, and a teleconference on January 31, 2008 to focus on items from the December meeting that lacked consensus or required clarification. Thirty-five of the 38 HPTRT members attended one or both of the meetings. The proposed modifications to the HPTRP, as well as the other alternatives considered within this EA, were developed through these consultations with the HPTRT to reduce mortalities and serious injuries of harbor porpoises in the Northeast and Mid-Atlantic commercial gillnet fisheries to levels below PBR.

### 1.2.5 Harbor Porpoise Take Reduction Plan

The HPTRP regulations, implemented on December 2, 1998 (63 FR 66464) are categorized by GOM and Mid-Atlantic components. The Environmental Assessment and Regulatory Flexibility Analysis conducted for that rulemaking is incorporated here by reference (NMFS, 1998). The GOM component of the HPTRP (50 CFR 229.33) manages commercial gillnet gear that catches or is capable of catching multispecies through time and area regulations throughout New England, from Maine to Rhode Island, during the months of August through May. This consists of seasonal gillnet closures during the peak months of the year during which harbor porpoises are most concentrated in four of the six GOM management areas. During several other times of the year when harbor porpoise concentrations are considered to be less than at the peak time periods, the HPTRP management areas require the use of pingers on all sink gillnet gear. Pingers are placed approximately every 300 ft (91.4 m) on a string of gillnets and broadcast a ten kilohertz (kHz) sound at 132 decibels every four seconds to alert and/or deter harbor porpoises. Before using pingers on gillnet gear inside HPTRP management areas, fishing vessel operators must complete pinger training administered by NMFS to review the current HPTRP management measures and ensure that pingers are properly deployed and maintained. Those who complete the training are required to carry on board their vessel a NMFS-issued pinger training authorization in order to fish in management areas that require pingers.

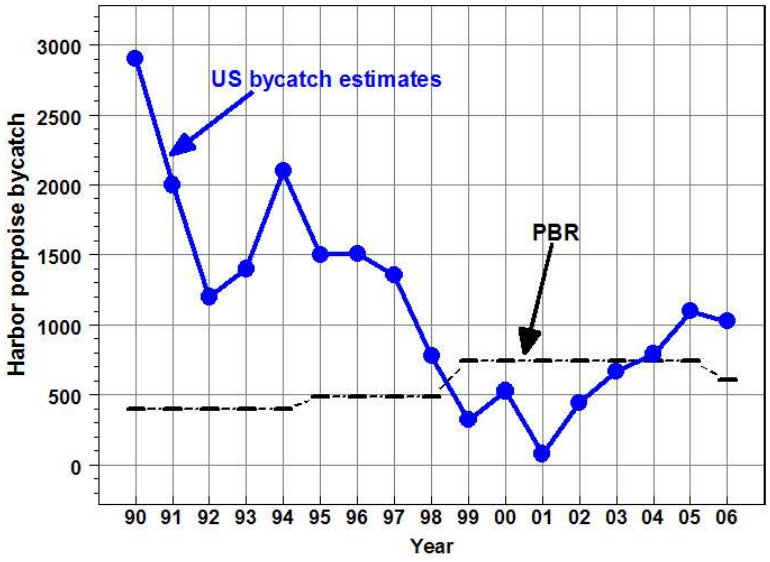
The Mid-Atlantic component of the HPTRP (50 CFR 229.34) manages commercial gillnet fishing through time and area regulations from New York through North Carolina from January through April. In lieu of pinger requirements, the Mid-Atlantic component of the HPTRP established large and small mesh gear specification requirements in which fishermen set gear

that is less likely to result in harbor porpoise entanglement. Large mesh gillnets include gillnets with a mesh size of seven to 18 inches (18 – 46 cm) and small mesh gillnets include gillnets with a mesh size of greater than five to less than seven inches (13 -18 cm). Gear specification requirements for Mid-Atlantic gillnets include measures specifying a net limit per net string, twine size, net size, number of nets per vessel, and tie-down provisions. The three management areas of the Mid-Atlantic component of the HPTRP also include seasonal gillnet closures to coincide with high abundances of harbor porpoises.

#### 1.2.5.1 A Review of the Effectiveness of the HPTRP

As discussed, prior to the development and implementation of the HPTRP in late 1998, the bycatch estimate of the GOM/BOF stock of harbor porpoises in U.S. gillnet fisheries exceeded 1,500 animals per year in the 1990s, well over the PBR of 483 animals (Table 1-1). Along with implementation of the HPTRP, restrictions implemented under various FMPs have closed areas to gillnet fishing and reduced or constrained effort in groundfish, monkfish, and dogfish gillnet fisheries. Harbor porpoise bycatch decreased to below the PBR level and remained below PBR between 2001, when the most recent HPTRP modification was implemented (66 FR 2336, January 11, 2001), and 2003. Despite these measures, harbor porpoise takes showed an increasing trend since 2001 (Figure 1-1) and have exceeded PBR each year since 2004 rather than approaching ZMRG.

**Figure 1-1: Annual harbor porpoise bycatch (harbor porpoise takes per metric tons of landings) compared to PBR from 1990-2006**




Note that in the current HPTRP, the management areas in New England are termed "closure areas," although some do not contain a complete closure period (for example, the Offshore Closure Area). During the December 2007 meeting, the HPTRT requested that NMFS modify the area names to avoid confusion. This proposed action will replace the term "closure" with the

term “management” in both New England and the Mid-Atlantic unless the area exists only as a complete closure (for example, the Cashes Ledge Closure Area). Therefore, for the remainder of this EA, the new naming scheme will be used except when describing Alternative 1 (No Action).

NMFS analyzed post-HPTRP gillnet fishery observer data from different geographic areas to determine whether there were patterns in the overall increase in harbor porpoise bycatch in U.S. gillnet fisheries.

New England Waters

Within Appendix A, Section 5, Palka et al. (2008a) review observer data collected in the GOM between January 1, 1999 and May 31, 2007. Observed harbor porpoise takes in this area and period occurred in gear targeting a variety of fish species, including American cod, monkfish, pollock, other flounders, spiny dogfish, unknown groundfish, and yellowtail flounder. The highest bycatch rates were observed in the Northeast Multispecies FMP Western GOM Closure Area (0.056 harbor porpoise takes per observed metric tons (takes/mtons) of landings) and the HPTRP Mid-Coast Management Area (0.052 takes/mtons). The unregulated area between the Massachusetts Bay Management Area and the Multispecies Western GOM Closure Area (proposed in this action as the Stellwagen Bank Management Area) also had a relatively high bycatch rate (0.040 takes/mtons). No takes were observed in the Offshore Management Area and no hauls were observed in the Northeast Closure Area. Bycatch was observed in each month of the year, with the highest bycatch rates observed in February and November. The number of vessels using at least 90% of the required number of pingers in times and areas when pingers were required varied throughout the time period examined. Approximately 75% of observed vessels used the proper number of pingers in 1999. This number dropped to a low of 10% in 2003 and 2004, and rose again to about 60% between January and May of 2007.

Section 4 of Palka et al. (2008a) (see Appendix A) analyzes observer data collected on gillnet vessels operating in waters south of Cape Cod from January 1, 1999 through May 31, 2007. Waters south of Cape Cod were defined as the waters within the Cape Cod South Management Area and waters surrounding this management area. All observed harbor porpoise takes occurred during the months from December through May in gear targeting monkfish or winter skate. The bycatch rate outside of the Cape Cod South Management Area (i.e., no pingers were required because this area currently is not regulated under the HPTRP) was 0.102 takes/mtons, about 50% higher than the bycatch rate observed in the Cape Cod South Management Area (0.066 takes/mtons), where pingers and closures are seasonally required. Of the 1,665 hauls observed in the Cape Cod South Management Area during the period and season that pingers are required, 47% were deployed with 90% or more of the required number of pingers. Forty percent did not have any pingers, and the remaining 13% had fewer than 90% of the required number of pingers.

A trend of increasing bycatch rates was apparent for the area south of Cape Cod. Annual bycatch rates from January 1, 1999 through May 31, 2007 were: 0.028 takes/mtons (in 1999), 0.092 takes/mtons (in 2000), 0 takes/mtons (in 2001), 0.081 takes/mtons (in 2002), 0.046

takes/mtons (in 2003), 0.058 takes/mtons (in 2004), 0.095 takes/mtons (in 2005), 0.119 takes/mtons (in 2006), and 0.124 takes/mtons (from January 1 through May 31, 2007).[1]

Mid-Atlantic Waters

An analysis of observer data collected on gillnet vessels fishing within the Waters off New Jersey Management Area between January 1, 1999 and May 31, 2007 is given in Section 3 of Palka et al. (2008a) (see Appendix A). Most of the observed takes occurred in and around the Hudson Canyon area (in or near the existing Mudhole Management Area) and all occurred in large mesh gillnet gear targeting monkfish from January through April. A number of factors appeared to correlate well with increased bycatch rates. Net strings using large mesh sizes (7-18 inches stretched mesh) that were greater than 4,000 ft (1,219 m) in total length entangled harbor porpoises three times more often than net strings that were less than 4,000 ft (1,219 m) in total length. All of the takes occurred in net strings with soak times that were greater than 48 hours even though 37% of the observed hauls and 19% of the landings were from nets that had soaked for fewer than 48 hours. Nets hauled after more than one week had a fivefold greater harbor porpoise bycatch rate than hauls of nets that soaked for one week or less.

Many (60%) of the observed hauls of large mesh gillnets were out of compliance with at least one of the gear restrictions of the HPTRP, and 65% of the harbor porpoise takes occurred in gear that was out of compliance with the HPTRP. In the Mudhole and also in the Waters off New Jersey Management Area, fifty two percent of the observed large mesh hauls had floatline lengths greater than the allowable net string length (3,900 ft (1,189 m) in the Mudhole Management Area, and 4,800 ft (1,463 m) in the Waters off New Jersey Management Area), which was the most common occurrence of non-compliance recorded for large mesh gillnets in this area. Observer effort for large mesh gillnet hauls was very low in some years (2000 – 2003). However, it appears that compliance rates for the Waters off New Jersey Management Area show a pattern similar to that seen in New England. Compliance rates fell off after the first few years of the HPTRP implementation, and increased in 2007 (to 90% through May) after outreach occurred.

A total of eight harbor porpoise takes were observed in the Southern Mid-Atlantic Management Area between January 1, 1999 and May 31, 2007 (section 2 in Palka et al., 2008a) (see Appendix A). All of the observed takes occurred in February, March, or April, which is when the HPTRP is in effect in these waters. Half of the observed takes occurred in the shad fine mesh gillnet fishery (≤5 inches, 13 cm), which was closed in 2005. The other four observed takes were in large mesh gillnet hauls targeting monkfish or striped bass. All four of these hauls were out of compliance with the HPTRP gear modification requirements (twine size and/or net string length). Throughout the HPTRP management season, only 21% of all the large mesh hauls observed in this area were fishing in compliance with the current regulations; no takes were observed in these compliant hauls. Observed large mesh hauls that were out of compliance used twine sizes that were too small (10%), did not use tie-downs (54%), and/or occurred during the February 15 through March 15 large mesh closure period (30%). No takes were observed in

[1] The bycatch rates were calculated using the months in which the Cape Cod South Management Area requirements were in effect (December through May). The data from 1999-2006 include January through May and December, and the data from 2007 include January through May only.

small mesh nets, although 35% of these nets were out of compliance, primarily with the twine size requirement (i.e., using twine sizes that were too small).

Summary

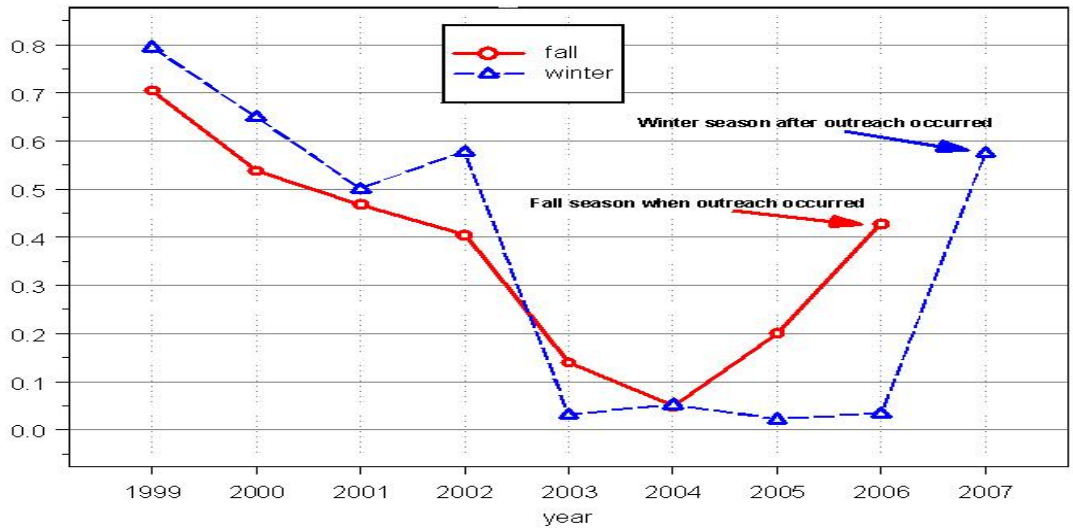
In support of HPTRT discussions during the December 2007 meeting, D. Palka provided a quick calculation of the estimated harbor porpoise bycatch if there had been 100% compliance with the current HPTRP requirements during 2005 and 2006. This calculation and its methods can be found as Attachment 1 within Appendix B (Key Outcomes Memorandum from the December 2007 HPTRT meeting) or as a stand-alone peer-reviewed report in Appendix C (Palka, 2008). Even with full compliance, Palka (2008) estimated a predicted annual bycatch of 651 harbor porpoises in 2005 and 630 in 2006. While these estimates are greatly below the actual 2005 (1,100) and 2006 (1,026) harbor porpoise bycatch mortality and serious injury estimates, they exceeds the current PBR of 610 harbor porpoise mortalities or serious injuries.

Based on these observer data, NMFS and the HPTRT concluded that the primary issues contributing to the observed increase in harbor porpoise takes in U.S. commercial gillnet fisheries include poor compliance with the existing HPTRP, and increased bycatch outside of existing management areas.

#### 1.2.5.1.1 NMFS Outreach and Enforcement Efforts

The existing HPTRP requires commercial gillnet fishermen operating in the HPTRP management areas during seasons in which pingers are required to complete pinger training, verified through receipt of a training authorization to be kept onboard their fishing vessel. Despite this requirement, in December 2004, when the 2003 observer data were fully analyzed, a precipitous drop in the percentage of observed hauls using nets with the proper number of pingers was noted (Figure 1-2).

**Figure 1-2: Percent of observed hauls that used the correct number of pingers per string in times/areas when pingers were required**



On February 16, 2005, NMFS sent a letter and outreach information outlining all of the requirements of the HPTRP to Gulf of Maine and Mid-Atlantic gillnet fishermen from Maine to North Carolina. In August of 2005, NMFS responded to a letter sent by the NEFMC and noted concerns about compliance with the regulations implementing the HPTRP. After a review of recent observer information depicting the locations of gillnet hauls in which harbor porpoise takes were recorded, NMFS concluded that the increased takes of harbor porpoises was a two-pronged problem, which not only involved non-compliance with the current HPTRP requirements, but also included observed harbor porpoise takes occurring outside of existing HPTRP management areas.

These data prompted NMFS to initiate a targeted HPTRP outreach effort in the fall of 2006. This included the development of laminated outreach cards summarizing and graphically depicting the HPTRP management areas and requirements for Northeast and Mid-Atlantic gillnet fisheries. In October 2006, the laminated outreach cards and a laminated pinger training authorization were mailed to over 300 fishermen who had previously received pinger training. The pinger training authorization, when kept on board the vessel, allows gillnet fishing with pingers inside the HPTRP management areas and illustrates proper pinger placement.

Additionally, between October 3, 2006 and November 15, 2006, eight outreach meetings, which included pinger training opportunities, were held throughout New England from Maine through Rhode Island. Outreach meeting locations included Portland, ME, Portsmouth, NH, Gloucester, MA (two meetings), Duxbury, MA, Fairhaven, MA, Chatham, MA, and Narragansett, RI. A ninth outreach meeting was held in Point Pleasant, NJ in January 2007. These voluntary outreach meetings were intended to provide commercial gillnet fishermen with an update on the status of the HPTRP, to summarize the existing HPTRP requirements for both New England and the Mid-Atlantic, and to provide pinger training where necessary (New England only). Specific issues raised during these meetings included changes in harbor porpoise distribution and abundance, questions related to seal depredation and possible attraction to pinger sounds, inquiries about the reasons for continuation of the March gillnet closures in the Massachusetts Bay and Cape Cod South Management Areas, and requests for updates on harbor porpoise related gear research. The outreach meetings supplemented ongoing efforts by NMFS gear specialists to train local and Federal enforcement personnel. As such, NMFS and U.S. Coast Guard (USCG) enforcement agents also attended the outreach meetings.

In addition to conducting outreach to gillnet fishermen, NMFS personnel participated in enforcement cruises with state enforcement personnel in Massachusetts and Rhode Island, and meetings were held periodically with local law enforcement personnel, including eight presentations made in New England between 2003 and 2008. Beginning in 2005, the USCG increased patrols in HPTRP management areas in the Gulf of Maine. During March of 2006, the Massachusetts Environmental Police joined the USCG in their patrols. Increased patrols continued into 2007. As a result of these increased efforts, an investigation is ongoing regarding a gillnet fisherman operating in the Mid-Coast Management Area in November of 2006 without pingers.

In New England, as Figure 1-2 shows, compliance rates (as indicated by the percent of observed hauls using the correct number of pingers per string when pingers were required) dropped significantly between 2002 and 2003, when fewer than 10% of the observed hauls were deployed with the proper number of pingers. In the fall of 2006, while the outreach meetings were ongoing, an increase in compliance was already evident. Through May of 2007, compliance in 2007 increased to almost 60%.

Pinger sales during this time also reflect improved compliance. Airmar Technology Corporation, the company from which most fishermen buy pingers, saw a rapid increase in demand from 400 pingers ordered in 2003 and again in 2004, to 1,500 in 2005, 900 in 2006, and 3,000 in 2007 (J. Higgins, pers comm). The company could not fully respond to the increase in demand in 2007 due to a shortage of parts, which led to a delay in processing pinger orders. However, within approximately two months, the issue was remedied. A second company that provides pingers primarily to West Coast fisheries, Fumunda Marine Products, saw their sales rise from 50 pingers in 2006 to 110 in 2007.

In the Mid-Atlantic, NMFS gear specialists held two meetings (in 2003 and 2005) with the Law Enforcement Committee of the ASFMC to review the current requirements of the HPTRP. As mentioned above, NMFS conducted its final outreach meeting with gillnet fishermen in Point Pleasant, New Jersey in January of 2007 to review the requirements of the HPTRP in the Mid-Atlantic. Specific issues discussed during this outreach meeting included the need for a reduction in soak times (although not a HPTRP requirement) and a review of the restriction on the number of nets per string, as longer strings typically result in higher harbor porpoise bycatch. Compliance rates in the Waters off New Jersey increased to 90% through May of 2007, immediately following the outreach meeting.

Clearly, outreach programs, along with the deterrence of increased enforcement efforts, rapidly improved apparent compliance for gillnet vessels operating in the areas and seasons in which HPTRP requirements are in place in New England and the Mid-Atlantic

#### 1.2.5.1.2 Effectiveness of Gear Modifications of the Existing HPTRP

New England

Experiments on the effectiveness of pingers for reducing harbor porpoise bycatch in gillnet gear were conducted in the waters off New Hampshire in the 1990s. During these experiments, Kraus et al. (1997a) documented a ten-fold reduction in the incidental capture of harbor porpoises in pingered nets; 25 harbor porpoises were captured in 423 control nets (without pingers) and two harbor porpoises were taken in 421 pingered nets. These results largely led to the area and seasonal pinger requirements implemented in the Gulf of Maine gillnet fishery. Pingers were first required in 1996 through the Northeast Multispecies FMP and were implemented more broadly on January 1, 1999 through the HPTRP. Fluctuations in bycatch rates of harbor porpoises and seals in gillnets deployed with the appropriate number of pingers and the associated lack of inter-annual trends in these rates suggest that early concerns that these animals might become habituated to the pingers appear to be unfounded (Palka et al., 2008b) (see Appendix D).

Observer data for gillnet hauls in the GOM between January 1, 1999 and May 31, 2007 are analyzed in Appendix D (Palka et al., 2008b). In all management areas, harbor porpoise bycatch rates for hauls without pingers were greater than the bycatch rates of hauls with the required number of pingers, confirming the effectiveness of pingers as a harbor porpoise deterrent when properly deployed. The data indicate, however, that gillnet strings must have all of the required number of pingers and those pingers must be working properly to effectively reduce harbor porpoise bycatch. On average, nets with only 80% of the required number of pingers had bycatch rates similar to nets with no pingers. Although the sample size is small, and the operating conditions of the pingers are unknown, the data suggest that nets with fewer than the required number of pingers had bycatch rates that were higher than nets with no pingers at all. A possible explanation is that harbor porpoises may correlate a gap in pingers with a gap in the net and try to swim through the portion of the net string that does not contain pingers. While the present data are insufficient to examine this more closely, NMFS observers are collecting more detailed information on the functionality of the pingers on nets surrounding a harbor porpoise take. In summary, these findings confirm the need for regulations that compel fishermen to properly install and maintain all necessary pingers, as well as the need for NMFS and the New England states to continue outreach and enforcement efforts.

Mid-Atlantic

Assessment of the effectiveness of the individual gear modification requirements of the HPTRP in the Mid-Atlantic is difficult, since many of the factors are interrelated. Palka et al. (2008a) analyzed observer data from the Mid-Atlantic gillnet fisheries between January 1, 1999 and May 31, 2007 (Appendix A) and identified a number of gear variables that appear to relate to a high bycatch rate. However, many of these variables occur in the same nets. For example, large mesh size, use of tie-downs, use of more anchors, and long soak times all occur in nets targeting monkfish. In addition to these variables, net string length appears to relate to higher bycatch rates in large mesh nets. Bycatch in large mesh hauled nets with string lengths greater than 4,000 ft (1,219 m) was three times higher than bycatch rates in hauled nets with string lengths less than 4,000 ft (1,219 m). Currently, large mesh gillnet fishermen fishing between January 1 and April 30 (except during closure periods) in the Waters off New Jersey Management Area are required to use nets strings that are no longer than 4,800 ft (1,463 m) in length, and strings no longer than 3,900 ft (1,189 m) are allowed in the Mudhole Management Area during this period. String length was the most common non-compliant factor identified in hauls observed in the Waters off New Jersey, where 28 (65%) of 43 observed harbor porpoise takes were in non-compliant gear, and 60% of all hauls observed were non-compliant.

Observer data displayed in Figures 3.2 and 3.3 in Appendix A (Palka et al., 2008a) show a large number of takes just south and east of the current Mudhole Management Area, outside the area in which more restrictive gear modifications and closures are required. The bycatch analysis identifies a strong relationship between a higher than average bycatch rate in the Waters off New Jersey, including the Mudhole, and the water temperature of the observed haul (waters less than 43° F, ~6° C), water depths (164- 361 ft, 50 – 110 m), large mesh size, and location of the observed haul. This analysis supports the seasonal requirements and location of the existing Mudhole Management Area. However, it also identifies an area of high bycatch rates south and east of the Mudhole Management Area that merits consideration for further restrictions.

## 2.0 SUMMARY OF MANAGEMENT ALTERNATIVES

As discussed in Section 1, the HPTRT was reconvened and participated in meetings in December 2007 and January 2008. Prior to the December 2007 meeting, NMFS produced a paper identifying a number of issues contributing to the observed increase in harbor porpoise takes, primarily poor compliance with existing measures and increased bycatch outside of existing management areas. The NMFS discussion paper (Appendix E) summarized bycatch information and identified initial options to help initiate HPTRT discussions regarding possible modifications to the HPTRP. During their deliberations, the HPTRT considered a broad range of management measures, summarized in the meeting Key Outcomes Memos and associated follow-up materials found in Appendix B and F. The array of alternatives developed for this EA include many of the possible actions discussed at the meetings, combined within suites of measures affecting the range of the GOM/BOF harbor porpoise population within U.S. waters. Detailed analyses of the effects of these alternatives can be found in Section 4.

### 2.1 Non-Regulatory Components

The HPTRT achieved consensus on a number of non-regulatory actions that NMFS will pursue outside of the proposed rulemaking described here. The HPTRT reached consensus on the need to expand outreach and enforcement efforts to ensure that fishermen understand the regulations and to improve compliance. In addition to continued and enhanced outreach and enforcement, the HPTRT broadly supported the development of a cooperative agreement between NMFS and the New England coastal states to implement a pinger certification program, although no formal certification procedure beyond the current as-needed pinger training is proposed at this time. Enhancement of enforcement and observer efforts, including the purchase and distribution of improved pinger field testing units, is ongoing.

### 2.2 Alternatives to Modify the HPTRP

A wide range of management alternatives considered by the HPTRT, including an expansion of gear restriction and closure areas and seasons, and expanded pinger use, is analyzed in this EA. Non-regulatory actions that received broad support, such as outreach, education, pinger training, and enforcement, will be implemented and are part of all of the following suites of alternatives that will be considered.

A number of technical amendments will be also made while the regulations implementing the HPTRP are being revisited.

- Text will be changed to make clear that functional pingers must be attached every 300 ft (91.4 m), as originally intended. The current text indicates the pingers must be attached at the end of each string of gillnets and on the bridles between nets. The final EA on the initial HPTRP (NMFS, 1998) described Gulf of Maine fishing practices as using nets that are 50 fathoms (300 ft) long. Additionally, in the pinger experiments conducted in the mid- to late-1990s, each net was 300 ft (91.4 m) in length, and pingers were placed at the bridles, where individual nets were attached to each other (Kraus et al., 1997a; Kraus et

al., 1997b). The Northeast Multispecies FMP regulations (50 CFR 648.80) specify a maximum gillnet panel length of 300 ft (91.4 m or 50 fathoms). However, gillnet fishermen that are not fishing under a Multispecies or Monkfish permit that are regulated by the HPTRP may use longer nets. As such, the HPTRP must clearly indicate that in net panels that are longer than 300 ft in length, pingers must be spaced 300 or fewer feet apart.

- A number of Management/Closure Area boundary coordinates and labels will be modified for clarification, consistency, or correction. Particularly, the description of the western boundary for the exempted waters in Virginia from Chincoteague to Ship Shoal Inlet (currently landward of 37° 52'N, 75° 24.30'W to 37° 11.90'N, 75° 48.30'W) as described in 50 CFR 229.34(a)(2) will be modified by replacing this line with the 72 COLREGS demarcation lines to be consistent with the Bottlenose Dolphin Take Reduction Plan (BDTRP) and the Atlantic Large Whale Take Reduction Plan (ALWTRP) exemption lines for this area. Additionally, the northern boundary of the Waters off New Jersey Management Area will be changed from the existing 40° 40'N boundary further north to the south coast of Long Island, located at 40° 50.1'N, 72° 30'W (compare Figure 2-2 with Figure 2-9). Currently, the graphic of the Waters off New Jersey Management Area and the regulatory text definition of this area in the final rule implementing the HPTRP (63 FR 66464, December 2, 1998) do not agree. This revised definition would make the boundary of the Waters off New Jersey consistent with 50 CFR 229.34(a)(1), Regulated Waters, and the boundary of the List of Fisheries definition of the Mid-Atlantic gillnet fishery. Other modifications to boundaries will correct errors in labels between regulatory text and graphics within the final rule (63 FR 66464, December 2, 1998), or in tables within the regulations (50 CFR 229.33 and 50 CFR 229.34).
- The current regulatory text for restrictions in the Mid-Coast Management Area (50 CFR 229.33(a)(2)) neglects to state that vessels may fish with the use of pingers during the "closure" period despite the fact that this exemption was indicated in both the final EA on the initial HPTRP (NMFS, 1998) and the final rule implementing the HPTRP (63 FR 66464, December 2, 1998). Both documents describe the Mid-Coast Closure Area regulations as requiring pingers from September 15 through May 31. This regulatory text will be edited.
- The Mid-Atlantic gear modification regulations (50 CFR 229.34(c) as described in the final rule implementing the HPTRP at 63 FR 66464, December 2, 1998) specify both the maximum floatline length (string length) and the maximum net size allowable within the three management areas in this region, indirectly identifying the limit on the maximum number of nets per string. Observer data suggest that a large percentage of gillnet gear exceeds the intended maximum level of gear. To ensure clarity, the regulatory text will be amended to specify the maximum number of net panels allowed per net string in the Mid-Atlantic Management Areas.

These technical amendments correct or clarify the regulations implementing the HPTRP. Beyond improving comprehension of and associated compliance with the measures, these changes are not expected to modify the effects of the HPTRP and are not analyzed within this EA. The adoption of these technical amendments received full consensus from the HPTRT during the December 2007 meeting.

Additionally, a provision will be included in the regulations to allow research to be conducted within the HPTRP management areas by researchers that are authorized through a marine mammal scientific research permit. Current HPTRP regulations make no exemption for scientific research on methods to reduce harbor porpoise bycatch in the HPTRP management areas when restrictions are in effect, despite the HPTRT's repeated recommendation that NMFS promote harbor porpoise bycatch reduction research. Because the NMFS Permits Division's scientific research permit process includes a National Environmental Policy Act (NEPA) analysis, regional review, and public comment period, inclusion of an analysis of this provision is not required within this EA. The adoption of this research provision received full HPTRT consensus during the December 2007 meeting.

As noted above in Section 1.2.4.1, the HPTRT, for the purpose of discussion and for future regulations, requested modification of the titles of specific regulatory areas (currently termed "closure" areas) to better reflect the actual management actions implemented in those areas. For all of the alternatives discussed below, except Alternative 1 (No Action), area names are modified to reflect this request. In this EA, and in the revised regulatory text, the term "Closure Area" will be used only for those areas in which a closure is the only management measure. The term "Management Area" will be used for those areas in which pingers or gear modifications, in some cases in combination with seasonal closures, are required.

### 2.2.1 Alternative 1: No Action (Status Quo)

Under Alternative 1 (No Action), the current HPTRP regulations would remain unchanged, and no additional restrictions would be implemented. The current regulations (50 CFR 229.33-34) affect all gillnet fisheries that may take harbor porpoises in areas that coincide with harbor porpoise distribution. Figures 2-1 and 2-2 at the end of this section depict the management areas under the HPTRP in both New England and the Mid-Atlantic.

In New England, six management areas illustrated in Figures 2-1 (termed "closure areas" in the current regulations) have been established within which pingers or closures are required seasonally. The areas include the Northeast Closure Area, the Mid-Coast Closure Area, the Massachusetts Bay Closure Area, the Offshore Closure Area, the Cashes Ledge Closure Area, and the Cape Cod South Closure Area. Below, the HPTRP management area requirements for New England are described in more detail.

<u>New England Closure Areas</u>

- <u>Northeast Closure Area</u> – This area is closed from August 15 through September 13 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies.
- <u>Mid-Coast Closure Area</u> **–** This area is closed from September 15 through May 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies, except gillnet vessels with pingers deployed on the nets.
- <u>Massachusetts Bay Closure Area</u> – This area is closed from December 1 through February 28 (or 29) and April 1 through May 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies, except gillnet vessels with pingers deployed on the nets. This area is closed from March 1 through March 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies.

- Cape Cod South Closure Area – This area is closed from December 1 through February 28 (or 29) and April 1 through May 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies, except gillnet vessels with pingers deployed on the nets. This area is closed from March 1 through March 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies.
- Offshore Closure Area – This area is closed from November 1 through May 31 to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies, except gillnet vessels with pingers deployed on the nets.
- Cashes Ledge Closure Area – This area, which is located within the Offshore Closure Area, is closed from February 1 through February 28 (or 29) to all vessels using sink gillnet gear or gillnet gear capable of catching Northeast multispecies.

NMFS has set forth pinger specifications under the HPTRP such that when immersed in water they broadcast a 10 kHz (±2 kHz) sound at 132 decibels (dB), ±4 dB, re 1 micropascal at 1 meter, lasting 300 milliseconds (±15 milliseconds), and repeating every 4 seconds (± 0.2 seconds). Additionally, one pinger must be attached at each end of a gillnet string and at the bridle of every net within the gillnet string. To ensure that vessel operators know how to properly use pingers, operators are required to complete a one-time pinger training, and must have a pinger training authorization, issued by NMFS, on board the vessel when fishing in management areas in which pingers are required.

The Mid-Atlantic region has been divided into two large management areas (Waters off New Jersey and Southern Mid-Atlantic Waters, Figure 2-2) within which seasonal closures and large (7 – 18 inches, or 18 – 46 cm) and small (>5 to <7 inches, or >13 to <18 cm) mesh gillnet gear modifications are required from January 1 through April 30. One smaller area, the Mudhole Closure Area, is located within the Waters off New Jersey and contains an additional closure and more stringent large and small mesh gear modification requirements. Below, the HPTRP management area requirements for the Mid-Atlantic are described in more detail.

Mid-Atlantic Closure Areas

- Waters off New Jersey – This area is closed from April 1 through April 20 to all fishing with large mesh gillnet gear.
- Mudhole Closure Area – In addition to the large mesh gillnet closure from April 1 through April 20 for the Waters off New Jersey, this area is closed from February 15 through March 15 to all fishing with large or small mesh gillnet gear.
- Southern Mid-Atlantic Waters – This area is closed from February 15 through March 15 to all fishing with large mesh gillnet gear.

Mid-Atlantic Gear Restrictions

- Waters off New Jersey
    - Large Mesh Gillnet Gear
        - *Floatline Length*: Less than or equal to 4,800 ft (1,463 m)
        - *Twine Size*: Greater than or equal to 0.90 mm (0.035 inches)

        - *Tie-Downs*: Spaced not more than 15 ft apart along the floatline; not more than 48 inches in length from the point it connects to the floatline to the point where it connects to the leadline
        - *Net Number*: Not to exceed 80 nets per vessel
        - *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
        - *Number of nets per string*: Not to exceed 16 nets per string
        - *Net Tagging*: Requires all nets to be tagged by January 1, 2000
    - Small Mesh Gillnet Gear
        - *Floatline Length*: Less than or equal to 3,000 ft (914.4 m)
        - *Twine Size*: Greater than or equal to 0.81 mm (0.031 inches)
        - *Tie-Downs*: Prohibited
        - *Net Number*: Not to exceed 45 nets per vessel
        - *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
        - *Number of nets per string*: Not to exceed 10 nets per string
        - *Net Tagging*: Requires all nets to be tagged by January 1, 2000

- Mudhole Closure Area
    - Large Mesh Gillnet Gear
        - *Floatline Length*: Less than or equal to 3,900 ft (1,188.7 m)
        - *Twine Size*: Greater than or equal to 0.90 mm (0.035 inches)
        - *Tie-Downs*: Spaced not more than 15 ft apart along the floatline; not more than 48 inches in length from the point it connects to the floatline to the point where it connects to the leadline
        - *Net Number*: Not to exceed 80 nets per vessel
        - *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
        - *Number of nets per string*: Not to exceed 13 nets per string
        - *Net Tagging*: Requires all nets to be tagged by January 1, 2000
    - Small Mesh Gillnet Gear
        - *Floatline Length*: Less than or equal to 3,000 ft (914.4 m)
        - *Twine Size*: Greater than or equal to 0.81 mm (0.031 inches)
        - *Tie-Downs*: Prohibited
        - *Net Number*: Not to exceed 45 nets per vessel
        - *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
        - *Number of nets per string*: Not to exceed 10 nets per string
        - *Net Tagging*: Requires all nets to be tagged by January 1, 2000

- Southern Mid-Atlantic Waters
    - Large Mesh Gillnet Gear
        - *Floatline Length*: Less than or equal to 3,900 ft (1,188.7 m)
        - *Twine Size*: Greater than or equal to 0.90 mm (0.035 inches)
        - *Tie-Downs*: Spaced not more than 15 ft apart along the floatline; not more than 48 inches in length from the point it connects to the floatline to the point where it connects to the leadline
        - *Net Number*: Not to exceed 80 nets per vessel
        - *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
        - *Number of nets per string*: Not to exceed 13 nets per string
        - *Net Tagging*: Requires all nets to be tagged by January 1, 2000
    - Small Mesh Gillnet Gear

- *Floatline Length*: Less than or equal to 2,118 ft (645.6 m)
- *Twine Size*: Greater than or equal to 0.81 mm (0.031 inches)
- *Tie-Downs*: Prohibited
- *Net Number*: Not to exceed 45 nets per vessel
- *Net Size*: No longer than 300 ft (91.4 m or 50 fathoms)
- *Number of nets per string*: Not to exceed 7 nets per string
- *Net Tagging*: Requires all nets to be tagged by January 1, 2000

**Figure 2-1: Alternative 1 (No Action) - Existing HPTRP Management Measures in New England**

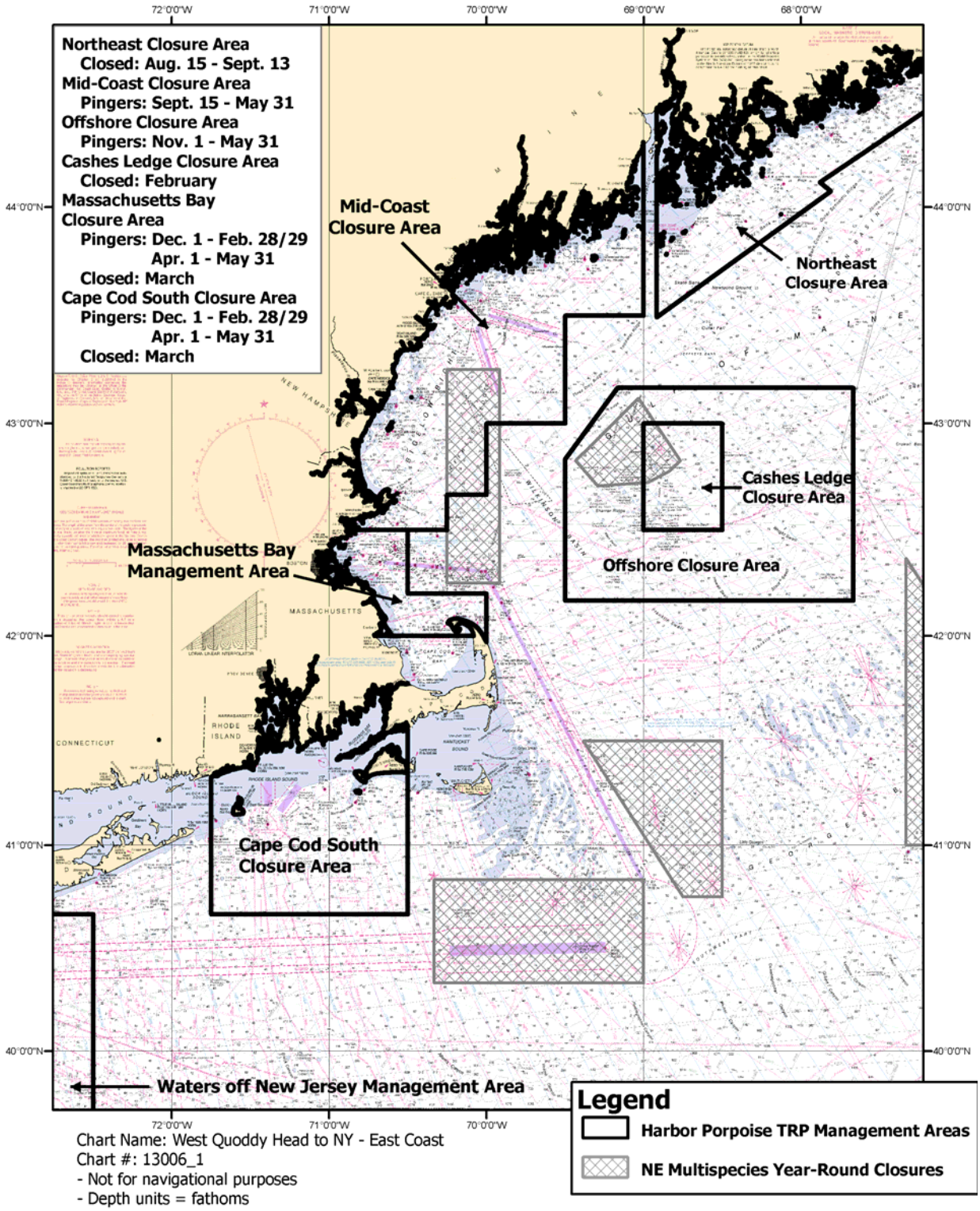


**Figure 2-2: Alternative 1 (No Action) - Existing HPTRP Management Measures in the Mid-Atlantic**

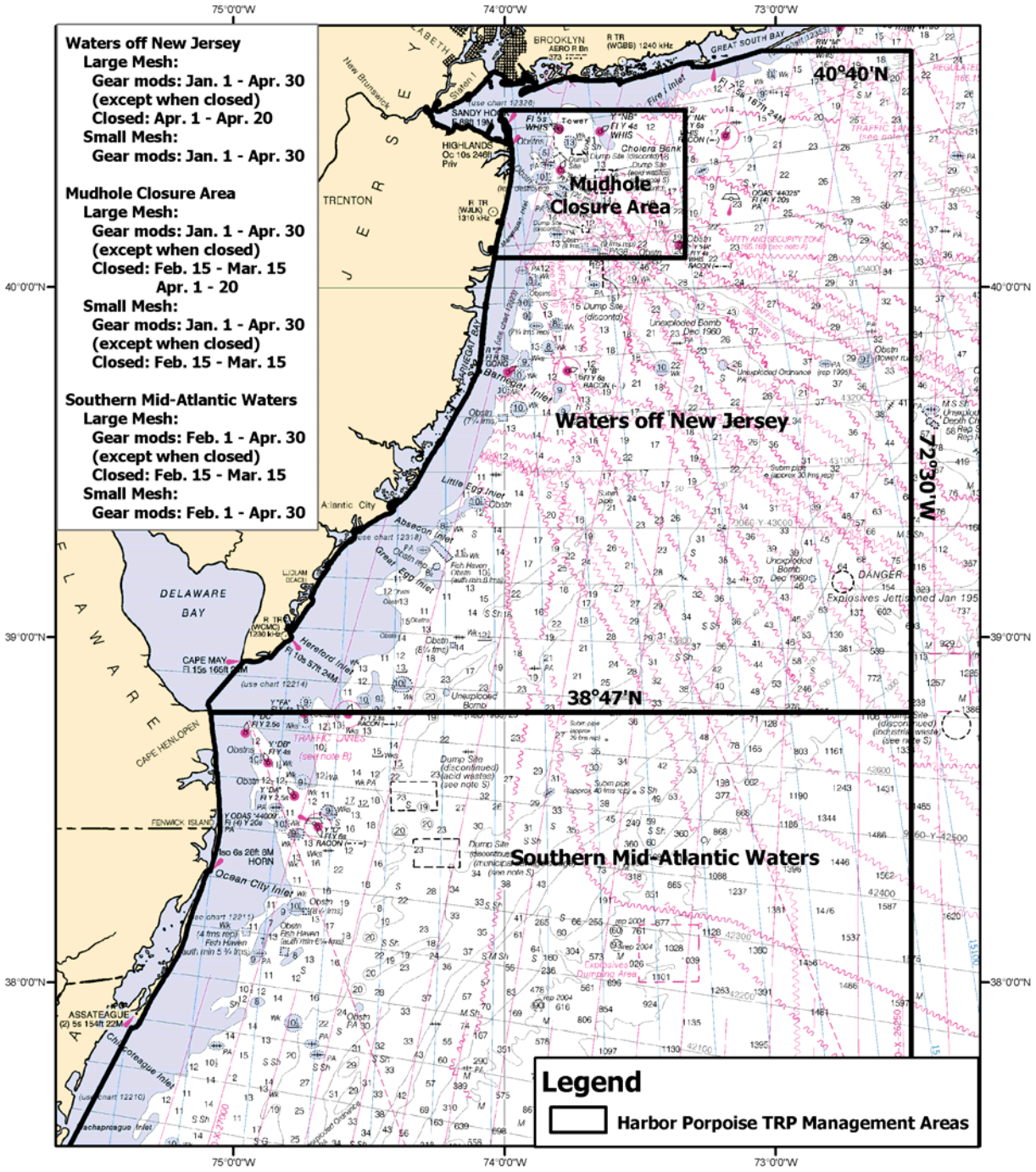



Chart Name: Cape Sable to Cape Hatteras
Chart #: 13003_1
- Not for navigational purposes
- Depth units = fathoms

- Note that the southern boundary of the Southern Mid-Atlantic Management Area is the NC/SC border (33°51'N)

### 2.2.2 Alternative 2: Closures

Alternative 2 would immediately implement closures, in addition to the existing measures of the HPTRP described in Alternative 1 (No Action). Figures 2-3 and 2-4 at the end of this section depict the management areas under Alternative 2 in both New England and the Mid-Atlantic.

Members of the HPTRT from environmental and academic organizations opined that the erosion of compliance rates in the nine years since the regulations have been implemented negated the effectiveness of seasonal pinger requirements in New England. They proposed the closure of areas and periods of observed high bycatch in New England. An alternative to implement immediate closures in New England did not receive support and was not fully discussed; therefore, no specific areas were discussed by the HPTRT for this option. Rather, the areas identified here were developed through discussions with the HPTRT for use as "consequence" closure areas, as fully described in Alternative 4 (Preferred). Consequence areas were developed within broader management areas to be closed only as a consequence of two consecutive years of observations of bycatch rates higher than rates expected under high compliance with the pinger requirements. Although closures received broad support as consequence areas, the HPTRT did not discuss immediate closure of these or any other specific areas in New England.

In the Mid-Atlantic, the closure area incorporates an area of high bycatch observed outside of current management periods and areas. During their December meeting, the HPTRT reached full consensus, with one abstention, on the creation of the Mudhole South Management Area. This management area is located to the south and east of the current Mudhole Closure Area and includes a February 1 to March 15 closure to large and small mesh gillnet fisheries.

Note that when the below areas are not closed, the current HPTRP requirements as described in Alternative 1 would be in effect.

<u>New England Closures</u>

- <u>Coastal Gulf of Maine Closure Area</u> would be closed in October and November (Figure 2-3). This closure area includes a portion of the current Mid-Coast Management Area, the Massachusetts Bay Management Area, and a new area between the Massachusetts Bay Management Area and the Multispecies Western GOM Closure Area, called the Stellwagen Bank Management Area. This entire new area was proposed for consideration as a "consequence" area to the HPTRT by the states of Maine, Massachusetts, and New Hampshire in their proposal prepared for the January 31, 2008, teleconference (see Appendix F, and Alternative 4 (Preferred)).
- <u>Eastern Cape Cod Closure Area</u> would be closed February through April (Figure 2-3). This closure area extends from the "elbow" of Cape Cod at 41º 40'N, east to 69º 30'W, and north to the southern border of the Western GOM Closure Area at 42° 15' N, west to 70º 00'W, and south to the shoreline of Cape Cod. The area was first proposed to the HPTRT on February 29, 2008, to supplement the "consequence" areas that the HPTRT adopted for southern New England in their December 2007 meeting, as discussed in Alternative 4.

- Cape Cod South Expansion Closure Area would be closed from February through April (Figure 2-3). This area, adopted as a "consequence" area by the HPTRT at their December 2007 meeting, includes the Cape Cod South Management Area, as well as an adjacent area extending south to 40º 00' N, east to 70º 00' W, north to 40º 40'N, west to 70º 30'N, and north to the shoreline of Cape Cod, incorporating an area of high observed porpoise bycatch.

Mid-Atlantic Closure

- Mudhole South Closure Area would be closed to large and small mesh gillnets from February 1 through March 15 (Figure 2-4). At the December 2007 meeting, the full HPTRT reached consensus, with one abstention, on the establishment of an area south and east of the existing Mudhole Management Area and the implementation of a February 1 through March 15 closure.

**Figure 2-3: Alternative 2 - Immediate Implementation of Closures in New England**

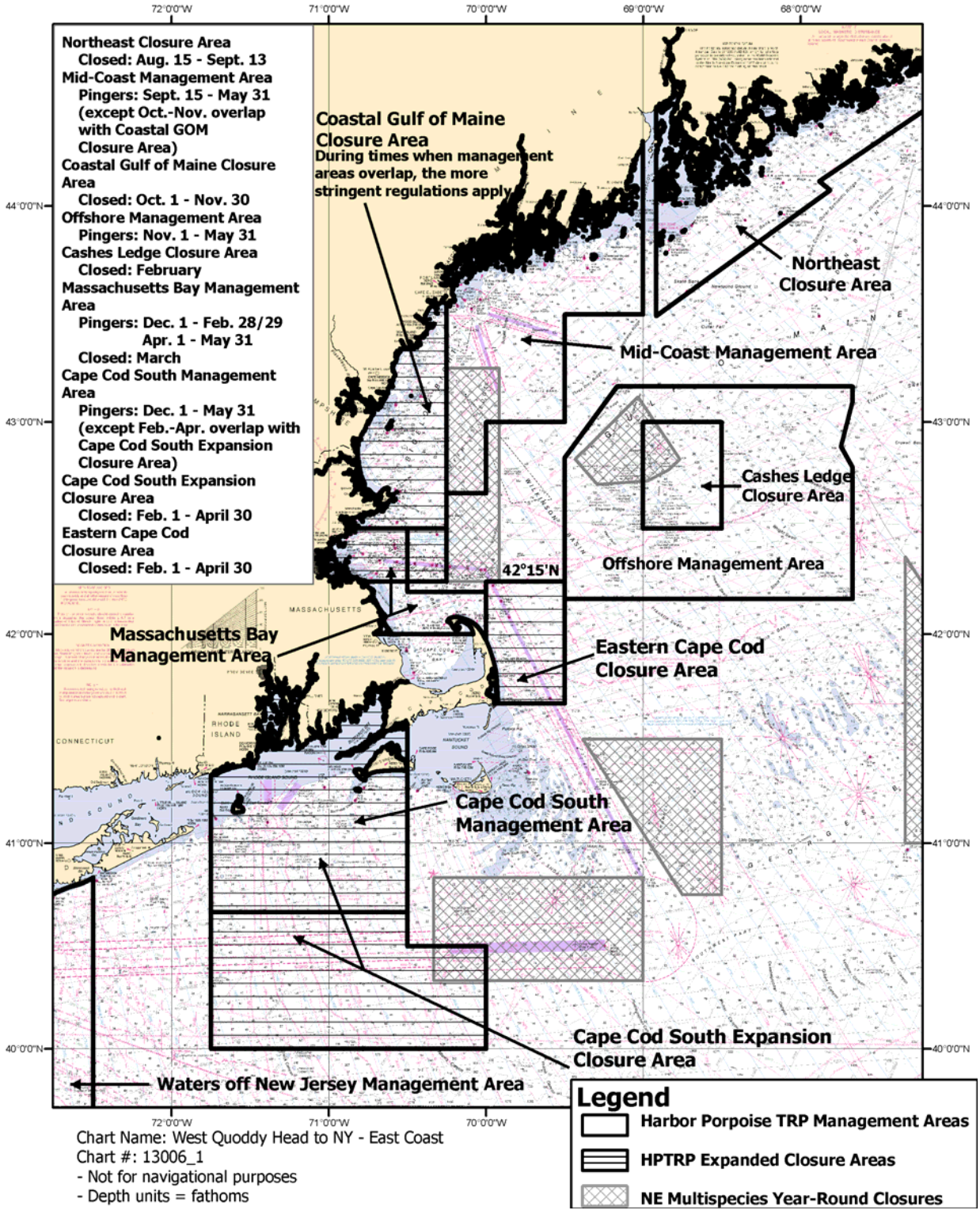


**Figure 2-4: Alternative 2 - Immediate Implementation of Closures in the Mid-Atlantic**

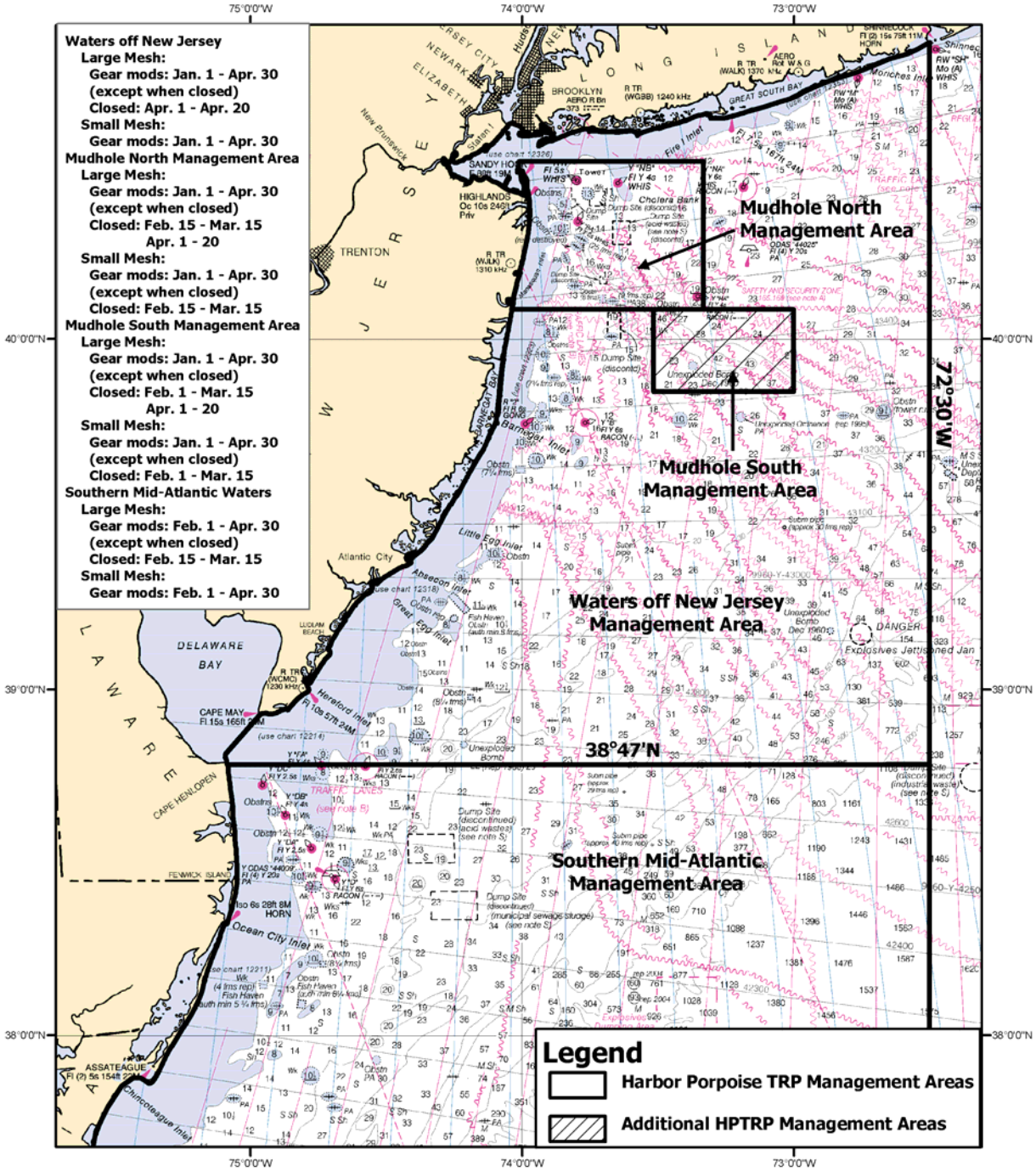



Chart Name: Cape Sable to Cape Hatteras
Chart #: 13003_1
- Not for navigational purposes
- Depth units = fathoms

- Note that the southern boundary of the Southern Mid-Atlantic Management Area is the NC/SC border (33°51'N)

### 2.2.3 Alternative 3: Pingers

This alternative would seasonally expand pinger requirements throughout the area and season where the GOM/BOF harbor porpoise distribution overlaps the distribution of New England and Mid-Atlantic gillnet fisheries. Figures 2-5 and 2-6 at the end of this section depict the management areas under Alternative 3 in both New England and the Mid-Atlantic.

New England (Figure 2-5)

- For all areas in the GOM (west and south of a line drawn from the shoreline of Maine at 68º 55' W longitude and 43º 30'N latitude and east along this latitude to the EEZ) and southern New England, pingers would be required from September 15 through May 31. The Northeast Closure Area (closed August 15 through September 13) would be retained and no pingers would be required east of that area where effort and takes are very low. All other existing seasonal closure areas and periods would also remain in effect, including the Cashes Ledge Closure Area (closed in February), as well as the Massachusetts Bay and Cape Cod South Closure Areas (both closed in March).

Mid-Atlantic (Figure 2-6)

- Pingers would be required for small and large mesh gillnets throughout the Waters off New Jersey (including the Mudhole Management Area) and Southern Mid-Atlantic Management Areas from January 1 through April 30. Seasonal closure periods and areas would remain in effect. These include the large and small mesh gillnet closure from February 15 through March 15 in the Mudhole Management Area, and two large mesh gillnet closures – one from February 15 through March 15 in the Southern Mid-Atlantic Management Area and the other from April 1 through April 20 in the Waters off New Jersey Management Area. Because pingers are effective on gillnets in New England without additional gear modifications, the current Mid-Atlantic gear modification requirements would be rescinded under this option.

The HPTRT brainstormed over a number of potential harbor porpoise take reduction strategies that included expanded pinger requirements. One alternative discussed by the HPTRT would expand existing pinger requirements throughout New England waters and into the Waters off New Jersey Management Area. Another option discussed included the expansion of a pinger area well beyond the existing Cape Cod South Management Area, south and east along Eastern Cape Cod. Additionally, a temporal expansion of the pinger requirements to an 11 month period (with a closure during the month of October) in the Mid-Coast Management Area was discussed due to the high bycatch rate and low compliance observed in that area in recent years.

Expansion of pingers over the entire New England area and period, however, was not fully discussed by the HPTRT. Although the efficacy of correctly used pingers in New England was not disputed, past experience shows that poor compliance results in increased harbor porpoise bycatch rates. Additionally, recently enhanced enforcement efforts show that the disincentive of enforcement quickly increases compliance. Therefore, because dockside enforcement of these measures would be possible, this alternative could ease enforcement efforts and improve

compliance, thus increasing the effectiveness of the HPTRP. Expanded pinger areas provide potential benefits over expanded closure periods by preventing potential increased economic effects, or by avoiding the shift of effort and bycatch into adjacent open areas. However, the option to expand pinger requirements into the Mid-Atlantic, even when the discussion was limited to the Waters off New Jersey, was not favorably received by HPTRT members. The effectiveness of pingers for reducing harbor porpoise bycatch in Mid-Atlantic waters has not been evaluated. However, limited testing has taken place in North Carolina on the effects of acoustic devices on bottlenose dolphins. The dolphins observed during recent studies reacted differently to pingers than harbor porpoises do in that their initial reactions are relatively small and the pingers do not appear to deter them from the vicinity of the nets (Cox et al., 2003). Rather, it is possible that pingers alert bottlenose dolphins to the presence of the nets. In a recent study involving bottlenose dolphin depredation in the Spanish mackerel gillnet fishery, a new type of acoustic deterrent device called the SaveWave was tested to determine its effects on bottlenose dolphins. While a very low amount of depredation was observed during the study, the results indicated that the SaveWave devices did not deter the dolphins from the nets. Rather, the devices appeared to alert dolphins to the presence of the net (the researchers observed increased echolocation in the presence of active SaveWave devices), which could help reduce entanglement risk but could also increase depredation as the devices did not seem to deter the dolphins away from the nets (Read et al., 2006).

**Figure 2-5: Alternative 3 - Expanded Seasonal Pinger Requirements in New England**

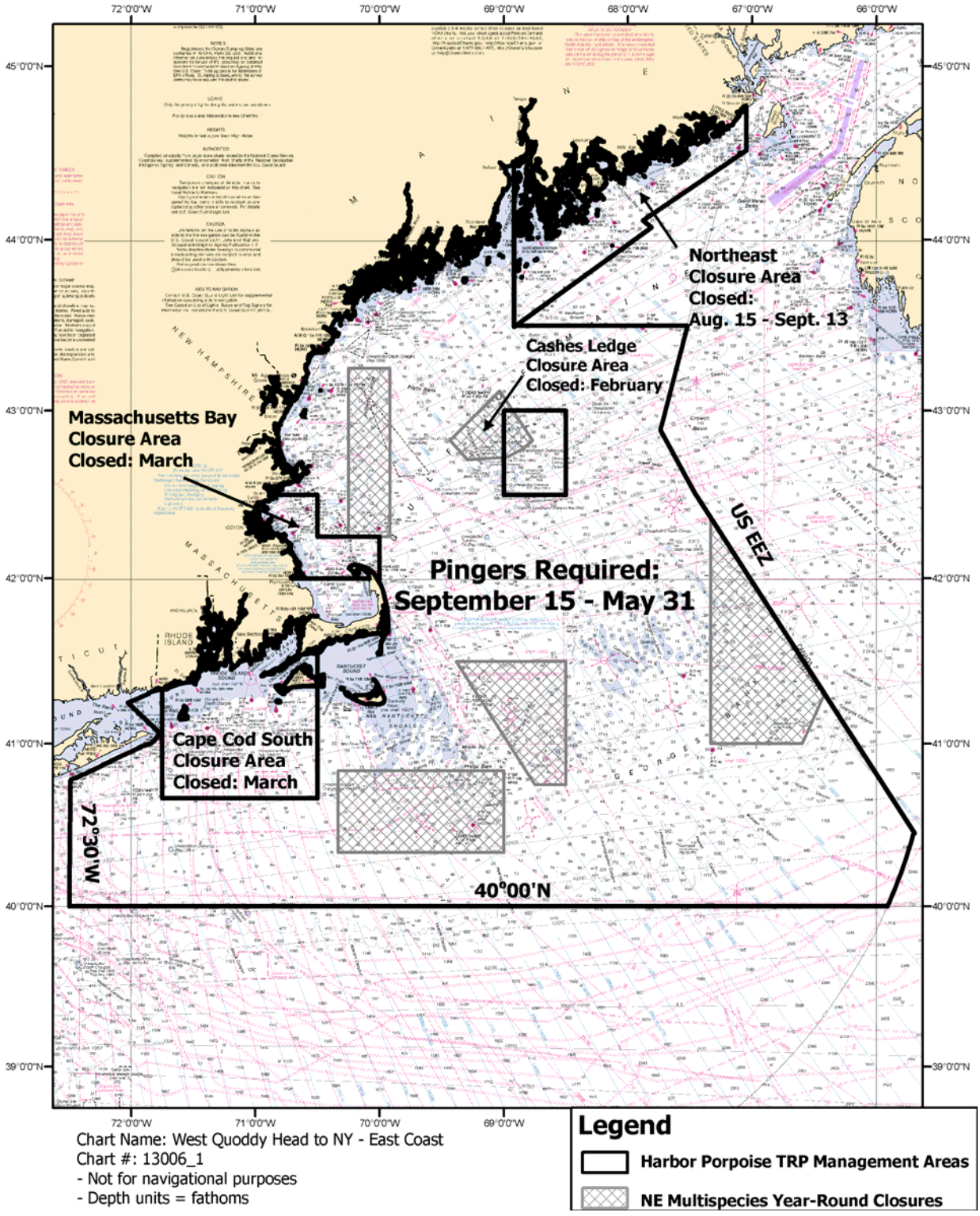


**Figure 2-6: Alternative 3 - Expanded Seasonal Pinger Requirements in the Mid-Atlantic**

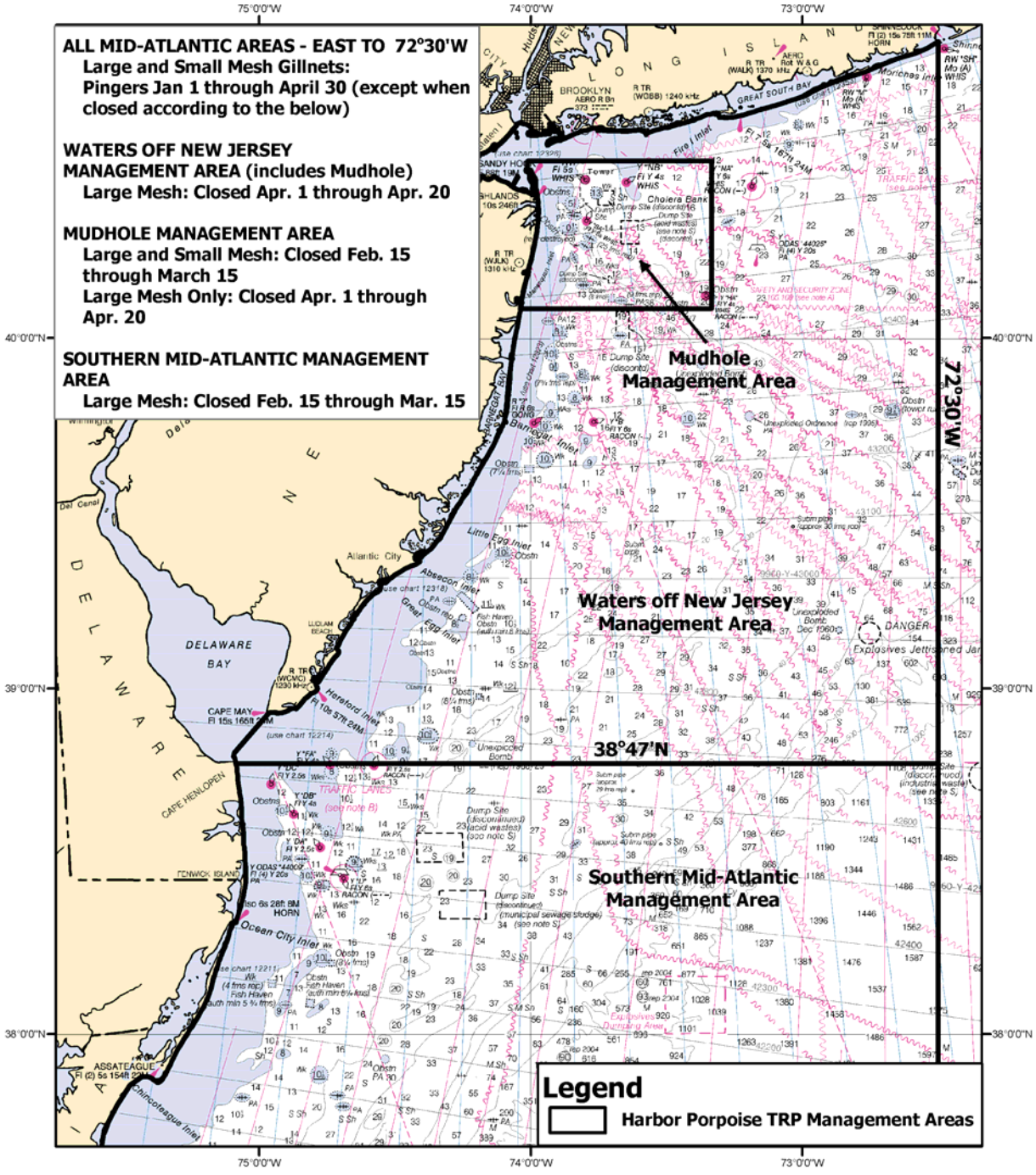



Chart Name: Cape Sable to Cape Hatteras
Chart #: 13003_1
- Not for navigational purposes
- Depth units = fathoms

- Note that the southern boundary of the Southern Mid-Atlantic Management Area is the NC/SC border (33°51'N)

### 2.2.4 Alternative 4: Preferred

Alternative 4 (Preferred) adopts many of the options that received consensus or broad support from the HPTRT. Figures 2-7, 2-8, and 2-9 at the end of this section depict the management areas under Alternative 4 (Preferred) in both New England and the Mid-Atlantic.

Because of the complexity of this alternative, the components are listed by area below, followed by a discussion of each component and the HPTRT's position on each component of this alternative.

New England

1. Expand pinger use requirement to include November in the Massachusetts Bay Management Area.
2. Expand the Massachusetts Bay Management Area by incorporating the small area between the Massachusetts Bay Management Area and the Multispecies Western GOM Closure Area by moving the current boundary along latitude line 42º 12' N slightly north to latitude line 42º 15'N, which corresponds with the southern boundary of the Multispecies Western GOM Closure Area.
3. Establish the Stellwagen Bank Management Area. Require pingers November through May.
4. Establish the Coastal Gulf of Maine Consequence Closure Area. If, after two consecutive years, the observed average bycatch rate in the Mid-Coast, Massachusetts Bay, and Stellwagen Bank Management Areas during the periods that pingers are required (September 15 through May 31 for the Mid-Coast Management Area, and November 1 through May 31 for the Stellwagen Bank and Massachusetts Bay Management Areas) exceeds the target bycatch rate of 0.031 harbor porpoise takes per observed metric tons of landings (takes/mtons), closure of the Coastal Gulf of Maine Consequence Area (Figure 2-8) would be required in October and November of each year until ZMRG is achieved or until NMFS and the HPTRT develop and establish new management measures. Outside of the consequence closure area and period, current pinger requirements of the three individual areas and the March closure in the Massachusetts Bay Management Area would be maintained.
5. Establish the Southern New England Management Area. This is a broad area south and east of Cape Cod, extending from the Rhode Island-Connecticut border around Long Island to 72º 30'W longitude, south to 40° 00'N latitude, east to 69º 30'W longitude, north to the southern boundary of the Multispecies Western GOM Closure Area at 42º 15'N latitude, west to 70º 00'W longitude, and south to the Cape Cod shoreline (see Figure 2-7). Pingers would be required from December through May, and the current Cape Cod South Management Area March closure would be maintained.
6. Within the Southern New England Management Area, establish the Cape Cod South Expansion Consequence Closure Area (includes the existing Cape Cod South Management Area, as well as an adjacent area to the south, shown in Figure 2-8) and establish the Eastern Cape Cod Consequence Closure Area. If, after two consecutive years, the observed average bycatch rate in the Southern New England Management Area during the period that pingers are required (December through May) exceeds the target

bycatch rate of 0.023 harbor porpoises per metric tons of landings (takes/mtons), closure of the Cape Cod South Expansion Consequence Area and the Eastern Cape Cod Consequence Area (Figure 2-8) will be required from February through April of each year until ZMRG is achieved or until NMFS and the HPTRT develop and establish new measures. Outside of the consequence closure areas and periods, the pinger requirements for the Southern New England Management Area would be maintained.

Mid-Atlantic

1. Establish the Mudhole South Management Area to the south and east of the existing Mudhole Management Area (see Figure 2-9) and rename the existing Mudhole Management Area to the Mudhole North Management Area. Like the existing Mudhole North Management Area, this area would be closed to large and small mesh gillnet gear from February 1 through March 15, and would include more restrictive large and small mesh gear requirements from January 1 until April 30, except when the Mudhole Management Area or Waters off New Jersey closures apply. The Mudhole North and South Management Areas large mesh gear restrictions include no more than 13 nets per string and a floatline length no longer than 3,900 ft (1,189 m). The small mesh gear restrictions include no more than 10 nets per string and a floatline length no longer than 3,000 ft (914 m). Note that the existing twine size, tie-down, net size, and net number per vessel requirements for large and small mesh gillnet gear in these areas would be maintained (see Section 2.2.1).
2. Modify tie-down requirement for large mesh gillnets in both the Waters off New Jersey and Southern Mid-Atlantic Management Areas from no more than every 15 ft (4.6 m) to no more than every 24 ft (7.3 m).
3. Modify borders within the Mid-Atlantic: Modify the exempted waters in Virginia from Chincoteague to Ship Shoal Inlet (currently landward of 37° 52'N, 75° 24.30'W to 37° 11.90'N, 75° 48.30'W) to the 72 COLREGS demarcation lines. Also, extend the northern boundary of the Waters off New Jersey Management Area (72° 30'W) north to the south coast of Long Island (at 40° 50.1'N) and remove the current northern boundary of the intersection of 40° 40'N.

A. NEW ENGLAND MANAGEMENT MEASURES (Figures 2-7 and 2-8)

A.1. Expand the pinger season to include November in the Massachusetts Bay Management Area (Figure 2-1 illustrates the current Massachusetts Bay Management Area and lists the management and closure requirements; Figure 2-7 illustrates the new boundaries and season proposed here for the Massachusetts Bay Management Area).

At the December 2007 HPTRT meeting, and again during the January 31, 2008 teleconference, the HPTRT reached full consensus on the expansion of the pinger season to include the month of November, extending pinger requirements from November through May, except for during the month of March when gillnets are prohibited. Currently, groundfish gillnet fishing is prohibited in the Massachusetts Bay Management Area from October through November under the Multispecies FMP Rolling Closure Area V restrictions (50 CFR 648.81). However,

modifications to this FMP are being considered that include possible exemptions to rolling closures. Two takes of harbor porpoises have been documented in gillnets in November in Massachusetts Bay between 1999 and 2006 (Palka et al., 2008a [Appendix A]). Given the low number of trips that occur and are observed during the fall Multispecies FMP rolling closure, this represents a fairly high bycatch rate (0.052 harbor porpoise/mtons landed) that, if the closure is lifted, could result in high harbor porpoise bycatch.

A. 2. Expand one of the boundaries of the Massachusetts Bay Management Area from 42° 12' N latitude to 42° 15' N latitude to meet the southern boundary of the Multispecies Western GOM Closure Area (Figure 2-7).

The states of Maine, Massachusetts, and New Hampshire submitted a suite of management measures for New England in a proposal for the HPTRT's January 2008 teleconference that included this boundary expansion (see proposal within Appendix F). Although effort and harbor porpoise takes in this area are low, inclusion of this area prevents effort displacement into the narrow strip of water and eliminates confusion with area boundaries. The overall state proposal received broad support from the HPTRT, and this specific component did not generate discussion, suggesting little, if any, opposition.

A. 3. Establish the Stellwagen Bank Management Area and require pingers from November through May (consistent with the Massachusetts Bay Management Area).

Figure 2-1 shows an unregulated rectangle between the Massachusetts Bay Management Area and the Western GOM Closure Area under current management measures. Figure 2-7 illustrates the inclusion of this rectangle within the HPTRP as the Stellwagen Bank Management Area. NMFS first proposed expanding the Massachusetts Bay Management Area requirements into this area (termed the "X Box" at the December 2007 meeting) in the discussion paper prepared for the December 2007 HPTRT meeting (Appendix E). The necessity for the addition of this specific management area to the HPTRP achieved full consensus at the December 2007 meeting.

At the December 2007 meeting, the HPTRT reached consensus on a set of management requirements for this area including pingers in December and January and a February gillnet closure. The states received broad support for their subsequent proposal during the January 2008 teleconference to require pingers from December through May instead of a closure in this currently unregulated area. Because this area is essentially an offshore extension of the Massachusetts Bay Management Area, under this alternative NMFS is proposing to require pingers from November through May. Although the Massachusetts Bay Management Area is closed to gillnet fishing in March, due to other beneficial GOM measures adopted from the states' proposal and the HPTRT's consensus on a proposal that did not include the closure, NMFS is not proposing a March closure for the Stellwagen Bank Management Area.

A. 4. Establish the Coastal Gulf of Maine Consequence Closure Area.

Figure 2-8 illustrates the proposed Coastal Gulf of Maine Consequence Closure Area, a shaded area overlying the Stellwagen Bank Management Area and parts of the Massachusetts Bay and Mid-Coast Management Areas. Gillnet fishermen in this area would operate under the

requirements of the seasonal pinger and closure requirements of the relevant management areas (Mid-Coast, Massachusetts Bay, and Stellwagen Bank Management Areas). If the harbor porpoise bycatch rate, averaged over the three areas and the most current two management years, exceed 0.031 harbor porpoise takes per observed metric tons of landings (takes/mtons), the Coastal Gulf of Maine Consequence Area would be closed in October and November of each year. The October 1 through November 30 closure would remain in place until ZMRG is achieved or until the HPTRT and NMFS develop and establish new management measures. Outside of the closure period or area, pinger requirements for the three individual areas and the March closure in the Massachusetts Bay Management Area would be maintained.

As discussed in Section 1, compliance with the pinger measures eroded quickly after the HPTRP regulations were first implemented. Outreach, along with the "incentive" of an increased enforcement presence in the management areas, rapidly improved compliance. However, compliance has never been observed above 80% in New England waters. Participants on the HPTRT agreed that the development of a plan with serious consequences for non-compliance was required to ensure that pingers would be used and maintained by New England gillnet fishermen. Rather than punitively implementing immediate closures due to past poor compliance with the pinger requirements, the proposed measures provide gillnet fishermen with an opportunity to achieve compliance with the pinger requirements, with closures required only as a consequence of future poor compliance. Therefore, at the December 2007 meeting, the HPTRT broadly supported the establishment of "consequence" closure areas. Note that these ideas were discussed in detail only for the Southern New England Area (see explanation below).

Although full consensus was reached on the concept of consequence areas during the December 2007 meeting, there were many unresolved issues relative to new management measures considered for the GOM. The proposal developed by the states of Maine, New Hampshire and Massachusetts for the HPTRT's January 2008 teleconference proposed measures for the GOM consistent with those previously accepted by the HPTRT for Southern New England during the December 2007 meeting. Full consensus was reached on the establishment of one consequence area that related to observed bycatch rates in three management areas: the Massachusetts Bay, Stellwagen Bank, and Mid-Coast Management Areas. This Coastal Gulf of Maine Consequence Closure Area was accepted without contention.

The HPTRT discussed two possible metrics for a closure trigger: compliance estimates and harbor porpoise bycatch rate estimates. There was broad support for use of target harbor porpoise bycatch rates based on the rate previously observed for hauls with the proper number of pingers deployed. Additionally, there was broad support for using two years of data and developing two regionally distinct target bycatch rates, one for the GOM management areas and another for southern New England. Different bycatch rates can reflect the distribution and abundance of harbor porpoises rather than ineffectiveness of pingers or non-compliance in a particular area.

According to Palka and Orphanides (2008a), the bycatch rate observed on gillnet hauls during January 1, 1999, to May 31, 2007, in the three GOM Management Areas (Mid-Coast, Stellwagen Bank, and Massachusetts Bay) using the correct number of pingers is 0.031 harbor porpoise

takes/mtons of landings, with an annual range of 0 to 0.07 takes/mtons of landings (Appendix G).

Although the target bycatch rates reflect observations of vessels with the correct number of pingers, for most of the observed hauls the operational status of the pingers was not evaluated, and higher bycatch rates in "compliant" hauls in some years may have been due to inoperable pingers. A pinger tester program was initiated in 2003, however to date results are available for only 69 gillnet strings in which 813 pingers were successfully tested (Palka et al., 2008b) (Appendix D). Three hundred and forty six (43%) pingers were audible by ear and thus not tested; 109 (13%) were not audible by ear and were not tested; 307 (38%) were not audible by ear but testing indicated they were working properly; and 51 (6%) were not audible by ear and determined by testing to be not functional. Over all years, 80 to 93% of the pingers were working; although during 2003, when pinger compliance was low, only 36% of the tested pingers were working.

NMFS believes that fishermen motivated by the consequence closure areas to use the correct number of functioning pingers can keep bycatch rates near zero, well below the target bycatch rates proposed here. For the GOM management areas, the bycatch rate of compliant vessels has been 0.00 for 4.5 of the 8.5 years since pingers have been required and for which observer data were available for evaluation (see Appendix G).

However, although the HPTRT supported the concept of target bycatch rates based on observations of compliant hauls, some HPTRT members expressed concern about the ability of harvesters to maintain these rates. These members suggested a higher target bycatch rate be set, or that a phased approach be developed that would allow a higher bycatch rate in the first year. Additionally, they expressed concern that a few careless gillnet fishermen could cause closures that would affect broad areas. However, other HPTRT members pointed out that the expressed purpose of the consequence areas was to provide incentive for each gillnet fisherman to come into compliance with pinger requirements that have been in place in some areas for ten years. Although immediate closures would provide greater assurances, these HPTRT members accepted the provision that would allow gillnet fishermen another opportunity to show that pinger requirements can substantially reduce harbor porpoise bycatch.

In the end, consensus was not reached on the selected target bycatch rates. Some HPTRT members remained concerned that fishermen would have insufficient time to prepare for an immediate bycatch target rate that they believe is aggressive. To address this concern, NMFS and New England state participants from the HPTRT will continue outreach and enforcement operations to ensure gillnet fishermen understand the current and proposed requirements of the HPTRP, and if the Alternative 4 (Preferred) is adopted, the consequences of non-compliance. This will provide gillnet fishermen with the opportunity to come into compliance immediately.

Additionally, no consensus was reached on the period of a closure resulting from consequence closures. For marine mammal stocks with direct human-caused mortality which exceeds the stock's PBR, the MMPA requires a reduction in incidental take or serious injury to below PBR. The long-term goal, however, is to reduce take levels to insignificant levels that approach ZMRG, which for harbor porpoises is 61 animals. Because ZMRG is the actual conservation

goal of the MMPA, Alternative 4 (Preferred) proposes implementing the closures until ZMRG is reached or until NMFS and the HPTRT review the effectiveness of the modifications to the HPTRP and develop revisions as they deem necessary.

A. 5. Establish Southern New England Management Area. Figure 2-1 illustrates the existing Cape Cod South Management Area. As shown in Figure 2-7, this area is encompassed within a broad area south of Cape Cod and along Cape Cod's east coast, which will be the Southern New England Management Area. Pingers will be required in the Southern New England Management Area from December through May, and the March closure in the Cape Cod South Management Area will be maintained.

The HPTRT reached full consensus on the creation of a larger area in which pingers would be required from December through May, with the general dimensions described and adopted at the December 2007 meeting. This larger area includes all waters in which harbor porpoise bycatch was observed, as well as sufficient surrounding waters to prevent a shift in effort to nearby areas where takes will likely occur. The chart illustrating exact dimensions of the Southern New England Management Area in the states' proposal prepared for the January 2008 teleconference provoked no discussion, suggesting continued consensus; therefore, the dimensions are included in Figure 2-7.

The HPTRT considered, but rejected, the possibility of closing the entire Southern New England Management Area to gillnet fishing in March, as required in the current Cape Cod South Management Area. Additionally, the HPTRT considered adding an additional closure area in the shape of a box south of the Cape Cod South Management Area and closing this new box to gillnet fishing from February 1 to April 30. In the end, they decided to identify this new box, but to include it as a consequence closure area (see below).

A. 6. Establish the Cape Cod South Expansion Consequence Closure Area (includes the existing Cape Cod South Management Area, as well as adjacent waters to its south, shown in Figure 2-8) and the Eastern Cape Cod Consequence Closure Area.

Like the consequence area established for the GOM, these areas would not be closed unless, after the most current two years, the observed average harbor porpoise bycatch rate in the Southern New England Management Area during the period that pingers are required (December through May) exceeds the target bycatch rate of 0.023 harbor porpoises per metric tons of landings (takes/mtons). If the target rate is exceeded as described, both the Cape Cod South Expansion Consequence Closure Area and the Eastern Cape Cod Consequence Closure Area would be closed from February through April of each year until ZMRG is achieved or until NMFS and the HPTRT develop and establish new management measures. Outside of the consequence closure areas and periods, the current pinger requirements for the Southern New England Management Area would be maintained.

As discussed above, the HPTRT reached full consensus on the concept of a consequence closure area, and specifically, the Cape Cod South Expansion Consequence Closure Area, at the December 2007 meeting. The HPTRT initially also reached consensus on a target bycatch rate of 0.03, which is the target bycatch rate for 90% pinger compliance. Further analysis indicated a

bycatch rate reflecting compliance with the pinger requirements would be 0.023 harbor porpoises per mtons of landings (Appendix G). While there was support for a Southern New England Management Area target bycatch rate of 0.023, as discussed above, some HPTRT members were concerned with the immediate implementation of an aggressive bycatch rate. Therefore, no consensus was reached for a target rate for the Southern New England Management Area.

Consensus was reached on the Cape Cod South Expansion Consequence Closure Area and the creation of a consequence closure area on the east side of Cape Cod, to provide incentive for fishermen in that area to comply with new pinger requirements. The resulting Eastern Cape Cod Consequence Closure Area, initially discussed during the January 2008 teleconference, received consensus support from all of the HPTRT members that commented on follow up materials provided after the teleconference.

As discussed above, no consensus was reached on the length of time that the consequence closure areas should remain closed, if closures are triggered.

**Figure 2-7: Alternative 4 (Preferred) - New England Harbor Porpoise Management Areas for Gillnets (management measures depicted before target bycatch rate exceeded)**

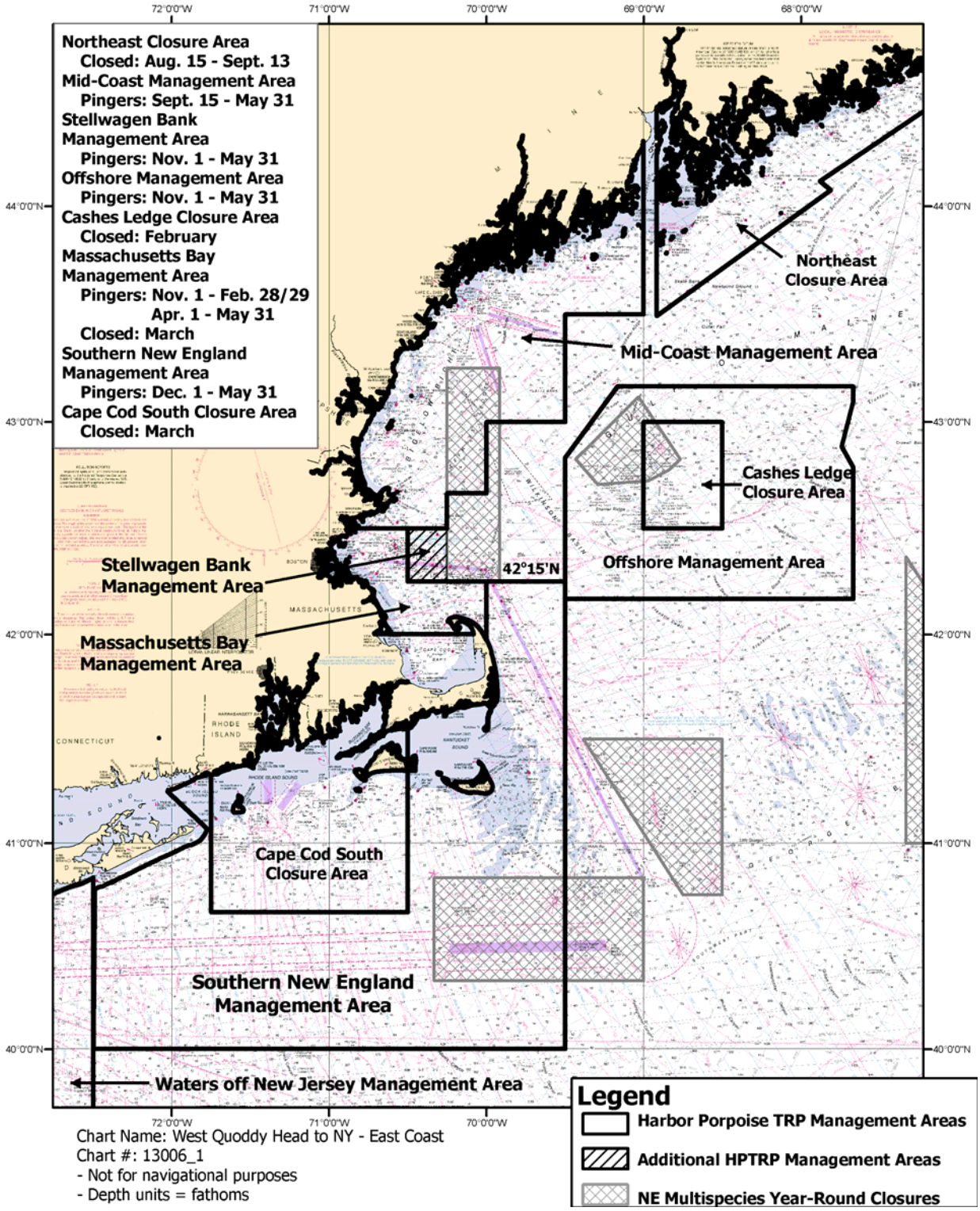
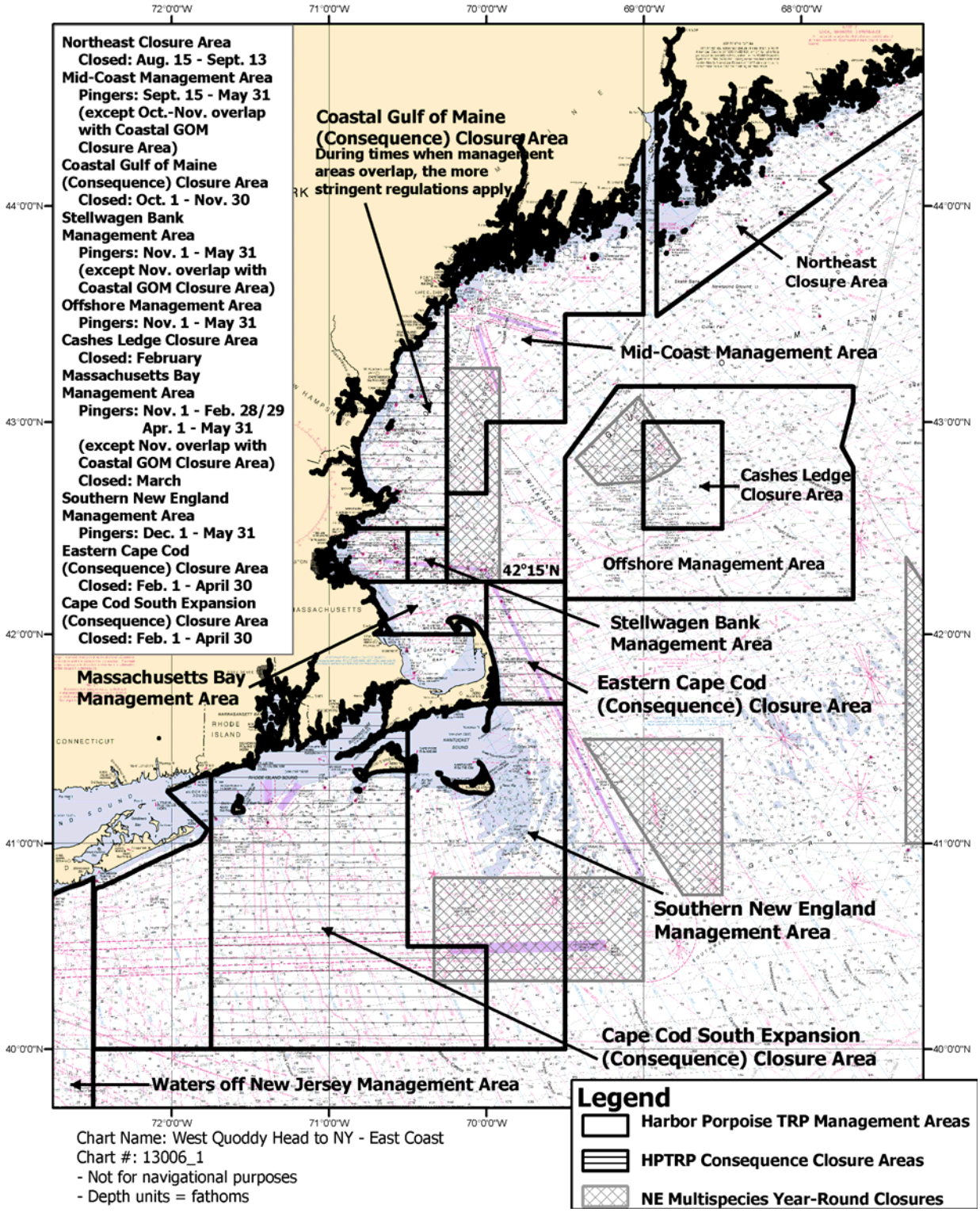


**Figure 2-8: Alternative 4 (Preferred) - New England Harbor Porpoise Management Areas for Gillnets (management measures depicted after target bycatch rate exceeded)**



B. MID-ATLANTIC MANAGEMENT MEASURES (Figure 2-9)

B. 1. Establish the Mudhole South Management Area (Figure 2-9) and rename the existing Mudhole Management Area as the Mudhole North Management Area.

Since the implementation of the HPTRP in 1999, harbor porpoise takes in the Mid-Atlantic have occurred primarily in the Waters off New Jersey Management Area, particularly in the existing Mudhole Management Area and the waters south and east of this area. Alternatives considered by the HPTRT to reduce these takes included: 1) expanding the existing Mudhole Management Area, 2) shifting the existing Mudhole Management Area south, 3) requiring pingers in the Waters off New Jersey Management Area, 4) shifting the existing Mudhole Management Area east, or 5) creating a second separate area south and east of the existing Mudhole Management Area. The final option, development of a new area south and east of the existing Mudhole Management Area, achieved full consensus of the HPTRT at the December 2007 meeting. The HPTRT agreed to establish a complete closure of this area to commercial gillnet fisheries from February 1 to March 15. The preferred alternative proposed in this EA applies the Mudhole North Management Area large and small mesh gear restrictions from January 1 through April 30 (except when closures apply) to the proposed Mudhole South Management Area. These gear restrictions include no more than 13 nets per string and a floatline length of no longer than 3,900 ft (1,189 m) for large mesh nets, and no more than 10 nets per string with a floatline length no longer than 3,000 ft (914 m) for small mesh nets. The twine size, tie-down, net size, and net number per vessel requirements for large and small mesh gillnet gear in these areas would be maintained (see Section 2.2.1).

B. 2. Modify tie-down requirement for large mesh gillnets in both the Waters off New Jersey and Southern Mid-Atlantic Management Areas from no more than 15 ft (4.6 m) to no more than 24 ft (7.3 m).

This management measure achieved full consensus of the HPTRT during the December 2007 meeting. A tie-down uses twine between the floatline and the lead line to create a pocket or bag within the gillnet to keep monkfish alive longer, which is necessary due to the long set times of monkfish gillnets. When finalized through the 1998 HPTRP regulations, tie-downs were required not more than every 15 ft (4.6 m) along the floatline of large mesh gillnets. Current practice favors use of tie-downs every 24 ft (7.3 m). Because this change is not likely to significantly affect the way gillnets fish or their profile in the water column, it is unlikely to increase harbor porpoise takes. Therefore, the HPTRT agreed to support this modification to the regulations.

**Figure 2-9: Alternative 4 (Preferred) - Mid-Atlantic Harbor Porpoise Management Areas for Gillnets**

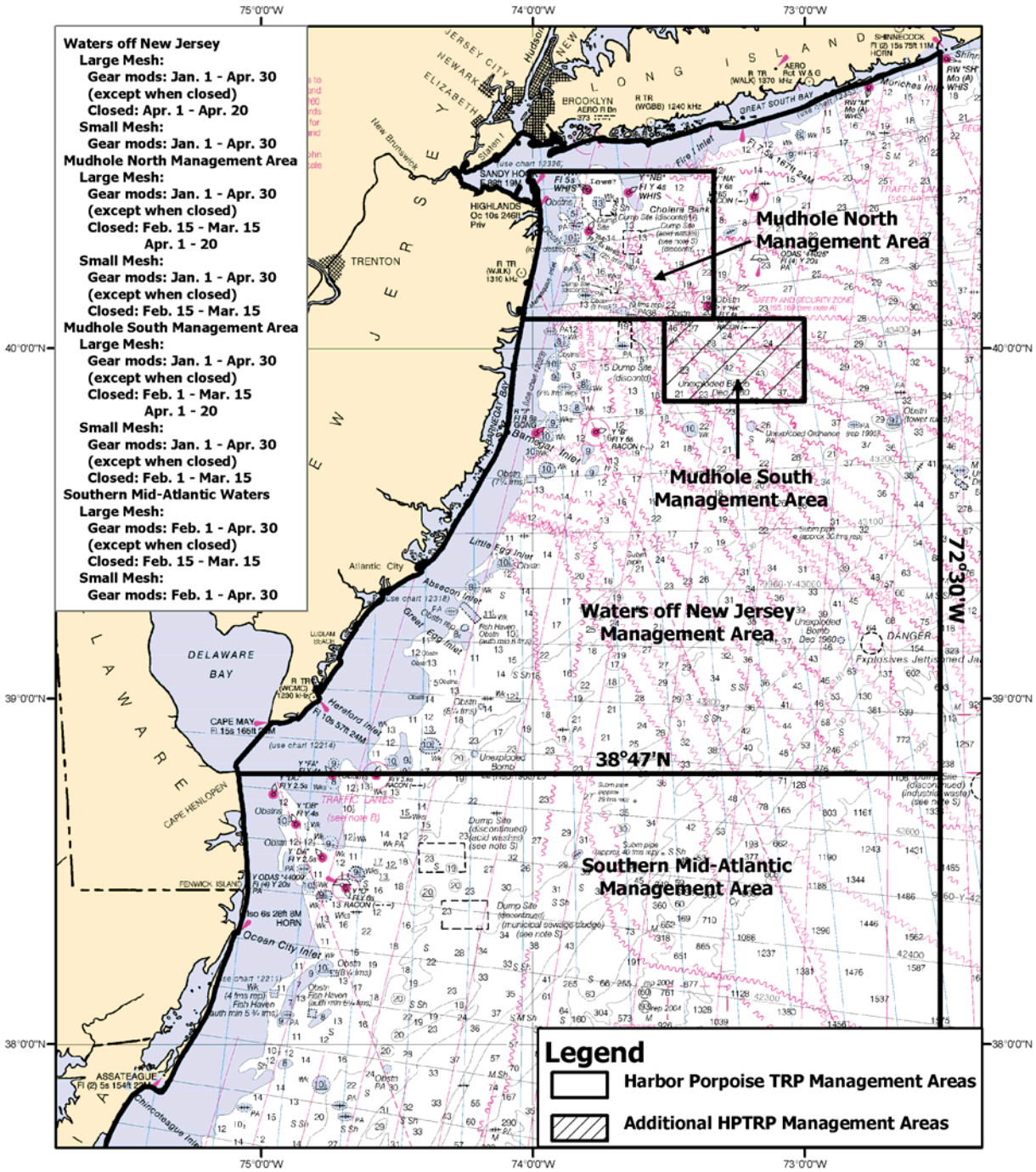



Chart Name: Cape Sable to Cape Hatteras
Chart #: 13003_1
- Not for navigational purposes
- Depth units = fathoms

- Note that the southern boundary of the Southern Mid-Atlantic Management Area is the NC/SC border (33°51'N)

### 2.2.5 Alternative 5: Modified Alternative 4

This alternative includes all of the management actions identified in the Alternative 4 (Preferred), as well as three additional changes: elimination of the Offshore Management Area and associated pinger requirements, elimination of the closure period in the Southern Mid-Atlantic Management Area, and incorporation of the Multispecies FMP Western GOM Closure Area into the MMPA measures implementing the HPTRP. Figures 2-10, 2-11, and 2-12 at the end of this section depict the management areas under Alternative 5 in both New England and the Mid-Atlantic.

- Eliminate Offshore Management Area.

At the December 2007 meeting, the HPTRT made a consensus recommendation to eliminate the Offshore Management Area in which pingers are currently required from November 1 to May 31. Outside of the Cashes Ledge Closure Area, which would be retained, gillnet fishing effort and harbor porpoise takes in these offshore waters have been very low. Prior to the implementation of the HPTRP, the bycatch rate in the Offshore Closure Area was high. Between 1989 and 1998, the fall bycatch rate was 0.0102 takes/mtons, and the winter bycatch rate was 0.1172 takes/mtons (Orphanides and Palka, 2008) (see Appendix H). However, since the implementation of the HPTRP, despite the fact that only 44% of all observed effort had pingers, no harbor porpoise takes were observed and gillnet effort has been relatively low. Using these recent observations to establish the minimum bycatch estimate, and the pre-HPTRP harbor porpoise bycatch rate to establish the maximum, under the 2005 and 2006 gillnet effort level, a range of 0 to 32 harbor porpoises could be taken by serious injury or mortality annually in the Offshore Management Area (Orphanides and Palka, 2008).

When the New England States proposed a comprehensive suite of alternatives for the GOM fisheries, consistent with December 2007 concurrence recommendations from the HPTRT for Southern New England, they retained the Offshore Management Area pinger requirements. The states' proposal (Appendix F) was broadly supported by the HPTRT at the January 31, 2008 teleconference and forms the basis for retaining the Offshore Management Area under Alternative 4 (Preferred).

- Eliminate the Southern Mid-Atlantic Management Area large mesh gillnet closure period (February 15 through March 15).

During the December 2007 and January 2008 HPTRT meeting discussions, a representative for striped bass gillnet fishermen in Virginia requested a state waters exemption to the February 15 – March 15 large mesh gillnet closure in the Southern Mid-Atlantic Management Area. The representative indicated that the closure period impacted the brief window of opportunity afforded to the restricted striped sea bass ocean fishery. The Virginia Marine Resources Commission (VMRC) submitted a proposal to NMFS and the HPTRT prior to the January 2008 teleconference requesting a change in the definition of large mesh gillnet gear for the Virginia striped bass fishery during the closure period to increase the restricted mesh size to mesh greater than 8 inches (20 cm). This one-inch increase would allow fishing, while reducing the catch of undersized striped bass. According to the proposal submitted by VMRC, 38 fishermen have ocean striped bass quotas, and only 17 of those fishermen harvested striped bass during the

closure period in 2007. This suggests that effort is low and the state is closely managing the fishery. However, even while under state management, large mesh gillnet fishermen have been operating in Virginia waters during the February 15 – March 15 closure period despite HPTRP regulations in effect since 1999.

Five of the eight HPTRT members that commented on the Virginia proposal supported the proposal, in some cases with ambivalence. Three HPTRT members opposed the proposed definition change, citing NMFS' stated objective in the 1998 EA prepared for the HPTRP (NMFS, 1998), to base regulatory measures on the characteristics of the gillnet fisheries that relate to harbor porpoise bycatch, rather than to base the regulations on target fisheries. The EA states that it is the nature of the gear and how the gear is employed that determines whether harbor porpoises are entangled. Additionally, because the intended target species is not always the actual species landed, regulations based on sub-fisheries become very difficult to enforce. NMFS remains opposed to modifying the regulations implementing the HPTRP to provide special definitions or exemptions for individual sub-fisheries.

As an alternative, NMFS analyzed the effect of eliminating the entire Southern Mid-Atlantic Management Area closure period on achieving PBR. This alternative was not discussed with the HPTRT. The large mesh closure in the Southern Mid-Atlantic Management Area was initially implemented, in part, due to concerns that large mesh gillnet fishing effort would continue to increase as the unregulated monkfish fishery developed. However, the monkfish fishery has since been managed under a FMP, and effort has been restrained. In the Mid-Atlantic, the monkfish fishery now operates primarily in the Waters off New Jersey Management Area.

Since 1999, four harbor porpoise takes have been observed in large mesh gillnets targeting either monkfish or striped bass (Palka et al., 2008a) (see Appendix A). All of these takes occurred in hauls that, like 79% of the observed large mesh hauls in the Southern Mid-Atlantic, were in some way out of compliance with the gear restrictions or closure periods in the HPTRP. The apparent disregard for the existing HPTRP requirements, as well as the potential for changes in the large mesh gillnet fisheries' distribution and management in the Southern Mid-Atlantic, where porpoise takes have been documented, support NMFS' preference to retain the Southern Mid-Atlantic Management Area closure period.

- Incorporate the Multispecies FMP Western GOM Closure Area into the HPTRP regulations.

At the December 2007 meeting, the HPTRT made a consensus recommendation to codify the Multispecies Western GOM year-round closure within the MMPA regulations implementing the HPTRP. Takes documented along and just over the western border of the Closed Area between January 1999 and May 2007 (Appendix E) illustrate the potential importance of the closed area to harbor porpoise protection. Some HPTRT members felt that this closure should be made permanent under the HPTRP for the protection of harbor porpoises in the event the New England Fishery Management Council considered re-opening the area to gillnet fishing under the Multispecies FMP. However, no modifications to the Western GOM Closed Area are being considered under the ongoing deliberations regarding the New England Multispecies FMP. NMFS believes that no additional legal protection (such as a higher potential penalty) is afforded by incorporation of the Closure under the HPTRP regulations; therefore, implementation of this consensus recommendation is not a preferred alternative at this time. In addition, even if the

Western GOM Closed Area was reopened, about half of it is still in the Mid-Coast Management Area so gillnets in this region would still have to follow the HPTRP regulations for the Mid-Coast Management Area.

**Figure 2-10: Alternative 5 - Modified Alternative 4 in New England (management measures depicted before target bycatch rate exceeded)**

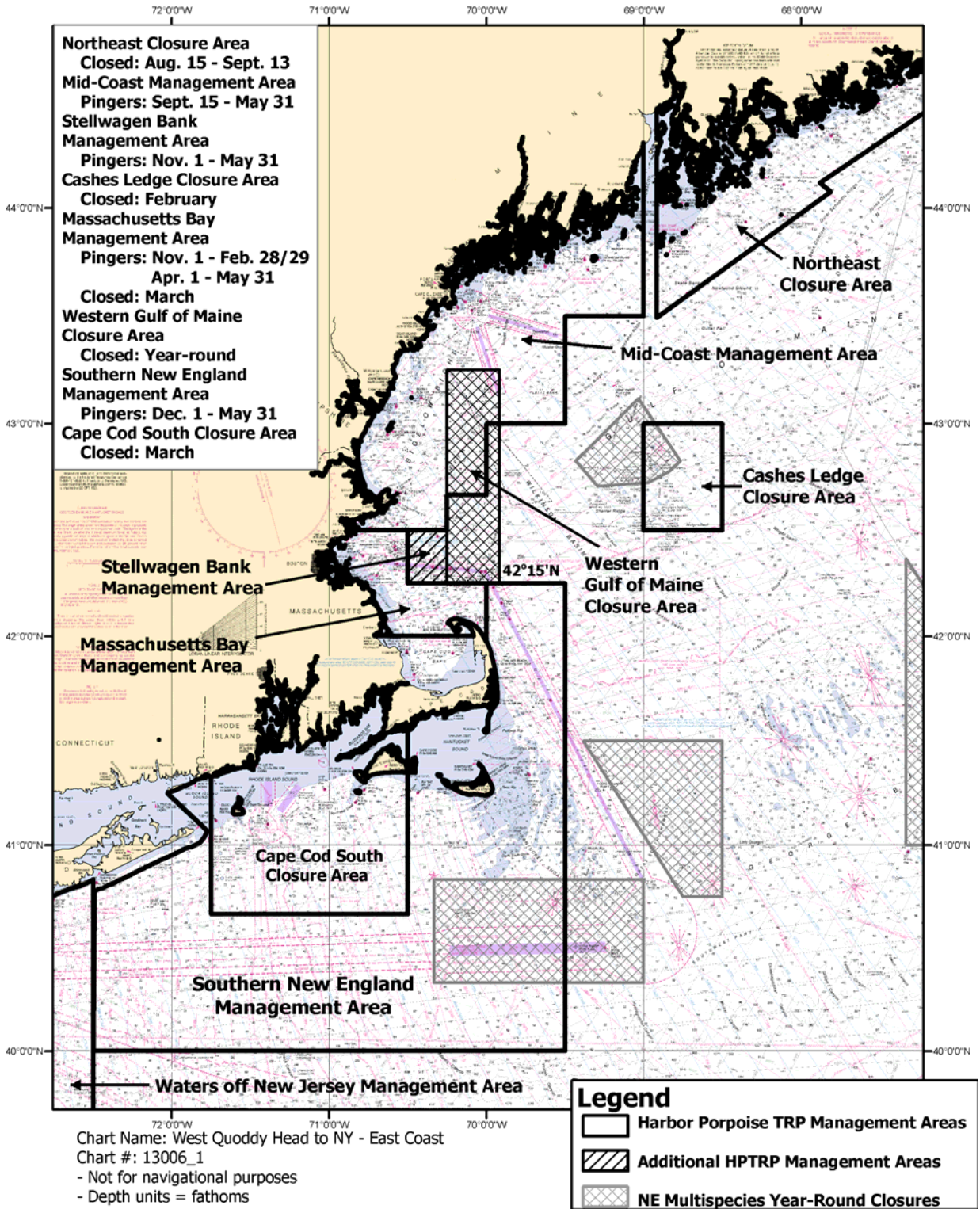


**Figure 2-11: Alternative 5 - Modified Alternative 4 in New England (management measures depicted after target bycatch rate exceeded)**

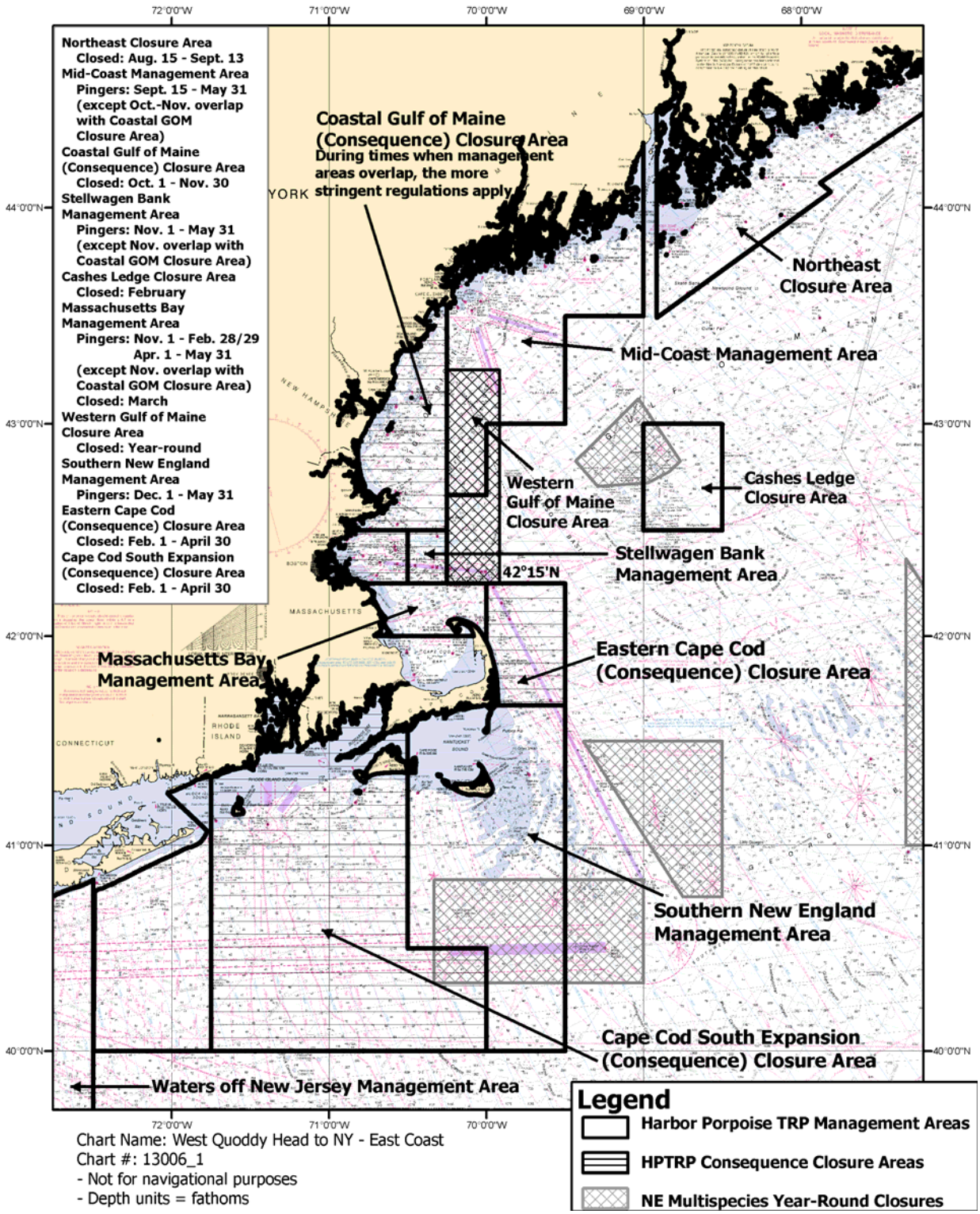


**Figure 2-12: Alternative 5 - Modified Alternative 4 in the Mid-Atlantic**

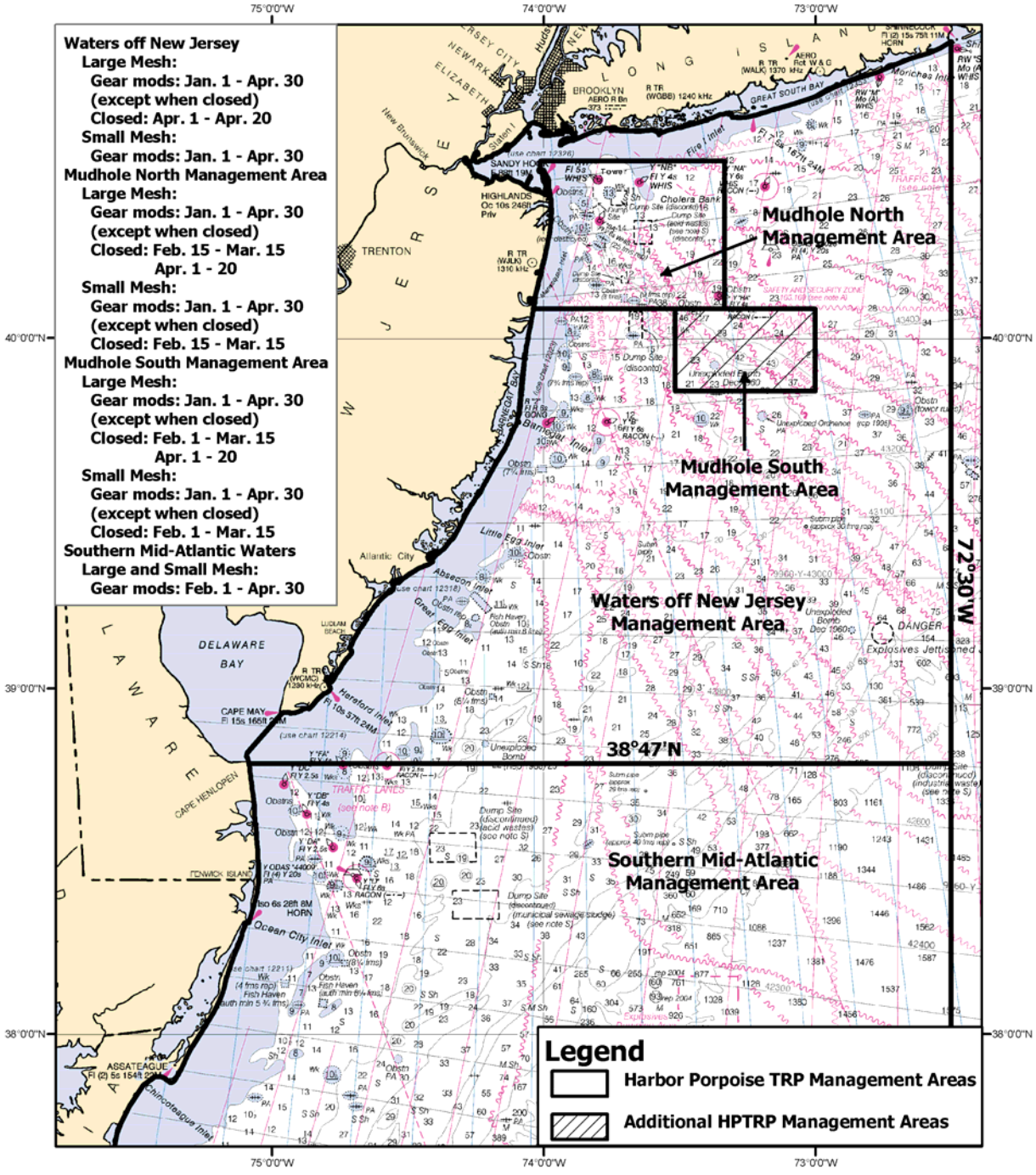



Chart Name: Cape Sable to Cape Hatteras
Chart #: 13003_1
- Not for navigational purposes
- Depth units = fathoms

- Note that the southern boundary of the Southern Mid-Atlantic Management Area is the NC/SC border (33°51'N)

# 3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

## 3.1 Physical Environment

The management measures considered in this assessment affect the GOM/BOF stock of harbor porpoises, which occur in U.S. waters from the northern GOM south to the North Carolina/South Carolina border (Waring et al., 2007a). Harbor porpoises are found from the coastline to deep waters (Westgate et al., 1998), although they occur primarily over the continental shelf. Generally, the measures evaluated in this EA refer to New England and Mid-Atlantic waters. For management purposes, the HPTRP divides the New England and Mid-Atlantic fisheries using the 72º 30' W longitude line as a boundary. Although gillnet fishermen from New England and the Mid-Atlantic states cross this line, it is a familiar demarcation to them, first established in 1993 to regulate mesh exemptions in the summer flounder FMP (50 CFR 648.104 (b)(1)) and to identify the Mid-Atlantic Exemption Area in the Multispecies FMP (50 CFR 648.80 (c) (5)). Biogeographically, however, and for the purposes of describing the physical environment, these waters are broadly separated into the GOM and Mid-Atlantic Bight. Descriptions of the physical environment given in this section are paraphrased largely from the report by Stevenson et al. (2004) entitled, "Characterization of the fishing practices and marine benthic ecosystems of the northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential habitat."

The waters of the GOM represent the northern boundary of harbor porpoise habitat in U.S. waters. The GOM is bordered on the east, north and west by the coasts of Nova Scotia, New Brunswick, and the New England states, respectively. To the south, the GOM is open to the North Atlantic Ocean. The interior of the GOM is characterized by deep basins, separated by irregular topography that includes a number of shallow ridges, ledges, and banks. The distribution of benthic species and assemblages of species in the GOM are strongly related to the bottom type and the properties of the water overlying the bottom.

South of Massachusetts, the Mid-Atlantic Bight extends to Cape Hatteras, North Carolina. The Mid-Atlantic area is influenced by large estuaries, including the Chesapeake Bay (the largest estuary in the United States), Narragansett Bay, Long Island Sound, Hudson River, Delaware Bay, and the almost continuous band of estuaries behind the barrier beaches from New York to Virginia. The southern edge of the region includes the estuarine complex of Currituck, Albermarle, and Pamlico Sounds, a 2,500 square mile system of large interconnecting sounds behind the fringing islands of the Outer Banks of North Carolina.

Offshore of the coast, the shelf area along the Mid-Atlantic Bight averages about 100 km (60 mi) in width, reaching a maximum of 150 km (30 mi) near Georges Bank, off New England, and a minimum of 50 km (30 mi) offshore of Cape Hatteras. The shelf is characterized by depths ranging from a few meters to approximately 60 m (198 ft), with a variety of bottom habitat types. The continental slope at the offshore edge of the shelf generally has smooth mud bottoms in water depths of 100-200 m (328-656 ft). Current speeds are strongest at the narrowest part of the shelf, where wind-driven current variability is highest. Water temperatures vary greatly in the Mid-Atlantic by season, causing the changes in distribution of harbor porpoises, their prey, and other marine species.

South of Cape Hatteras, North Carolina, the warm Gulf Stream Current originating in the Caribbean, flows along the eastern coastline until it is deflected by the Cape, pushing the current further offshore as it continues north until it merges with the Labrador Current. The physiographic and hydrographic characteristics of Cape Hatteras and associated proximity of the Gulf Stream to the shore causes the major climactic and resultant zoogeographic faunal change south of Hatteras. The seasonal changes in the Gulf Stream's distance from the coast in winter months influences the occasional occurrence of harbor porpoises in this southern extent of their range.

## 3.2 Biological Environment

Marine waters from Maine through North Carolina provide habitat to a diversity of aquatic organisms, including federally managed and commercially important fish species, endangered and threatened marine animals, and additional protected marine mammals.

### 3.2.1 Essential Fish Habitat, Habitat Areas of Particular Concern, and Critical Habitat

As discussed above, harbor porpoises off the United States are found primarily over the continental shelf, but may occur over deep waters as well. These nearshore and offshore waters represent Essential Fish Habitat (EFH) for 67 fish species. These species include American plaice (*Hippoglossoides platessoides*), Atlantic halibut (*Hippoglossus hippoglossus*), Atlantic herring (*Clupea harengus*), Atlantic salmon (*Salmo salar*), Atlantic sea scallop (*Placopecten magellanicus*), haddock (*Melanogrammus aeglefinus*), monkfish (goose-fish) (*Lophius americanus*), ocean pout (*Macrozoarces americanus*), offshore hake (*Merluccius albidus*), pollock (*Pollachius virens*), red hake (*Urophycis chuss*), redfish (*Sebastes* spp.), white hake (*Urophycis tenuis*), whiting (silver hake) (*Merluccius bilinearis*), window- pane flounder (*Scophthalmus aquosus*), winter flounder (*Pleuronectes americanus*), witch flounder (*Glyptocephalus cynoglossus*), yellowtail flounder (*Pleuronectes ferruginea*), seven skate species (barndoor [*Dipturus laevis*], clearnose [*Raja eglanteria*], little [*Leucoraja erinacea*], rosette *[Leucoraja garmani*], smooth [*Malacoraja senta*], thorny [*Amblyraja radiata*], and winter [*Leucoraja ocellata*] skates), deep-sea red crab (*Chaceon quinquedens*), Atlantic mackerel (*Scomber scombrus*), black sea bass (*Centropristis striata*), bluefish (*Pomatomus saltatrix*), butterfish (*Peprilus triacanthus*), *Illex* squid (*Illex illecebrosus*), *Loligo* squid (*Loligo pealei*), ocean quahog (*Artica islandica*), scup (*Stenotomus chrysops*), spiny dogfish (*Squalus acanthias*), summer flounder (*Paralichthys dentatus*), surf clam (*Spisula solidissima*), tilefish (*Lopholatilus chamaeleonticeps*), albacore tuna (*Thunnus alalunga*), Atlantic angel shark (*Squantina dumerili*), Atlantic bigeye tuna (*Thunnus obesus*), Atlantic bluefin tuna (*Thunnus thynnus*), Atlantic sharpnose (*Rhizoprionodon terraenovae*), Atlantic skipjack (*Katsuwonus pelamis*), Atlantic swordfish (*Xiphias gladius*), Atlantic yellowfin tuna (*Thunnus albacares*), basking shark (*Cetorhinus maximus*), blue marlin (*Makaira nigricans*), blue shark (*Prionace glauca*), dusky shark (*Carcharhinus obscurus*), longfin mako (*Isurus paucus*), porbeagle (*Lamna nasus*), sand tiger shark (*Carcharias taurus*), sandbar shark (*Carcharhinus plumbeus*), scalloped hammerhead (*Sphyrna lewini*), shortfin mako (*Isurus oxyrinchus*), silky shark (*Carcharhinus falciformis*), thresher shark (*Alopias vulpinus*), tiger shark (*Galeocerdo cuvieri*), white marlin (*Tetrapturus albidus*), white shark (*Carcharodon carcharias*). South Atlantic species include red drum

(*Sciaenops ocellatus*), Spanish mackerel (*Scomberomorus maculatus*), cobia (*Rachycentron canadum*), king mackerel (*Scomberomorus cavalla*), and golden crab (*Chaceon fenneri*). Information on the EFH of these species can be found on the NMFS Northeast Regional Office, Habitat Conservation Division's Web site at http://www.nero.noaa.gov/hcd/.

In addition to EFH, Habitat Areas of Particular Concern (HAPC) have been identified for two species in the Northeast region: Atlantic cod and Atlantic salmon. HAPCs are habitats judged to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation. A summary of the Northeast HAPCs can be found at http://www.nero.noaa.gov/hcd/efhtables.pdf.

Lastly, North Atlantic right whale critical habitat has been identified offshore of Massachusetts in Cape Cod Bay and the Great South Channel (50 CFR 226.203 (a)(1) and (a)(2)). These areas are two of the only four known principal feeding grounds (and only two within U.S. waters) for adult right whales in the Western North Atlantic. Cape Cod Bay is an important, somewhat protected, spring foraging area. Although highly endangered right whales can be found in all months in the Cape Cod Bay, they are most abundant between February and May with a peak in abundance in March, when their primary prey, copepods, are abundant (NMFS, 2005). Cape Cod Bay also represents an important nursery habitat for calves born in the late winter that enter the Cape Cod Bay with their mothers shortly after birth. In addition to Cape Cod Bay, large aggregations of right whales are often found in the central to western portion of the basin within the Great South Channel. Researchers believe that a significant proportion of the western North Atlantic right whale population uses the Great South Channel as a feeding area each spring, aggregating to exploit exceptionally dense copepod patches.

No studies have been conducted on the effects of sink gillnets on benthic habitats (see review of available scientific information in Stevenson et al., 2004). However, the direct habitat impacts of this gear have been evaluated by two panels of experts. The first group, convened in October of 2001 to assess the impacts of different types of bottom-tending gear used in the Northeast Region, concluded that sink gillnets and longlines "cause some low degree impacts in mud, sand, and gravel habitats" (NEFSC, 2002). They noted that anchored gillnets still move around over the bottom to some extent and that direct effects could include alteration of physical structure and injury or death of emergent epifauna such as sponges, bryozoans, tunicates, or soft corals. The second workshop was held in March of 2002 with the purpose of evaluating bycatch and habitat damage for ten classes of fishing gear used in U.S. waters. Based on the judgment of the workshop participants and responses provided in a follow-up mail survey, the physical habitat impacts of sink gillnets were ranked as medium and the biological impacts as low on a scale that ranged from very low to very high (Morgan and Chuenpagdee, 2003). Impacts cited in the report were very similar to those noted in the first workshop, i.e., the breaking or uprooting of structures and organisms in strong currents or when the gear is hauled out of the water. Based on this information, any adverse impacts associated with the use of sink gillnets in the Northeast Region are expected to be minimal, except in gravel or rocky areas with emergent epifauna.

Structures that support the copepod and plankton abundance that provide the habitat's value to right whales are not likely to be affected by gillnet gear. Additionally, none of the proposed measures presented in Section 2 of this EA are likely to modify fishing practices in a manner that

would adversely affect EFH, HAPC, right whale critical habitat, or the habitat of harbor porpoises, or any other protected or listed marine species.

### 3.2.2 Protected Species

Table 3-1 lists protected species found in the waters offshore of the Northeast U.S. and notes which species may be affected by the fisheries and management actions under the HPTRP. Note that while all marine mammals are protected under MMPA, a number of the large whales are also listed as endangered under the ESA. Additionally, all sea turtles, two species of birds and two species of fish are found within the environment of the waters of the Mid-Atlantic Bight, southern New England, and the GOM, and are listed as endangered or threatened under the ESA. Critical habitat for right whales also occurs within New England waters affected by the HPTRP. However, as discussed above, gillnets are believed to have little effect on habitat, and no measures are proposed that would increase their likelihood of affecting critical habitat or associated species.

Many of the protected species that occur in New England and Mid-Atlantic waters have never been observed as bycatch in gillnet fisheries in the areas and seasons managed under the HPTRP and analyzed in this EA, nor have they been documented as killed by possible gillnet interactions in stranding records. These species are listed as "not likely to be affected" in Table 3-1. Although these species occur within the geographical area influenced by the HPTRP, they may inhabit areas other than those affected by the HPTRP, or may migrate through the area at times when implementing regulations are not in place. Detailed species accounts are given below only for those species that have been observed incidentally taken in gillnet fisheries, and could be affected by the measures of the HPTRP.

The potential effects of pingers on protected and marine species, such as endangered large whales, sea turtles, pinnipeds, and certain fish species (such as American shad, Atlantic herring, blueback herring, and alewives) were analyzed in Section 4.3 of the HPTRP Final EA that analyzed the effects of implementing the HPTRP (NMFS, 1998). It was concluded that the impacts of pingers on these marine organisms would be low or not likely to occur.

Most of the information regarding marine mammal distribution, abundance, and sources of injury and mortality discussed in this section is paraphrased from the 2006, 2007 and 2008 Stock Assessment Reports (Waring et al., 2007a; Waring et al., 2007b; Waring et al., 2009), prepared as required by Section 117 of the 1994 amendments to the MMPA.

**Table 3-1: Protected Species Found in New England and Mid-Atlantic Waters**

| Effects of the HPTRP | Category | Species | Status |
|---|---|---|---|
| Not likely to be affected by the Harbor Porpoise Take Reduction Plan | Large Whales | Blue whale (*Balaenoptera musculus*) | Endangered |
| | | Sei whale (*Balaenoptera borealis*) | Endangered |
| | | Sperm whale (*Physeter macrocephalus* | Endangered |
| | Smaller Cetaceans | Spotted and Striped dolphin (*Stenella* spp.) | Protected |
| | | White-beaked dolphin (*Lagenorhynchus albirostris*) | Protected |
| | | Pilot whale (*Globicephala* spp.) | Protected |
| | | Dwarf sperm whale (*Kogia sima*) | Protected |
| | | Pygmy sperm whale (*Kogia breviceps*) | Protected |
| | | Cuvier's beaked whale (*Ziphius cavirostris*) | Protected |
| | | Mesoplodon beaked whale (*Mesoplodon spp*) | Protected |
| | Birds | Piping plover (*Charadrius melodus*) | Endangered |
| | | Roseate tern *(Sterna dougallii dougallii*) | Endangered |
| | Sea Turtles | Leatherback sea turtle (*Dermochelys coriacea*) | Endangered |
| | | Green sea turtle (*Chelonia mydas*) | Threatened |
| | | Hawksbill sea turtle (*Eretmochelys imbricata*) | Endangered |
| | Fish | Atlantic salmon (*Salmo salar*) | Endangered |
| | | Shortnose sturgeon (*Acipenser brevirostrum*) | Endangered |
| Potentially affected by the Harbor Porpoise Take Reduction Plan | Large Whales | North Atlantic right whale (*Eubalaena glacialis*) | Endangered |
| | | Humpback whale (*Megaptera novaeangliae*) | Endangered |
| | | Fin whale (*Balaenoptera physalus*) | Endangered |
| | | Minke whale (*Balaenoptera acutorostrata)* | Endangered |
| | Smaller Cetaceans | Harbor porpoise (*Phocoena phocoena)* | Protected |
| | | Bottlenose dolphin (*Tursiops truncatus*) | Protected |
| | | Atlantic white-sided dolphin *(Lagenorhynchus acutus*) | Protected |
| | | Common dolphin (*Delphinus delphis*) | Protected |
| | | Risso's dolphin (*Grampus griseus*) | Protected |
| | Seals | Harbor seal (*Phoca vitulina*) | Protected |
| | | Gray seal (*Halichoerus grypus*) | Protected |
| | | Harp seal (*Pagophilus groenlandicus*) | Protected |
| | | Hooded seal (*Cystophora crystata*) | Protected |
| | Sea Turtles | Kemp's ridley sea turtle (*Lepidochelys kempii*) | Endangered |
| | | Loggerhead sea turtle (*Caretta caretta*) | Threatened |
| | Fish | Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)* | Candidate for Threatened |

### 3.2.2.1 Marine Mammals

The following tables (Table 3-2 and 3-3) provide the estimated mean annual mortality of seals and small cetaceans taken in the Northeast sink gillnet fishery and Mid-Atlantic gillnet fishery. Only those stocks that overlap with harbor porpoises in their distribution are included. These data are based on takes observed by fishery observers between 2002 and 2006, as well as 2001 to 2005 for those affected species that have nothing more recent for data. Takes of large whales are not documented within these observer records. Large whales may swim off with fishing gear; therefore, documentation of their incidental take is based primarily on the observation of gillnet gear or markings on whale carcasses, or on whales entangled and observed at-sea. Frequently, it is difficult to attribute a specific gear type to observed scars or portions of gear remaining attached to whales or their carcasses; however, gillnet gear has been identified on entangled North Atlantic right whales, humpback whales, fin whales, and minke whales.

**Table 3-2: Estimated Marine Mammal Mortalities in Northeast Sink Gillnet Fishery**

| Species | Years Observed | Mean Annual Mortality (CV) | Total PBR |
|---|---|---|---|
| Harbor porpoise | 02-06 | 567 (0.14) | 610 |
| White-sided dolphin | 02-06 | 34 (0.33) | 509 |
| Common dolphin | 01-05 | 5 (0.8) | 1,000 |
| Risso's dolphin | 02-06 | 3 (0.93) | 124 |
| Harbor seal | 02-06 | 585 (0.15) | 2,746 |
| Gray seal | 02-06 | 314 (0.22) | n/a |
| Harp seal | 02-06 | 80 (0.31) | n/a |
| Hooded seal | 01-05 | 25 (0.82) | n/a |

Source: Waring et al. (2007b, 2009).

**Table 3-3: Estimated Marine Mammal Mortalities in Mid-Atlantic Gillnet Fishery**

| Species | Years Observed | Mean Annual Mortality (CV) | Total PBR |
|---|---|---|---|
| Harbor porpoise | 02-06 | 299 (0.27) | 610 |
| Coastal bottlenose dolphin | 02-06 | | |
| Northern Migratory stock | | Unknown* | 56 |
| Southern Migratory stock | | Unknown* | 79 |
| Southern North Carolina stock | | Unknown* | 32 |
| Harbor seal | 02-06 | 26 (0.49) | 2,746 |
| Gray seal | 02-06 | 17 (0.92) | n/a |

* Due to the revisions to the coastal bottlenose dolphin stock structure and implementation of the BDTRP, estimating the mean annual mortality for these stocks is not possible. However, these estimates will be updated in the 2009 SAR.

Source: Waring et al. (2009).

#### 3.2.2.1.1 Large Whales

**North Atlantic Right Whale** *(Eubalaena glacialis)*

The North Atlantic right whale is among the most endangered large whale species in the world. A revised Recovery Plan was published in June 2005 (NMFS, 2005). A 1998 census using photo-identification techniques resulted in a population estimate of 291 individuals. A review of the photo-identification recapture database in June 2006 identified 313 individually recognized whales known to be alive during 2001. Because this was a nearly complete census, it is assumed that this estimate represents a minimum population size. This value does not include animals that were alive prior to 2001, but not recorded in the catalogue as seen during 2001-2004. It also does not include any calves known to be born after 2001, but not entered as new animals in the catalog (Waring et al., 2007a). An updated Recovery Plan for this species was published in 2005 (NMFS, 2005).

The low population size indicates that the North Atlantic right whale stock is well below its optimum sustainable population level. Analysis conducted by the International Whaling Commission concluded that survival had declined in the 1990's (Best et al., 2001). Additionally, an analysis of calving intervals through the 1997/1998 season suggests that the mean calving interval has increased since 1992 from 3.67 years to over 5 years (a significant trend), meaning that individual breeding females are not producing calves as frequently as they have in the past. Due to the small population size and continuing decline of the population, the PBR for right whales is zero.

North Atlantic right whales occur throughout the area and seasons affected by the HPTRP. The whales range from wintering and calving grounds in coastal waters of the southeastern United States to summer feeding and nursery grounds from New England waters north to the Bay of Fundy and the Scotian Shelf. Within that range, research suggests the existence of six major habitats or congregation areas, including coastal waters of the southeastern United States, the Great South Channel, Georges Bank/GOM, Cape Cod and Massachusetts Bays, the Bay of Fundy, and the Scotian Shelf. Systematic surveys conducted off the coast of North Carolina during the winters of 2001 and 2002 sighted eight calves, suggesting the calving grounds may extend as far north as Cape Fear, which is off southern North Carolina. Four of the calves were not sighted by surveys conducted further south. One of the cows photographed was new to researchers, having effectively eluded identification over the period of its maturation (McLellan et al., 2004).

The Northeast Fisheries Science Center conducts an extensive multi-year aerial survey program throughout the GOM region; this program is intended to better establish the distribution of right whales, including evaluating the inter-annual variability in right whale occurrence in previously poorly studied habitats. New England waters are a primary feeding habitat for right whales, which feed mainly on copepods (largely of the genera *Calanus* and *Pseudocalanus*) in this area. Research suggests that right whales must locate and exploit extremely dense patches of zooplankton to feed efficiently (Mayo and Marx, 1990). These dense zooplankton patches are likely a primary characteristic of the spring, summer, and fall right whale habitats (Kenney et al., 1986; Kenney et al., 1995). Acceptable surface copepod resources are limited to perhaps 3% of

the region during the peak feeding season in Cape Cod and Massachusetts Bays (C. Mayo, pers comm, as cited in Waring et al., 2007a). While feeding in the coastal waters off Massachusetts has been better studied than other areas, right whale feeding has also been observed on the margins of Georges Bank, in the GOM, in the BOF, and over the Scotian Shelf. In addition, New England waters serve as a nursery area for calves. NMFS and Provincetown Center for Coastal Studies aerial surveys during springs of 1999-2006 found right whales along the northern edge of Georges Bank, in Georges Basin, the Great South Channel and in various locations in the GOM, including Cashes Ledge, Platts Bank, and Wilkinson Basin (Waring et al., 2009).

Specific details of right whale entanglement in fishing gear are sparse. When direct or indirect mortality occurs, some carcasses come ashore and are subsequently examined, or are reported as "floaters" at sea. The number of unreported and unexamined carcasses is unknown, but may be significant in the case of floaters. Reports of mortality and serious injury relative to PBR as well as total human impacts are contained in records maintained by the New England Aquarium and the NMFS Northeast and Southeast Regional Offices. From 2002 through 2006, seven of 19 records of mortality or serious injury (including records from both USA and Canadian waters) involved entanglement or fishery interactions (Waring et al., 2009). The reports often do not contain the detail necessary to assign the entanglements to a particular fishery or location. In a recent analysis of the scarification of right whales, a total of 75.6% of 447 whales examined during 1980-2002 had at least one scar from interactions with fishing gear (Knowlton et al., 2005). Further research using the North Atlantic Right Whale Catalogue has indicated that, annually, between 14% and 51% of right whales are involved in entanglements (Knowlton et al., 2005). Entanglement records from 1970 through 2004 maintained by NMFS Northeast Regional Office (NOAA NMFS, unpublished data) included at least 92 right whale entanglements or possible entanglements, including right whales in weirs, in gillnets, and in trailing line and buoys. Incidents of entanglements in groundfish gillnet gear, cod traps, and herring weirs in waters of Atlantic Canada and the U.S. east coast were summarized by Read (1994). In six records of right whales becoming entangled in groundfish gillnet gear in the BOF and GOM between 1975 and 1990, the whales were either released or escaped on their own, although several whales were observed carrying net or line fragments. Although many of these records can not be attributed to a specific fishery, management actions resulting from modifications to the HPTRP such as closure areas may benefit right whales where they overlap in distribution. However; because closures primarily result in a shifting of gillnet effort rather than a reduction in effort, benefits are difficult to determine and likely negligible.

For the period 2002 through 2006, the total estimated human-caused mortality and serious injury to right whales is estimated at 3.8 per year (U.S. waters, 2.4; Canadian waters, 1.4) (Waring et al., 2009). This is derived from two components: 1) non-observed fishery entanglement records at 1.4 per year (U.S. waters, 0.6; Canadian waters, 0.8), and 2) ship strike records at 2.4 per year (U.S. waters, 1.8; Canadian waters, 0.6). Beginning with the 2001 SAR, Canadian records were incorporated into the mortality and serious injury rates of this report to reflect the effective range of this stock. It is also important to stress that serious injury determinations are made based upon the best available information and these determinations may change with the availability of new information (Cole et al., 2005). The figure of 3.8 mortalities per year is a minimum estimate, as decomposed and/or unexamined carcasses that are reported may be the undocumented result of bycatch or a ship strike. Additionally, it is likely that many carcasses drift out to sea without

being observed or recovered. Although many of these records can not be attributed to a specific fishery, management actions resulting from modifications to gillnet fisheries resulting from the HPTRP may benefit right whales where they overlap in distribution. Since overall reduction in effort is not anticipated, however, these benefits are likely to be negligible.

**Humpback Whale** (*Megaptera novaeangliae*)

Humpback whales are listed as endangered under the ESA. A Recovery Plan has been published and is in effect (NMFS, 1991). The best estimate of abundance for the GOM feeding aggregation of North Atlantic humpback whales is 847 (CV=0.55), and the minimum population estimate for this stock is 549 (Waring et al., 2009). The PBR for this stock is 1.1 humpback whales per year.

The Western North Atlantic stock whales calve and mate in the West Indies during the winter and migrate to northern feeding areas during the summer months. In the GOM, sightings are most frequent from mid-March through November between 41° N latitude and 43° N latitude, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge, and peak in May and August (CETAP, 1982). Studies have matched 27% of the individuals on the Canadian Scotian Shelf to the GOM population (Clapham et al., 2003) and one study identified a GOM whale as far away as west Greenland (Katona and Beard, 1990). Small numbers of individuals may be present in New England waters year-round, including the waters of Stellwagen Bank (Clapham et al., 1993). They feed on a number of species of small schooling fishes, particularly sand lance, mackerel, and Atlantic herring, by targeting fish schools and filtering large amounts of water for their associated prey. Humpback whales have also been observed feeding on krill (Wynne and Schwartz, 1999).

Although data are presently inconclusive, humpback whales are assumed to use the Mid-Atlantic as a migratory pathway to and from the calving/mating grounds. The Mid-Atlantic may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the Mid-Atlantic have been increasing during the winter months, peaking from January through March (Swingle et al., 1993). Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the Mid-Atlantic since they are not participating in reproductive behavior in the Caribbean (Barco et al., 2002). Swingle et al. (1993) identified a shift in distribution of juvenile humpback whales to the nearshore waters of Virginia, primarily in winter months. Identified whales using the Mid-Atlantic area were found to be residents of the GOM and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding populations in the Mid-Atlantic region (Barco et al., 2002). Strandings of humpback whales have increased between New Jersey and Florida since 1985, consistent with the increase in Mid-Atlantic whale sightings. Strandings were most frequent from September through April in North Carolina and Virginia waters, and involved primarily juvenile humpback whales of no more than 11 m (36 ft) in length (Wiley et al., 1995).

A review of additional records suggests that there are likely significant human impacts beyond those recorded by NMFS' observer program. For example, a study of entanglement-related scarring on the caudal peduncle of 134 individual humpback whales in the GOM suggested that between 48% and 65% had experienced entanglements (Robbins and Mattila, 2001).

Decomposed and/or unexamined animals (e.g., carcasses were reported but not retrieved or a necropsy was not performed) can not be attributed to specific causes of mortality. Some of the humpback whales with serious or fatal injuries were found entangled in the area affected by this action, with croaker gillnet gear, deep abrasions, blunt trauma, sink gillnet, and unidentified line and netting observed (Waring et al., 2007a). Details of disentanglement events are available from the NMFS Web site at (http://www.nero.noaa.gov/whaletrp/plan/disent/index.html). Although many of these records can not be attributed to a specific fishery, management actions resulting from modifications to the HPTRP may benefit humpback whales where the measures overlap with humpback whale distribution. However; because closures primarily result in a shifting of gillnet effort rather than a reduction in effort, benefits are difficult to determine and likely negligible.

For the period 2002 through 2006, the total estimated human-caused mortality and serious injury to the GOM humpback whale stock was 4.4 animals per year (U.S. waters, 4.0; Canadian waters, 0.4). This average was derived from incidental fishery interaction records, 3.0 (U.S. waters, 2.6; Canadian waters, 0.4); and records of vessel collisions, 1.4 (U.S. waters, 1.4; Canadian waters, 0) (Waring et al., 2009). These averages include humpback whale mortalities and serious injuries that occurred in the southeastern and Mid-Atlantic states because these whales were assumed to be members of the GOM stock unless they could be identified as members of another humpback whale stock (Waring et al., 2009).

**Fin Whale** (*Balaenoptera physalus*)

The best available estimate of abundance for the Western North Atlantic stock of fin whales is 2,269 (CV=0.37), and the minimum population estimate is 1,678 (Waring et al., 2009). The fin whale is listed as endangered under the ESA. A draft Recovery Plan was made available in July 2006. The PBR for this stock is 3.4 (Waring et al., 2009).

Fin whales inhabit a wide range of latitudes between 20º N and 75º N and 20º S and 75º S (Perry et al., 1999). Like right and humpback whales, fin whales are believed to use high latitude waters primarily for feeding, and low latitude waters for calving. However, evidence regarding where the majority of fin whales winter, calve, and mate is still scarce. Clark (1995) reported a general pattern of fin whale movements in the fall from the Labrador/Newfoundland region, south past Bermuda and into the West Indies, but neonate strandings along the U.S. Mid-Atlantic coast from October through January suggest the possibility of an offshore calving area (Hain et al., 1992; Clark, 1995).

The prey of fin whales varies greatly in different areas depending on what is locally available (International Whaling Commission, 1992). In the western North Atlantic, fin whales feed on a variety of small schooling fish (e.g., herring, capelin, and sand lance) as well as squid and planktonic crustaceans (Wynne and Schwartz, 1999).

Bycatch of fin whales, which are large enough to swim off with gear, is rarely documented. A review of 26 records of stranded or floating (dead or injured) fin whales for the period of 1992 through 2000 showed that five had formerly been entangled in fishing gear (Waring et al., 2007a). Eight entanglements, including 3 fatalities, were confirmed between 2001 and 2005

(Nelson et al., 2007). Observers, however, reported no fishery-related mortality or serious injury to fin whales in fisheries observed by NMFS during 2002 through 2006. A review of NMFS stranding records from 2002 through 2006, however, yielded an average of 2.0 human-caused mortalities and serious injuries per year (U.S. waters, 1.6; Canadian waters, 0.4) - 0.8 per year resulting from fishery interactions/entanglements (U.S. waters, 0.8; Canadian waters, 0;), and 1.2 due to vessel collisions (U.S. waters, 0.8; Canadian waters, 0.4) (Waring et al., 2009). The management actions such as gillnet closures associated with the HPTRP may benefit fin whales where they overlap in distribution with harbor porpoises. However, because gillnet fishing effort will likely shift to adjacent waters, benefits may be negligible.

**Minke Whale** (*Balaenoptera acutorostrata*)

Minke whales off the eastern coast of the United States are considered to be part of the Canadian east coast population, which inhabits the area from the eastern half of Davis Strait south to the Gulf of Mexico. Minke whales are not listed as endangered or threatened under the ESA, although the species is protected under the MMPA. The best estimate of the population is 3,312 (CV=0.74), and the minimum population estimate is 1,899 (Waring et al., 2009). The PBR for this stock is 19.

Fishing gear entanglements appear to account for the majority of the human-caused mortalities of minke whales. Between 2001 and 2005, 30 minke whale entanglements were reported, including 11 mortalities (Nelson et al., 2007). The mouth and tail stock/fluke regions are a common entanglement location for those minke whales that were seriously injured or killed. Feeding behavior may be an important factor that contributes to this entanglement risk (Waring et al., 2007a). Minke whales in the Northwest Atlantic typically feed on small schooling fish, such as sand lance, herring, cod, and mackerel (Ward, 1995). The whales may follow the movements of their prey and subsequently swim closer to shore, where heavy concentrations of fishing gear make them more susceptible to entanglements. Studies conducted in the Bay of Fundy and Gulf of St. Lawrence indicated that minke whales feed by displaying surface lunges and by rolling (Sears et al., 1981; Haycock and Mercer, 1984). In contrast, a study conducted on minke whales in Cape Cod Bay and Massachusetts Bay showed a lack of surface feeding behavior (Murphy, 1995). It is likely, however, that large whales may encounter gear in any part of the water column.

During 2002 to 2006, the U.S. total annual estimated average human-caused mortality was 2.2 minke whales per year (CV=unknown), plus an unknown bycatch estimate from the Northeast bottom trawl fishery (Waring et al., 2009). This is derived from three components: an unknown number of minke whales per year from U.S. fisheries using observer data, 1.8 minke whales per year (unknown CV) from U.S. fisheries using strandings and entanglement data, and 0.4 minke whales per year from ship strikes. During 1997 to 2001, there were no confirmed mortalities or serious injuries in Canadian waters as reported by the various, small-scale stranding and observer data collection programs in Atlantic Canada. No additional information is available on Canadian mortalities from 2002 to present (Waring et al., 2009).

The Northeast sink gillnet fishery was responsible for the observed take of two minke whales between 1989 and the present. One occurred in July 1991 south of Penobscot Bay, Maine and

resulted in mortality. The other occurred in October 1992 near Jeffreys Ledge off the coast of New Hampshire and the animal was released alive (Waring et al., 2007a). The Mid-Atlantic gillnet fishery was determined to be responsible for the take of a minke whale in July 1998 off Long Island, in a month when no HPTRP management measures are in effect (Waring et al., 2007a). The gear types identified in these incidents were comparable to the gear used elsewhere in the fishery and throughout harbor porpoise habitat. Additional gear associated with bycatch of minke whales includes unspecified fishing net, unspecified cables or lines, seines, lobster gear, and gillnets. The ALWTRP provides some protection to minke whales. Additionally, management actions such as gillnet closures associated with the HPTRP may benefit minke whales where they overlap in distribution with harbor porpoise. However, because gillnet fishing effort will likely shift to adjacent waters, benefits may be negligible.

#### 3.2.2.1.2 Smaller Cetaceans

**Harbor Porpoise** (*Phocoena phocoena*)

Harbor porpoises in the waters off of the eastern U.S. coast are considered to be part of the GOM/BOF stock, one of four harbor porpoise stocks found in the Western North Atlantic. NMFS proposed listing harbor porpoise in 1993 primarily due to a high level of incidental take of harbor porpoises in sink gillnet fisheries along the Atlantic coast of the U.S. and Canada. Implementation of management measures to reduce the incidental take of harbor porpoise in both the U.S. and Canadian waters resulted in a determination in 1999 that listing was not necessary (NMFS, 2001). The most recent surveys, conducted in 2006, estimated the GOM/BOF harbor porpoise stock size of 89,054 animals (CV=0.47), slightly lower than previous estimates (Waring et al., 2009). The minimum population estimate is 60,970. Based on these abundance estimates the PBR for harbor porpoises is 610.

Waring et al. (2009) provides the following account of harbor porpoise distribution. During the summer months (July to September), harbor porpoises are concentrated in the northern GOM and southern BOF region, generally in waters less than 150 m (492 ft) deep (Gaskin, 1977; Kraus et al., 1983; Palka, 1995a; Palka, 1995b), with a few sightings in the upper Bay of Fundy and on the northern edge of Georges Bank (Palka, 2000). During the fall (October-December) and spring (April-June), harbor porpoises are widely dispersed from New Jersey to Maine, with lower densities farther north and south. They are seen from the coastline out to deep waters (>1800 m, (> 5906 ft) deep) although the majority of the population is found over the continental shelf. During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, and lower densities are found in waters off New York to New Brunswick, Canada. There does not appear to be a temporally coordinated migration or a specific migratory route to and from the Bay of Fundy region. However, during the fall, several satellite tagged harbor porpoises did favor the waters around the 92 m (302 ft) isobath, which is consistent with observations of high rates of incidental catches in this depth range (Read and Westgate, 1997). There were two stranding records from Florida during the 1980s (Smithsonian strandings database) and one during 2003 (NE Regional Office/NMFS strandings and entanglement database), suggesting occasional, extralimital occurrence south of Cape Hatteras, North Carolina.

Prior to the development and implementation of the HPTRP in late 1998, the bycatch estimate of the GOM/BOF stock of harbor porpoises, with a PBR from 1994 to 1998 of 483 animals, exceeded 1,500 animals per year in U.S. sink gillnet fisheries (see Table 3-4, below). Along with implementation of the HPTRP, which included seasonal gear restrictions, modifications, and closures in the GOM and the Mid-Atlantic (63 FR 66464, December 2, 1998), restrictions have been implemented under various FMPs that have closed areas to gillnet fishing and reduced effort in groundfish, monkfish and dogfish gillnet fisheries. After implementation of the HPRTP, harbor porpoise bycatch decreased to below the PBR level. Between 2001, when the most recent HPTRP modification was implemented (66 FR 2336, January 11, 2001), and 2003, mortalities and serious injuries remained below PBR. Despite these measures, harbor porpoise takes have increased rather than continued to approach ZMRG (Figure 3-1). The most recent estimates of bycatch indicate that the average bycatch rate exceeded PBR for the period between 2001 and 2005 (Table 3-4).

**Figure 3-1: Annual harbor porpoise bycatch (harbor porpoise takes per metric tons of landings) compared to PBR from 1990-2006**

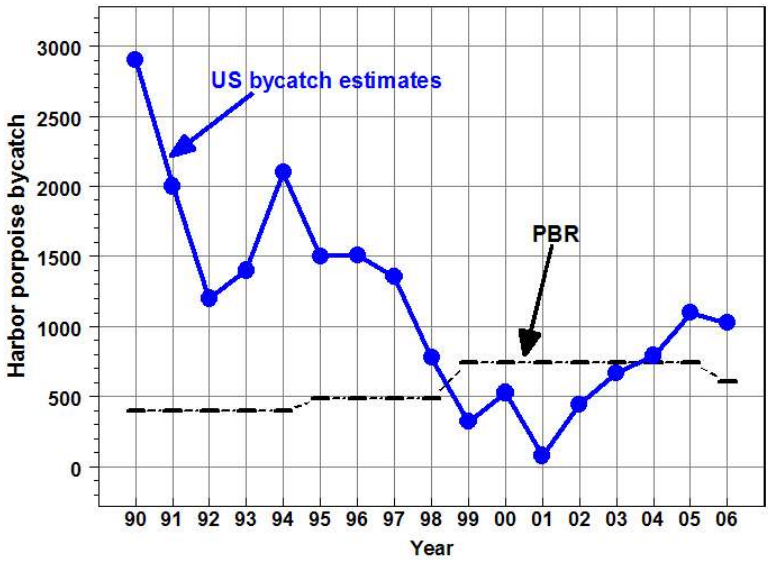


**Table 3-4: U.S. Fishery-Related Mortality Estimates for the GOM/BOF Stock of Harbor Porpoises**

| Years | Best Estimated Population Size | PBR | Mean Annual Mortality in U.S. Fisheries |
|---|---|---|---|
| 1994-1998 | 54,300 animals | 483 animals/year | 1,521 animals/year |
| 1999-2001 | 89,700 animals | 747 animals/year | 310 animals/year |
| 1999-2003 | 89,700 animals | 747 animals/year | 417 animals/year |
| 2000-2004 | 89,700 animals | 747 animals/year | 515 animals/year |
| 2001-2005 | 89,054 animals | 610 animals/year | 652 animals/year |
| 2002-2006 | 89,054 animal | 610 animals/year | 866 animals/year |

Sources: Waring et al. (2000), Waring et al. (2004), Waring et al. (2006), Waring et al. (2007a), Waring et al. (2007b), Waring et al. (2009).

The total annual estimated average human-caused mortality of harbor porpoises between 2002 and 2006 was 874 (CV=0.13) harbor porpoises per year, including 866 harbor porpoises per year (CV=0.13) from U.S. fisheries based on observer and Marine Mammal Authorization Program (MMAP) data, 2 per year (unknown CV) from Canadian herring weir fisheries based on observer data, and 5.7 per year from U.S. unknown fisheries based on strandings data (Waring et al., 2009).

NMFS analyzed observer data from January 1, 1999, through May 2007 from different geographic areas to detect patterns in the overall increase in porpoise bycatch in U.S. gillnet fisheries. Based on these analyses (summarized in Section 1, and see Appendix A) the primary issues contributing to the observed increase in harbor porpoise takes in U.S. fisheries include poor compliance with existing measures and increased bycatch outside of existing management areas. NMFS implemented an extensive outreach and enforcement program in late 2006 that appeared to immediately improve compliance and reduce harbor porpoise bycatch rates in the first quarter of 2007. Additionally, NMFS convened the HPTRT in December of 2007, resulting in the development of the alternatives evaluated in this Environmental Assessment to further reduce the affects of gillnet fisheries in the Mid-Atlantic and New England on the GOM/BOF harbor porpoise stock.

**Bottlenose Dolphin** (*Tursiops truncatus*)

Bottlenose dolphins inhabit waters in the western North Atlantic Ocean (Hersh and Duffield, 1990; Mead and Potter, 1995; Curry and Smith, 1997) along the U.S. Atlantic coast. There are two morphologically and genetically distinct bottlenose dolphin morphotypes (Duffield et al., 1983; Duffield, 1986) that have been taken in gillnet fisheries in the Mid-Atlantic and New England. These two morphotypes have distinct mitochondrial and nuclear markers (Hoelzel et al., 2002) and are described as the coastal and offshore forms. Aerial surveys and sightings data alone are not sufficient to distinguish between the two morphotypes. However, tissue analyses indicate dolphins within 7.5 km (4.7 mi) from shore were most likely the coastal morphotype, and there was extensive overlap between the coastal and offshore morphotype between 7.5 and 34 km (4.7-21 mi) from shore south of Cape Hatteras, North Carolina (Waring et al., 2009).

Offshore Morphotype

The offshore form is distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic Ocean and is found seasonally as far north as Georges Bank. During the spring and summer, bottlenose dolphin sightings occurred along the continental shelf break from Georges Bank to Cape Hatteras (CETAP, 1982; Kenney, 1990). In Canadian waters, bottlenose dolphins have occasionally been sighted on the Scotian Shelf, particularly in the Gully (Gowans and Whitehead, 1995; NMFS, unpublished data). The range of the offshore bottlenose dolphin may include waters beyond the continental slope, and offshore bottlenose dolphins may move between the Gulf of Mexico and the Atlantic (Wells et al., 1999).

Waring et al. (2009) identifies the best available estimate for offshore morphotype bottlenose dolphins as the sum of the estimates from a summer 2002 aerial survey covering the continental shelf, a summer 2004 vessel survey south of Maryland, and a summer 2004 vessel and aircraft survey north of Maryland. The minimum population estimate for the Western North Atlantic offshore bottlenose dolphin stock is 70,775, with a PBR of 566.

Bottlenose dolphin takes in the Northeast Region were observed in pelagic drift gillnet and pair trawl fisheries in the 1990s (Waring et al., 2009). The only documented mortality of a bottlenose dolphin in a bottom trawl fishery was observed in 1991. A few bottlenose dolphin takes have been documented in the pelagic longline fishery, though the animals were released alive. In 2004, there was one observed mortality of an offshore bottlenose dolphin taken in the Northeast sink gillnet fishery; additionally, in 2005 there was an observed mortality in the Mid-Atlantic gillnet fishery (Waring et al., 2009). Many stranded bottlenose dolphins show signs of human interactions, though it is unclear what proportion of the strandings comes from each morphotype (Waring et al. 2009).

The offshore morphotype is currently not considered depleted under the MMPA. However, the fishery-related mortalities for 2002-2006 have not been estimated, and it is unknown whether total serious injury and mortality can be considered insignificant (Waring et al., 2009).

Coastal Morphotype

The coastal morphotype of bottlenose dolphins is distributed along the Atlantic coast, south along the Florida peninsula and into the Gulf of Mexico. Mitochondrial DNA shows that nearshore animals in the Gulf of Mexico and along the Western North Atlantic represent different stocks. Recent analyses of strandings data, genetics, photo-identification, stable isotope studies, and satellite telemetry have lead to a revised stock structure for bottlenose dolphins (Waring et al., 2009). For example, there are nine new and distinct Atlantic Bay, Sound, and Estuary Stocks defined from North Carolina through Florida's east coast; coastal stocks off South Carolina and Georgia were combined; and a new migratory coastal stock was defined. A review of the new Atlantic Bay, Sounds, and Estuary stocks can be found in the 2009 Draft Stock Assessment Reports at:
http://www.nmfs.noaa.gov/pr/pdfs/sars/ao2009_draft_bottlenose.pdf.

The coastal morphotype of bottlenose dolphins in the Western North Atlantic is comprised of seven prospective stocks: the Northern Migratory, Southern Migratory, Southern North Carolina, South Carolina, Georgia, Northern Florida, and Central Florida stocks (Waring et al., 2009). The true population is likely more complex, and research continues to refine stock structure. Three of the seven stocks will be discussed here since they overlap with the distribution of harbor porpoises. These are the Northern Migratory, Southern Migratory, and Southern North Carolina stocks.

The complex stock structure of the coastal morphotype of bottlenose dolphins makes identification of a population size and associated PBR of bottlenose dolphins in the Mid-Atlantic difficult. Bottlenose dolphins in the Northern Migratory stock spend the summers as far north as Long Island, New York and through the North Carolina coast. In the winter, when the HPTRP is in effect and distribution appears to be limited by water temperature, the stock migrates south and resides primarily between the North Carolina/Virginia border and through North Carolina to south of Cape Hatteras. The Southern Migratory stock occurs off the coast of North Carolina in the summer, and extends south between South Carolina and Florida during the winter. The Southern North Carolina resident population exists primarily along the southern coast of North Carolina or in Pamlico Sound year-round (Waring et al., 2009).

The primary known source of fishery-related mortality of the Northern Migratory, Southern Migratory, and Southern North Carolina stocks of bottlenose dolphins is the Mid-Atlantic gillnet fishery. However, the five-year average mortality due to this fishery is currently unknown (Waring et al., 2009). There were two observed mortalities in 2002 that were most likely taken from the Northern Migratory stock. Four additional mortalities occurred along the North Carolina coast near Cape Hatteras, which most likely were taken from the prospective Southern Migratory stock: one each in 2003 and 2004, and two in 2006 (Waring et al., 2009). Identifying the effects of fisheries on these stocks and determining mean annual mortality for each stock due to fisheries interactions is difficult due to the revisions to the stock structure and implementation of the BDTRP. However, mortality estimates will be updated in the 2009 SAR.

The following table, adapted from Waring et al. (2009), provides population estimates and associated PBR levels for the three coastal bottlenose dolphin stocks that overlap with the distribution of harbor porpoises. Note that this table does not include estuarine bottlenose dolphins as their distribution does not overlap with harbor porpoise distribution.

**Table 3-5: Estimates of abundance and the associated CV, minimum population estimate, and PBR for the coastal and offshore bottlenose dolphin management units that occur from North Carolina through Maine**

| Stock/Unit | Best Abundance Estimate (CV) | Minimum Population Estimate | PBR |
|---|---|---|---|
| Northern Migratory | 7,489 (0.36) | 5,582 | 56 |
| Southern Migratory | 10,341 (0.33) | 7,889 | 79 |
| Southern North Carolina | 4,818 (0.50) | 3,241 | 32 |

Source: Waring et al. (2009)

The coastal morphotype was designated as depleted under the MMPA, and therefore, is listed as strategic. Because one or more of the management units may be depleted, all of the management units currently retain the depleted status. Estimated annual mortality in fisheries such as the crab pot, pound net, and Mid-Atlantic gillnet are currently unknown pending the collection of additional data and completion of analyses (Waring et al., 2009). Coastal bottlenose dolphin takes have been observed in the shark gillnet fishery in Florida; however, this does not overlap the range of harbor porpoises or the HPTRP. The BDTRP was implemented on May 26, 2006 to address bottlenose dolphin serious injuries and mortalities incidental to commercial fisheries.

Most of the takes documented for the coastal morphotype in the Mid-Atlantic occurred during months when the measures of the HPTRP are not in effect in these waters. One take was documented on March 13, 1999 in 8 inch mesh gillnet (NEFSC, unpublished data) after implementation of the HPTRP and the associated February 15 to March 15 large mesh gillnet closure. Although the regulations implementing the HPTRP will have little effect on bottlenose dolphins, the comprehensive measures under the BDTRP restrict gillnet use in the areas and seasons that coastal bottlenose dolphins occur.

**Atlantic White-Sided Dolphin** (*Lagenorhynchus acutus*)

Waring et al. (2009) reports that Atlantic white-sided dolphins are found from central West Greenland to North Carolina (about 35° 00' N) and perhaps as far east as 43° 00' W (Evans, 1987; Hamazaki, 2002). Distribution of sightings, strandings, and incidental takes suggest the possible existence of three stocks units: GOM, Gulf of St. Lawrence, and Labrador Sea stocks (Palka et al., 1997). Evidence for a separation between the population in the southern GOM and the Gulf of St. Lawrence population comes from a virtual absence of summer sightings along the Atlantic side of Nova Scotia. This was reported in Gaskin (1992), is evident in Smithsonian stranding records, and was obvious during abundance surveys conducted in the summers of 1995 and 1999 which covered waters from Virginia to the Gulf of St. Lawrence when white-sided dolphins were seen frequently in GOM waters and in waters at the mouth of the Gulf of St. Lawrence, but were rarely recorded between these two regions.

The GOM population of white-sided dolphins is most common in continental shelf waters from Hudson Canyon (approximately 39° 00' N) to Georges Bank and in the GOM and lower Bay of Fundy. Sightings data indicate seasonal shifts in distribution (Northridge et al., 1997). From January to May, low numbers of white-sided dolphins are found from Georges Bank to Jeffreys Ledge (off New Hampshire), with even lower numbers south of Georges Bank, as documented by a few strandings collected on beaches of Virginia and North Carolina. From June through September, large numbers of white-sided dolphins are found from Georges Bank to the lower Bay of Fundy. From October to December, white-sided dolphins occur at intermediate densities from southern Georges Bank to southern GOM (Payne and Heinemann, 1990). Sightings south of Georges Bank, particularly around Hudson Canyon, occur year round but at low densities. The waters off Virginia and North Carolina appear to be the southern extent of the species' range.

The best available current abundance estimate for the western North Atlantic stock of white-sided dolphins is 63,368 (CV=0.27) (Waring et al., 2009). This estimate is an average from

annual surveys conducted in August over the last eight years (2002 and 2006) to account for the large interannual variability of the abundance estimates for this stock. The minimum population estimate given is 50,883, with a PBR for the western North Atlantic stock of white-sided dolphin set at 509 animals.

Takes of white-sided dolphins have been documented in numerous U.S. fisheries along the east coast, particularly in bottom and mid-water trawl fisheries. An average of 34 (CV=0.33) fishery-related white-sided dolphin serious injuries and mortalities are estimated to occur annually based on observed takes in the Northeast sink gillnet fishery between 2002 and 2006 (Table 3-2). Between 1990 and 2006, 56 white-sided dolphin mortalities were observed taken in this fishery. Most were taken in waters south of Cape Ann, Massachusetts from April through December. In recent years, the majority of the observed mortalities have occurred east and south of Cape Cod, outside of the HPTRP areas. However, during 2002, one of the takes was off Maine within the fall Mid-Coast Management Area in a pingered gillnet. It is unclear how the proposed modifications to the HPTRP will affect white-sided dolphins because pingers have not been tested on dolphins and, if triggered, consequence areas (closed December through May in the GOM, and February through April in southern New England) occur primarily outside of the April through December periods of highest observed white-sided dolphin bycatch (April through December).

**Common Dolphin** (*Delphinus delphis*)

Common dolphins are widely distributed over the continental shelf along the 200-2000 m (656-6,562 ft) isobaths (Waring et al., 2007a) and over prominent underwater topography from 50º 00' N to 40º 00' S latitude (Evans, 1994). The species is less common south of Cape Hatteras, although schools have been reported as far south as eastern Florida (Gaskin, 1992). In waters off the northeastern U.S. common dolphins are distributed along the continental slope (100 to 2,000 m, 328-6562 ft) and are associated with Gulf Stream features (CETAP, 1982; Selzer and Payne, 1988; Waring et al., 1992; Hamazaki, 2002). Common dolphins occur from Cape Hatteras northeast to Georges Bank (35˚ 00' N to 42˚ 00' N) from mid-January to May (Hain et al., 1982; CETAP, 1982; Payne et al., 1984). Common dolphins move onto Georges Bank and the Scotian Shelf from mid-summer to autumn, with very large aggregations of more than 3,000 animals reported on Georges Bank in autumn. Common dolphins are occasionally found in the GOM (Selzer and Payne, 1988). Migration onto the Scotian Shelf and continental shelf off Newfoundland occurs during summer and autumn when water temperatures exceed 11ºC (Sergeant et al., 1970; Gowans and Whitehead, 1995).

The best abundance estimate for common dolphins is 120,743 animals (CV = 0.23). This is the sum of the estimates from two 2004 U.S. Atlantic surveys, where the estimate from the northern U.S. Atlantic is 90,547 (CV= 0.24), and from the southern U.S. Atlantic is 30,196 (CV =0.54). This joint estimate is considered best because the two surveys together have the most complete coverage of the species' habitat. The minimum population estimate for the western North Atlantic common dolphin is 99,975 and the PBR is 1,000 (Waring et al., 2007a).

Since 2001, bycatch of common dolphins occurs primarily in the Mid-Atlantic bottom trawl fishery: 118 animals annually (CV=0.13), with some in the Northeast bottom trawl (28 animals

annually [CV=0.13]). Very few takes occur in the Northeast gillnet fisheries (five animals annually [CV=0.80]) (Table 3-2, above). Additionally, no takes of common dolphins have been observed from 1998 through 2005 in the Mid-Atlantic gillnet fishery (Waring et al., 2007a). Modifications to the HPTRP are not likely to change the low bycatch rate of common dolphins in these fisheries.

**Risso's Dolphin** (*Grampus griseus*)

Risso's dolphins in the Northwest Atlantic occur from Florida to eastern Newfoundland (Leatherwood et al., 1976; Baird and Stacey, 1990). Off the northeast U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank in the spring, summer, and autumn (CETAP, 1982; Payne et al., 1984). In winter, Risso's dolphins are distributed throughout the Mid-Atlantic Bight outward into oceanic waters (Payne et al., 1984). In general, the population occupies the Mid-Atlantic continental shelf edge year round, and is rarely seen in the GOM (Payne et al., 1984). There is no information on stock structure of Risso's dolphin in the western North Atlantic, or to determine whether separate stocks exist in the Gulf of Mexico and Atlantic.

The maximum abundance estimate for Risso's dolphin is 20,479 (CV=0.59), including an estimate from the northern U.S. Atlantic of 15,053 (CV=0.78), and from the southern U.S. Atlantic of 5,426 (CV =0.54) (Waring et al., 2009). This joint estimate is considered to be the best estimate because the two surveys provide the most complete coverage of the population's habitat. The minimum population estimate for the Western North Atlantic stock of Risso's dolphin is 12,920, and the PBR has is 124.

The total annual estimated average fishery-related mortality or serious injury to this stock during 2002-2006 was 25 animals (CV=0.32), with only a few attributed to the Northeast sink gillnet fisheries, three animals (CV=0.93) (Table 3-2).

#### 3.2.2.1.3 Pinnipeds

**Harbor Seal** (*Phoca vitulina*)

Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine (Katona et al., 1993), and occur seasonally along the southern New England and New York coasts from September through late May (Schneider and Payne, 1983). Although the stock structure of the western North Atlantic population is unknown, it is thought that harbor seals found along the eastern U.S. and Canadian coasts represent one population (Temte et al., 1991). In U.S. waters, breeding and pupping normally occur in waters north of the New Hampshire/Maine border, although breeding occurred as far south as Cape Cod in the early part of the twentieth century (Temte et al., 1991; Katona et al., 1993). In recent years, their seasonal interval along the southern New England to New Jersey coasts has increased (Barlas, 1999; Hoover et al., 1999; Slocum et al., 1999; Schroeder, 2000; deHart, 2002). Scattered sightings and strandings have been recorded as far south as Florida (NMFS, unpublished data). A general southward movement from the Bay of Fundy to southern New England waters occurs in autumn and early winter (Rosenfeld et al., 1988;

Whitman and Payne, 1990; Barlas, 1999; Jacobs and Terhune, 2000). A northward movement from southern New England to Maine and eastern Canada occurs prior to the pupping season, which takes place from mid-May through June along the Maine coast (Richardson, 1976; Wilson, 1978; Whitman and Payne, 1990; Kenney, 1994; deHart, 2002). No pupping areas have been identified in southern New England (Payne and Schneider 1984; Barlas 1999). More recent information suggests that some pupping is occurring at high-use haulout sites off Manomet, Massachusetts (B. Rubinstein, pers comm, New England Aquarium as cited in Waring et al., 2009).

The maximum abundance estimate based on corrected total counts along the Maine coast in a 2001 survey is 99,340 (CV=0.097). The minimum population estimate is 91,546 (Waring et al., 2009). The PBR for U.S. waters is 2,746. Surveys conducted between 1981 and 2001 suggest an increasing trend (Waring et al., 2009).

For the period of 2002-2006, the total human caused mortality and serious injury to harbor seals is estimated to be 621 per year (Waring et al., 2009). Researchers and fishery observers have documented incidental mortality in several fisheries, particularly within the GOM (see below). An unknown level of mortality also occurred in the mariculture industry (i.e., salmon farming), and by deliberate shooting (NMFS, unpublished data). As showing in Table 3-3, an average of 611 takes (CV=0.15) occurs each year. The majority of human caused mortality and serious injury, occurs in the Northeast sink gillnet fishery.

The use of pingers does not appear to affect seal bycatch. The estimated total fishery related mortality of harbor seals from 1994-1998, before pingers were required, was 873 (Waring et al., 2000), similar to the current human-caused mortality estimate of 611 mortalities or serious injuries per year (Waring et al., 2009). To address fishermen's concerns about the attraction of seals to pingers, a review of observer data collected between January 1, 1999 and May 31, 2007 found that seal (combined harbor and gray) bycatch rates in hauls with pingers fluctuated between years, with no increasing trend that would suggest habituation over time (Palka et al., 2008b) (Appendix D). Additionally, bycatch rates in hauls with or without pingers did not show any strong pattern, although the bycatch rate of hauls without pingers was slightly larger overall.

**Gray Seal** (*Halichoerus grypus*)

The western North Atlantic stock of gray seals can be found from New England to Labrador (Davies, 1957; Mansfield, 1966; Katona et al., 1993; Lesage and Hammill, 2001). Current estimates of the population, which appears to be increasing in abundance and occurring throughout a wider range, are not available (Waring et al., 2009). The best minimum estimates for the Canadian population based on three surveys of pups conducted between 1993 and 2004 range from 125,541 to 169,064 (CVs not reported). Lacking a minimum estimate for gray seals in U.S. waters, no PBR has been calculated.

From 2002 through 2006, the total estimated human-caused mortality and serious injury to gray seals was 836 per year (Waring et al., 2009). This average includes observed fishery interactions (331 [CV=0.21]), documented strandings with signs of non-fishery related

human interactions (2), and 2002 – 2006 average Canadian kill numbers (503). Between 2002 and 2006, the estimated level of mortality and serious injury of gray seals in the northeast sink gillnet fishery was 314 gray seals per year (CV=0.22). In the Mid-Atlantic gillnet fishery the estimate was 17 gray seal (CV=0.92) injuries or mortalities each year for this time period (Waring et al., 2009). Some lethal takes have also been documented in bottom trawl fisheries.

Although a population estimate and associated PBR have not been calculated for the North Atlantic stock of gray seals, the total U.S. fishery-related mortality and serious injury for this stock is low relative to the stock size in Canadian and U.S. waters and can be considered insignificant and approaching ZMRG. The level of human-caused mortality and serious injury in the U.S. Atlantic EEZ is unknown, but believed to be very low relative to the total stock size; therefore, this is not a strategic stock (Waring et al., 2009).

**Harp Seal** (*Pagophilus groenlandicus*)

The Western North Atlantic stock of harp seals is believed to originate from the breeding grounds off eastern Canada (Waring et al., 2009). Since the early 1990s, increasing numbers of harp seals were documented stranded on U.S. east coast beaches from Maine to New Jersey. The increased occurrence in U.S. waters is thought to reflect changes in environmental conditions affecting the pack ice upon which ice seals breed, rather than an increase in the harp seal population, which appears to have leveled off after increases in pups were documented in the 1990s. Although a minimum population of 5.3 million seals has been estimated based on 2004 pup counts, data are insufficient to calculate the minimum population estimate for U.S. waters. No PBR has been calculated for the Western North Atlantic stock of harp seals in U.S. waters (Waring et al., 2009).

The total estimated annual human-caused mortality and serious injury to harp seals between 2002 and 2006 is 443,299 (Waring et al., 2009). This is derived from three components: 1) an annual average catch of 443,216 seals from 2002-2006 in Canada by hunting and incidental bycatch ; 2) 80 harp seals (CV=0.31) taken incidentally in the U.S. Northeast sink gillnet fishery; and 3) three non-fishery related, human interaction stranding mortalities (NMFS, unpublished data). The current level of estimated bycatch in the Northeast sink gillnet fishery is similar to the average of 75 harp seals documented taken between 1994 and 1998 (Waring et al., 2000), prior to implementation of the HPTRP. Recent takes occurred primarily from January through April, between Gloucester, Massachusetts and New Hampshire (Waring et al., 2009), within the Mid-Coast Management Area and the season in which pingers are currently required. These observations suggest pingers do not affect harp seal bycatch rates.

**Hooded Seal** (*Cystophora cristata)*

The western North Atlantic stock of hooded seals originates on the breeding grounds of eastern Canada and migrates as far south as Puerto Rico (Waring et al., 2007a). In recent years, numbers of sightings and strandings have been increasing during January through May in New England, and during summer and autumn south of New England and in the

Caribbean. Although the population size as derived from pup production is relatively well known, (best minimum estimate of 512,000 from 2005 surveys), the number of hooded seals in U.S. water is unknown. Similarly, although a total PBR of 15,360 has been calculated for the population as a whole, the U.S. portion of the PBR has not been identified (Waring et al., 2007a).

The total estimated human-caused mortality and serious injury to hooded seals was 5,199 for the period between 2001 and 2005 (Waring et al., 2007a). This is derived from three components: 1) an average directed catch of approximately 5,173 hooded seals from 2001-2005 in Canada and Greenland (ICES, 2006); 2) mean annual mortality of 25 hooded seals (CV=0.82) from the Northeast sink gillnet fishery (Waring et al., 2007a); and 3) an average of one hooded seal from non-fishery related, human interaction stranding mortalities reported between 2001 and 2005 (NMFS, unpublished data). Note that there is considerable intermixing between the Northwest Atlantic and West Ice stocks, so it is possible that Northwest Atlantic seals are also taken by Greenland sealers. No hooded seals were taken in most years in the five years before the HPTRP was implemented, although 28 were estimated to have been taken by the Northeast sink gillnet fishery in 1995 (Waring et al., 2007a). Given the variability in abundance of hooded seals in past years, any changes in the interaction between gillnet fisheries and hooded seals caused by implementation of the HPTRP cannot be detected.

#### 3.2.2.2 Sea Turtles

Kemp's ridley, loggerhead, leatherback, green, and hawksbill sea turtles occur in the Mid-Atlantic waters affected by the HPTRP, though generally during warm water months when the restrictions of the HPTRP are not in place. A sea turtle take by Northeast sink gillnet fisheries has not been documented since 1995.

Loggerhead and Kemp's ridley turtles move into the waters of the Mid-Atlantic when sea surface temperatures reach 11° C (52° F). Generally, in southern North Carolina, these sea surface temperatures occur intermittently in winter months if tongues of warm Gulf Stream waters are pushed against the coast. Northern North Carolina and Virginia waters warm up more slowly, generally reaching 11° C in April. During the cool water months when harbor porpoises occur in the Mid-Atlantic and the measures of the HPTRP are in place (January through April), sea turtles and their interactions with the Mid-Atlantic gillnet fishery are rare.

Loggerhead and Kemp's ridley sea turtle bycatch has been observed in the Mid-Atlantic gillnet fishery during the months that provisions of the HPTRP are in effect. However, as Table 3-6 shows, no takes have been observed between January and April since 2001. Temporary rules to prevent sea turtle takes in Mid Atlantic gillnets were implemented prior to 2002, however seasonally adjusted closures of portions of the Mid-Atlantic Exclusive Economic Zone (EEZ) offshore of Virginia and North Carolina to large mesh gillnets have been in place in some form since an interim final rule (67 FR 13098) was effective March 15, 2002.

**Table 3-6: Observed Sea Turtle Bycatch 1995 – 2006 in Mid-Atlantic Gillnet Fishery (all mesh sizes) from January – April**

| Year | Month/Day | Management Area | Species | Mesh size |
|---|---|---|---|---|
| 1996 | 03/05 | Southern Mid-Atlantic (off NC) | 2 loggerheads | 12” |
| 1998 | 03/30 | Southern Mid-Atlantic (off NC) | 1 loggerhead | 12” |
| | 04/26 | Southern Mid-Atlantic (off NC) | 1 Kemp’s ridley | n/a |
| 1999 | 03/20 | Southern Mid-Atlantic (off NC) | 5 loggerheads<br>1 Kemp’s ridley | 12” |
| | 03/21 | Southern Mid-Atlantic (off NC) | 4 loggerheads | 12” |
| 2000 | 02/25 | Southern Mid-Atlantic (off NC) | 1 loggerhead | 6” |
| | 03/02 | Southern Mid-Atlantic (off NC) | 2 loggerheads<br>1 Kemp’s ridley | 6” |
| | 03/25 | Southern Mid-Atlantic (off NC) | 1 Kemp’s ridley | 5.8” |
| 2001 | 04/24 | Southern Mid-Atlantic (off NC) | 1 loggerhead | 12” |

Source: Unpublished NMFS observer data

**Kemp's Ridley Sea Turtle** (*Lepidochelys kempii*)

Sixty years ago, Kemp’s ridleys were abundant in the Gulf of Mexico with an estimated 42,000 females nesting during one day on Rancho Nuevo, the species' primary nesting beach along the northeastern coast of Mexico (Hildebrand, 1963). The population crash that occurred between 1947 and the early 1970’s was thought to have resulted primarily from both intensive annual harvest of the eggs and mortality of juveniles and adults in trawl fisheries (National Research Council, 1990). Although the Kemp's ridley was listed as endangered under the ESA on December 2, 1970 and received protection from international trade, only 200 Kemp’s ridley females nested annually between the years of 1978 and 1991.

Nesting has increased steadily over the past decade. The five year status review on Kemp’s ridleys conducted in 2007 reports that during the 2000 nesting season, an estimated 2,000 females nested at Rancho Nuevo, a single arribada of 1,000 turtles was reported in 2001, and an estimated 3,600 turtles produced over 8,000 nests in 2003 (NMFS and USFWS, 2007). In 2006, a record number of nests were recorded since monitoring began in 1978; 12,143 nests were documented in Mexico, with 7,866 of those at Rancho Nuevo (NMFS and USFWS, 2007). A period of steady increase in benthic immature ridleys, and ultimately in nesting females, has been observed since 1990 and appears to be from increased hatchling production and protection, and an increase in survival rates of immature sea turtles due to the use of turtle TED in shrimp trawls both in the U.S. and Mexico. One population model projected that Kemp’s ridleys could reach the Kemp’s Ridley Recovery Plan’s intermediate recovery goal of 10,000 nesters annually by the year 2015 (Turtle Expert Working Group, 2000).

Kemp's ridleys occur primarily in coastal areas of the Gulf of Mexico and the northwestern Atlantic Ocean. Occasionally individuals reach European waters (Brongersma, 1972). Adults of this species are usually confined to the Gulf of Mexico, although adult-sized individuals sometimes are found on the east coast of the United States. Benthic immature Kemp's ridleys are found along the east coast of the United States and in the Gulf of Mexico. Atlantic benthic immature sea turtles travel northward as the water warms to feed in the productive, coastal waters off Georgia through New England, returning southward with the onset of winter (Lutcavage and Musick, 1985; Henwood and Ogren, 1987; Ogren, 1989). Studies have shown the post-hatchling pelagic stage varies from 1-4 or more years, and the benthic immature stage lasts 7-9 years (Schmid and Witzell, 1997). Age at maturity is estimated to occur between 7 and 15 years (Turtle Expert Working Group, 1998).

An estimated 500 to 5,000 immature and adult Kemp's ridley mortalities were attributed to shrimp trawling prior to the implementation of TED regulations (National Research Council, 1990). Even with the implementation of TEDs, NMFS continues to attribute incidental capture in fishing gear, primarily in shrimp trawls, but also in gillnets, longlines, traps and pots, and dredges in the Gulf of Mexico and North Atlantic as the greatest cause of decline and the continuing primary threat to Kemp's ridleys. Other significant threats facing Kemp's ridleys include degradation of nesting beach habitat from human development; marine pollution and floating debris, and offshore oil and gas exploration operations. Table 3-6 shows no discernible change in the incidental capture of Kemp's ridleys before and after HPTRP implementation (1999) during the season that HPTRP requirements are in place. A clear reduction in sea turtle takes after large mesh gillnet restrictions designed to protect sea turtles were implemented in the EEZ in 2002 can be seen, however. As described above, the HPTRP management measures in the Mid-Atlantic are in effect from January through April when Kemp's ridley sea turtles generally are not present in the area until the end of this period; therefore, it is unlikely that Kemp's ridley turtles will be affected by the HPTRP.

**Loggerhead Sea Turtle** (*Caretta caretta*)

Loggerheads, the most abundant species of sea turtle, were nonetheless listed as a threatened species on July 28, 1978. This species inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans, and within the continental United States it nests from Louisiana to Virginia. The major nesting areas include coastal islands of Georgia, South Carolina, and North Carolina, and the Atlantic and Gulf coasts of Florida, with the bulk of the nesting occurring on the Atlantic coast of Florida. The pelagic waters of the North Atlantic and the Mediterranean Sea provide development habitat for small juveniles (NMFS and USFWS, 1991).

There are five western Atlantic subpopulations, divided geographically as follows: (1) a northern nesting subpopulation, occurring from North Carolina to northeast Florida at about 29° 00' N latitude; (2) a south Florida nesting subpopulation, occurring from 29° 00' N latitude on the east coast to Sarasota on the west coast; (3) a Florida Panhandle nesting subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida; (4) a Yucatán nesting subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Márquez, 1990; Turtle

Expert Working Group, 2000); and (5) a Dry Tortugas nesting subpopulation, occurring in the islands of the Dry Tortugas, near Key West, Florida (NMFS SEFSC, 2001). These subpopulations can be differentiated from each other due to the fidelity of nesting females to their nesting beaches.

Generally, loggerhead sea turtles originating from the western Atlantic nesting aggregations are thought to lead a pelagic existence in the North Atlantic Gyre for as long as 7-12 years or more. During this period, loggerheads are omnivorous and forage on crabs, mollusks, jellyfish, and vegetation at or near the surface (Dodd, 1982). Sub-adult and adult loggerheads are primarily coastal and typically prey on benthic invertebrates such as mollusks and decapod crustaceans in hard bottom habitats. Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm (15.7-23.6 inches) straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic and Gulf of Mexico. Benthic immature loggerheads (sea turtles that have come back to inshore and near shore waters), the life stage following the pelagic immature stage, were found from Cape Cod, Massachusetts, to southern Texas, and occasionally strand on beaches in northeastern Mexico.

The latest and most extensive stock assessment (NMFS SEFSC, 2001) assembled the best available information on loggerhead sea turtle life history and developed population models that can be used to predict the response of the loggerhead populations to changes in their mortality and survival. The new TED rule (68 FR 8456, February 21, 2003) requiring larger openings is expected to reduce trawl related loggerhead mortality by 94 % (Epperly et al., 2003). Based on the loggerhead population models in NMFS SEFSC (2001), this change in the mortality rate is expected to move the northern nesting population from its stable status to an increasing status.

The southeast U.S. nesting aggregation is second in size only to the nesting aggregation on islands in the Arabian Sea off Oman (Ross and Barwani, 1982; Ehrhart, 1989; NMFS and USFWS, 1991). The southeast U.S. nesting aggregation is especially important because the status of the Oman colony, which is located in an area of the world where it is highly vulnerable to disruptive events such as political upheavals, wars, catastrophic oil spills, and lack of strong protections, has not been evaluated recently (Meylan et al., 1995).

Ongoing threats to the western Atlantic populations include incidental takes from dredging, commercial trawling, longline fisheries, and gillnet fisheries; loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; vessel strikes; and disease. Table 3-6, above, shows no discernible difference in the likelihood of takes of loggerheads in gillnets in the years following implementation of the HPTRP measures were implemented in 1999 until the sea turtle gillnet restrictions went into effect in 2002. Additionally, as described above, the HPTRP requirements in the Mid-Atlantic are in effect from January through April when loggerhead sea turtles generally are not present in the area until the end of this period; therefore, it is unlikely that loggerhead turtles will be affected by the HPTRP.

### 3.2.2.3 Protected Fish

Two listed species of fish, Atlantic salmon and shortnose sturgeon, occur in the GOM and Mid-Atlantic waters. However, there are no data suggesting they interact with the gillnet fisheries managed under the HPTRP. Atlantic sturgeon, a candidate species that will likely be proposed for listing as threatened during late 2008 or early 2009, may be adversely affected by current fishing practices supported by the existing HPTRP measures and is therefore discussed with some detail below.

**Atlantic Sturgeon** *(Acipenser oxyrinchus oxyrinchus)*

Much of the information used in this section is paraphrased from the Status Review of Atlantic Sturgeon (Atlantic Sturgeon Review Team, 2007).

A 2005 Atlantic Sturgeon Status Review Team determined that Atlantic sturgeon populations should be divided into five distinct population segments (DPSs). The five DPSs were named: 1) GOM, 2) New York Bight, 3) Chesapeake Bay, 4) Carolina, and 5) South Atlantic. These populations are markedly separated based on physical, genetic, and physiological factors; are located in a unique ecological setting; have unique genetic characteristics; and extinction of any one of them would represent a significant gap in the range of the taxon. Additionally, the Team determined that three of these five DPSs (Carolina, Chesapeake, and New York Bight) were likely (> 50% chance) to become endangered in the foreseeable future (20 years). Therefore, the Status Review Team recommended that these three DPSs should be listed as threatened under the ESA. NMFS anticipates publishing a listing determination for three DPSs in the Northeast Region by the end of 2008.

During the summer of 2007, the Atlantic States Marine Fisheries Commission's Atlantic Sturgeon Technical Committee (Committee) prepared a bycatch report evaluating data from the Northeast Fisheries Science Center Observer Program. In the report, Stein et al. (2004a) identified a high bycatch rate of Atlantic sturgeon in sink gillnets in spring, and again in the late fall in the Waters off New Jersey. The elevated spring bycatch rates coincide with the HPTRT management season, when gear restrictions are required in the Waters of New Jersey and Southern Mid-Atlantic Management Areas. Among the conclusions of the Committee was the determination that mortality rates in the 12 inch (30.5 cm) mesh nets was significantly higher than mortality rates observed in other large mesh gillnets. The Committee identified the possibility that tie-downs, observed in 98% of the 12 inch (30.5 cm) mesh nets, may have contributed to the increased mortality rates observed in this gear. Long soak times that are common in the monkfish fishery may also have contributed to increased mortality rates of Atlantic sturgeon in large mesh sink gillnets. Further work is needed to determine the contribution of tie-downs and soak times to Atlantic sturgeon mortality rates.

Stein et al. (2004b) illustrates the location of the fishery interactions with Atlantic sturgeon. The existing and proposed Mudhole Management Areas seem to coincide with an area of high bycatch of Atlantic Sturgeon in the Mid-Atlantic. The effort reduction measures (limits in net length and number) and the one month closure (February 15 through March 15) in the Mudhole

North Management Area may be beneficial to Atlantic sturgeon. The proposed extension of these measures to the Mudhole South Management Area may provide reductions in Atlantic sturgeon bycatch in the monkfish fishery.

## 3.3 Fishing Community

### 3.3.1 Fishery Descriptions

All U.S. gillnet fisheries in the Northeast Region (NER) and North Carolina capable of taking harbor porpoises are affected by the HPTRP. These are described as the Northeast gillnet fishery prosecuted primarily in New England and the Mid-Atlantic gillnet fishery. Section 118 of the MMPA requires NMFS to place all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals occurring in each fishery (16 U.S.C. 1387(c)(1)). Both the Northeast sink gillnet and Mid-Atlantic gillnet fisheries are listed as Category I fisheries on the most recent (2008) List of Fisheries (72 FR 66048, November 27, 2007). As discussed above, Category I fisheries are those for which annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50 percent of the PBR level. The Northeast anchored float and drift gillnet fisheries, which make up less than 1% of the Northeast gillnet fishery (Waring et al., 2007a), are listed as Category II fisheries (annual mortality and serious injury of a stock in a given fishery is greater than 1 percent and less than 50 percent of the PBR level).

Although there were approximately 2,850 state and Federal permit holders authorized to participate in the Northeast gillnet fishery in 2006 (Waring et al., 2007a), just over 500 vessels landed fish caught by gillnets in New England ports during 2006 (Table 3-7). The Northeast gillnet fishery operates in waters off of Maine, south to the 40º 00' N latitude line and east of 72° 30' W longitude out to the eastern edge of the EEZ. These waters include the GOM, Georges Bank, and Southern New England, and exclude Long Island Sound and other inshore waters.[2] The following description of the fishery as discussed in this EA is taken in part from the 2007 List of Fisheries (72 FR 14466, March 28, 2007). Fishing effort occurs year-round, peaking from May to July primarily on continental shelf regions in depths from 30–750 ft (9–228.6 m), with some nets set deeper than 800 ft (244 m). Target species for this fishery include a complex of groundfish: Atlantic cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, spiny dogfish, monkfish, silver hake, red hake, white hake, ocean pout, mackerel, redfish, shad, and a number of skate species. The Northeast gillnet fishery uses primarily sink gillnet gear, which is anchored gillnet (bottom-tending net) fished in the lower one-third of the water column. The dominant material is monofilament twine with stretched mesh sizes from 6–12 inches (15–30.5 cm) and string lengths from 600–10,500 ft (183–3,200 m), depending on the target species. As described more fully in Section 4.3, this fishery is managed by the Northeast Multispecies (Groundfish) FMP and the Monkfish FMP, as well as the ALWTRP and the HPTRP. Management mechanisms include Total Allowable Catch (TAC) limits, individual trip limits (quotas), effort caps (limited number of days at sea per vessel), time and area closures, and gear restrictions.

[2] Note that in the analysis of the economic impacts of the alternatives provided in Section 4.2, internal waters (i.e., inside the 72 COLREGS lines) were excluded from the analysis for the states of Virginia and North Carolina only.

The Mid-Atlantic gillnet fishery, as discussed in this EA, includes a number of opportunistic small vessels operating seasonally to target fish migrating north or south through coastal waters, as well as large vessels including gillnet fishermen from New England targeting monkfish and other species in the waters off New Jersey and Maryland. Over 7,000 State and Federal permits were issued to vessels capable of harvesting fish with gillnets in the Mid-Atlantic in 2006 (Waring et al., 2007a), although, as Table 3-7 shows, fewer than 700 vessels that landed fish in Mid-Atlantic ports used gillnets. The fishery operates year-round west of a line drawn at 72° 30' W longitude from Long Island south to the North Carolina/South Carolina border, not including inshore bays, estuaries, and rivers. The following description is taken from Waring et al. (2007a). The Mid-Atlantic gillnet fishery targets monkfish, spiny dogfish, smooth dogfish, bluefish, weakfish, menhaden, spot, croaker, striped bass, large and small coastal sharks, Spanish mackerel, king mackerel, American shad, black drum, a number of skate species, yellow perch, white perch, herring, scup, kingfish, spotted sea trout, and butterfish. The fishery uses drift and sink gillnets, including nets set in a sink, stab, set, strike, or drift fashion, with some unanchored drift or sink nets used to target specific species.[3] The dominant material is monofilament twine with stretched mesh sizes from 2.5–12 inches (6.4–30.5 cm), and string lengths from 150–8,400 ft (46–2,560 m). The fishery includes residual large pelagic driftnet effort in the Mid-Atlantic, and shark and dogfish gillnet effort. Fishing occurs from right off the beach and in nearshore coastal waters out to deeper offshore waters. Gear in this fishery is managed by several Federal FMPs and Inter-State FMPs managed by the ASMFC, as well as the ALWTRP, the HPTRP, and the BDTRP. Fisheries are primarily managed by TACs, individual trip limits (quotas), effort caps (limited number of days at sea per vessel), time and area closures, and gear restrictions and modifications.

### 3.3.2 Fishing Communities/Economics of Port Groups

The principle data sources used to examine the Northeast and Mid-Atlantic gillnet fisheries include the NMFS Northeast Fisheries Science Center (NEFSC) dealer database, the NMFS Northeast Regional Office (NERO) permit database, the VMRC trip data, and North Carolina Department of Marine Fisheries (NCDMF) trip data. For the analyses found here, the communities are identified as port groups based on the port in which vessels landed fish, similar to the method described in Bisack (1997) and used in harbor porpoise bycatch analysis. Modifications include aggregating northern and southern Maine ports and grouping Maryland and Delaware ports, for confidentiality reasons. The port groups largely correspond to state boundaries, except for the groups North of Boston (NB), South of Boston (SB), East of Cape Cod (ECC), and South of Cape Cod (SCC). The SCC group includes Rhode Island and Connecticut, as well as ports on the south shore of Massachusetts.

The Northeast and Mid-Atlantic gillnet fisheries are large. However, their importance relative to overall commercial fishing effort varies by port group and measure. For all port groups except ECC, the percentage of gillnet vessels suggests a larger fishery than indicated by those vessels' contribution to either landings or revenues (Table 3-7). On average between 2002 and 2006, gillnet vessels accounted for between 9% (ECC) and 29% (NB) of vessels landing in an area. Over the NER as a whole, excluding North Carolina, approximately 17% of the commercial fleet

[3] Note that for the analysis conducted on the economic impacts of the alternatives (Section 4.2), only sink and anchored gillnets were included.

used gillnet gear at least some of the time. In contrast, for all port groups (including NC), gillnet vessels have accounted for an average of only 3% of live weight landings and 4% of the revenues. Gillnet vessels accounted for the greatest share of landings in ECC (29%), New Hampshire (20%), and North Carolina (14%). The contribution of gillnet vessels to total revenue was highest in New Hampshire (19%), ECC (18%), and NB (14%). In summary, the gillnet fleet is highly represented in terms of vessel numbers throughout NER; however, in terms of landings and revenues it is much more important to ports in New England.

The number of vessels landing fish in a port group increased or stayed the same for four port groups and declined for seven groups (Table 3-7). The ECC group had the largest increase (+62%), while New York had the largest decrease (-41%). The number of gillnet vessels in Virginia and North Carolina dwarfs that in other port groups. However, many of these vessels fish only in inland waters and so would not be subject to HPTRP regulations. In Virginia, about 12% of the gillnet vessels fished in ocean-side waters (state and federal), while in North Carolina about 29% did so. These are identified as the "potentially affected" vessels in Table 3-7. Table 3-8 depicts by port group the percentage of Northeast fisheries vessels that are attributed as gillnet, as well as the percentage of live weight landings and values accounted for by gillnet vessels operating in Northeast fisheries between 2002 and 2006.

**Table 3-7: Number of vessels using sink or anchored gillnet gear to land seafood in a given port group. In Virginia and North Carolina, "potentially affected" vessels include only those vessels that fish outside of the 72 COLREGS lines.**

| | | | | | | 2002 - 2006 | |
|---|---|---|---|---|---|---|---|
| | 2002 | 2003 | 2004 | 2005 | 2006 | Avg | Change |
| Maine | 57 | 40 | 42 | 88 | 55 | 56 | -4% |
| New Hampshire | 57 | 51 | 60 | 41 | 41 | 50 | -28% |
| North of Boston | 120 | 161 | 199 | 192 | 127 | 160 | +6% |
| South of Boston | 45 | 45 | 38 | 42 | 42 | 42 | -7% |
| East of Cape Cod | 37 | 36 | 46 | 42 | 60 | 44 | +62% |
| South of Cape Cod | 137 | 134 | 163 | 164 | 141 | 148 | +3% |
| New York | 94 | 90 | 43 | 59 | 55 | 68 | -41% |
| New Jersey | 98 | 96 | 100 | 122 | 91 | 101 | -7% |
| Delaware/Maryland | 20 | 18 | 6 | 19 | 20 | 17 | 0% |
| Virginia | | | | | | | |
| *All gillnet* | n/a | 485 | 490 | 494 | 463 | 483[b] | -5%[b] |
| *Potentially affected* | n/a | 59 | 62 | 61 | 59 | 60[b] | 0%[b] |
| North Carolina | | | | | | | |
| *All gillnet* | 1,835 | 1,807 | 1,713 | 1,578 | 1,478 | 1,520 | -19% |
| *Potentially affected* | 409 | 411 | 521 | 474 | 332 | 437 | -19% |
| Total Unique Vessels[a] | | | | | | | |
| *All gillnets* | n/a | 2,883 | 2,820 | 2,746 | 2,500 | 2,737[b] | -13%[b] |
| *Potentially affected* | n/a | 1,061 | 1,200 | 1,209 | 975 | 1,111[b] | -8%[b] |

[a] Vessels may fish in multiple ports, so the sum of vessels by port group exceeds the total.

[b] For the Virginia port group and Total Unique Vessels, the average and change values only include 2003 – 2006.

Source: NMFS dealer database, Virginia Marine Resources Commission trip data, North Carolina Division of Marine Fisheries trip data

**Table 3-8: Percentage of Northeast fisheries vessels, live weight landings and value accounted for by gillnet vessels, by port group, average for 2002-2006**

| | Average between 2002-06 % of total that were gillnet | | |
|---|---|---|---|
| | vessels | landings | revenues |
| Maine | 11 | 2 | 1 |
| New Hampshire | 28 | 20 | 19 |
| North of Boston | 29 | 7 | 14 |
| South of Boston | 11 | 5 | 4 |
| East of Cape Cod | 9 | 29 | 18 |
| South of Cape Cod [a] | 14 | 2 | 2 |
| New York | 17 | 2 | 4 |
| New Jersey | 22 | 1 | 5 |
| Delaware & Maryland | 23 | 1 | 1 |
| Virginia | 15 [b] | 2 [b] | 5 [b] |
| North Carolina | N/A | 14 | 11 |
| Average from all ports (Maine to North Carolina) | 17 [c] | 3 | 4 |

[a] South of Cape Cod includes Rhode Island and Connecticut, as well as the south shore of Massachusetts.
[b] Average values for the Virginia port group only include 2003 – 2006.
[c] Excludes North Carolina.
Sources: NMFS dealer database, Virginia Marine Resources Commission trip data, North Carolina Division of Marine Fisheries trip data

Vessels may land fish in multiple ports, and there are multiple ways to allocate vessels to a single port. For this analysis, vessels were allocated based on the port with the highest share of each vessel's annual revenues (Table 3-9); this does not include Virginia or North Carolina, as vessels could not be tracked between the different databases. For most port groups, the number of vessels that landed fish (Table 3-7) is similar to the number that generated the majority of their revenues from that port group (Table 3-9). Notable exceptions are NH, SB, and SCC. In all cases, a substantial number of vessels from other ports also use these ports (i.e., number of vessels in Table 3-7 is greater than number of vessels in Table 3-9). The reasons for this difference are not known, but could be due to port-based features, the location of specific fishing grounds adjacent to these ports, or some other economic, biological, or social factors.

**Table 3-9: Number of gillnet vessels by principle port, based on port with highest portion of annual revenues**

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2002 - 2006 Avg | 2002 - 2006 Change |
|---|---|---|---|---|---|---|---|
| Maine | 55 | 37 | 42 | 88 | 55 | 55 | 0% |
| New Hampshire | 37 | 36 | 44 | 31 | 34 | 36 | -8% |
| North of Boston | 116 | 155 | 209 | 192 | 122 | 159 | 5% |
| South of Boston | 34 | 31 | 21 | 25 | 28 | 28 | -18% |
| East of Cape Cod | 37 | 36 | 46 | 42 | 59 | 44 | 59% |
| South of Cape Cod | 96 | 91 | 114 | 107 | 100 | 102 | 4% |
| New York | 97 | 95 | 43 | 55 | 54 | 69 | -44% |
| New Jersey | 86 | 92 | 92 | 117 | 88 | 95 | 2% |
| Delaware/Maryland | 20 | 18 | 6 | 17 | 19 | 16 | -5% |
| Virginia [a] | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| North Carolina [a] | n/a | n/a | n/a | n/a | n/a | n/a | n/a |

[a] Due to differences in the data, values for Virginia or North Carolina could not be calculated.
Source: NMFS dealer database

Based on a five-year average of landings, the top five port groups for gillnets in the area affected by the HPTRP are North Carolina, SCC, Virginia, NB, and New Jersey (Table 3-10). Live weight landings by the gillnet fleet in the NER and North Carolina rose between 2002 and 2004 but then declined, for an overall decrease of almost 9% from 2002 to 2006. The change in landings has not been uniform. Landings increased in ECC, NJ, and Delaware/Maryland, but decreased for all other port groups.

**Table 3-10: Total live weight landings (mtons) by port group for gillnet vessels**

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2002 - 2006 Avg | 2002 - 2006 Change |
|---|---|---|---|---|---|---|---|
| Maine | 1,568 | 1,868 | 1,833 | 2,445 | 1,378 | 1,818 | -12% |
| New Hampshire | 1,935 | 1,600 | 1,720 | 1,963 | 1,543 | 1,752 | -20% |
| North of Boston | 3,565 | 4,296 | 3,823 | 3,242 | 3,254 | 3,636 | -9% |
| South of Boston | 1,151 | 932 | 680 | 518 | 439 | 744 | -62% |
| East of Cape Cod | 2,649 | 3,407 | 2,316 | 2,530 | 4,359 | 3,052 | +65% |
| South of Cape Cod | 4,405 | 5,738 | 9,368 | 3,706 | 3,873 | 5,418 | -12% |
| New York | 1,210 | 1,401 | 695 | 1,105 | 908 | 1,064 | -25% |
| New Jersey | 3,112 | 3,517 | 3,097 | 3,846 | 3,282 | 3,371 | +5% |
| Delaware/Maryland | 229 | 345 | 206 | 445 | 337 | 312 | +47% |
| Virginia [a] | 4,518 | 5,243 | 5,735 | 5,246 | 3,903 | 4,929 | -14% |
| North Carolina [a] | 7,240 | 7,265 | 7,250 | 6,318 | 5,285 | 6,672 | -27% |
| Total | 31,723 | 35,818 | 36,887 | 31,523 | 28,727 | 32,936 | -9% |

[a] Includes all gillnet landings.
Sources: NMFS dealer database, North Carolina Division of Marine Fisheries

From 2002 to 2006, total revenues for the gillnet fleet (in constant 2002 dollars[4]) decreased by 47% for the Northeast as a whole (Table 3-11). While port groups in New England had some of

[4] Nominal or reported values were adjusted using Bureau of Labor Statistics, Producer Price Index for series WPU0022301.

the largest declines in total revenues, all ports had a decrease. The decrease in landings discussed above (Table 3-10) may explain some of the loss in value; however, there has also been a substantial decrease in the average value per metric ton for landings (Table 3-12). This appears to be the result of a decline in constant dollar prices for many key species (e.g., cod, haddock, pollock, and monkfish) and a shift in catch composition away from higher value species.

**Table 3-11: Total revenues (in thousands of constant 2002 dollars) by port group for gillnet gear**

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2002 - 2006 Avg | 2002 - 2006 Change |
|---|---|---|---|---|---|---|---|
| Maine | 2,857 | 2,572 | 2,469 | 2,983 | 1,261 | 2,428 | -56% |
| New Hampshire | 3,817 | 2,572 | 2,747 | 2,917 | 1,424 | 2,695 | -63% |
| North of Boston | 7,715 | 8,000 | 6,622 | 4,906 | 3,752 | 6,199 | -51% |
| South of Boston | 1,816 | 1,850 | 1,308 | 888 | 589 | 1,290 | -68% |
| East of Cape Cod | 4,200 | 4,127 | 1,815 | 2,029 | 2,793 | 2,993 | -33% |
| South of Cape Cod | 7,354 | 6,979 | 5,853 | 5,550 | 3,950 | 5,937 | -46% |
| New York | 1,906 | 2,140 | 912 | 1,816 | 959 | 1,546 | -50% |
| New Jersey | 6,030 | 6,148 | 4,004 | 5,766 | 3,477 | 5,085 | -42% |
| Delaware/Maryland | 461 | 633 | 494 | 787 | 448 | 565 | -3% |
| Virginia [a] | 5,326 | 5,957 | 6,204 | 6,617 | 3,464 | 5,514 | -35% |
| North Carolina [a] | 8,968 | 7,966 | 7,033 | 5,978 | 4,705 | 6,930 | -48% |
| Total | 50,449 | 48,944 | 39,461 | 40,237 | 26,822 | 41,183 | -47% |
| Producer Price Index | 1.000 | 0.972 | 1.112 | 1.256 | 1.661 | | |

[a] Includes all gillnet revenues.

Source: NMFS dealer database, North Carolina Division of Marine Fisheries, Bureau of Labor Statistics, series WPU0022301.

**Table 3-12: Average price per metric ton (in constant 2002 dollars) by port group, for landings by gillnet gear**

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2002 - 2006 Change |
|---|---|---|---|---|---|---|
| Maine | 1,822 | 1,377 | 1,347 | 1,220 | 915 | -50% |
| New Hampshire | 1,972 | 1,607 | 1,597 | 1,486 | 923 | -53% |
| North of Boston | 2,164 | 1,862 | 1,732 | 1,513 | 1,153 | -47% |
| South of Boston | 1,577 | 1,986 | 1,923 | 1,713 | 1,341 | -15% |
| East of Cape Cod | 1,585 | 1,211 | 784 | 802 | 641 | -60% |
| South of Cape Cod | 1,669 | 1,216 | 625 | 1,498 | 1,020 | -39% |
| New York | 1,575 | 1,527 | 1,312 | 1,643 | 1,056 | -33% |
| New Jersey | 1,938 | 1,748 | 1,293 | 1,499 | 1,059 | -45% |
| Delaware/Maryland | 2,013 | 1,834 | 2,398 | 1,769 | 1,329 | -34% |
| Virginia [a] | 1,179 | 1,136 | 1,082 | 1,261 | 888 | -25% |
| North Carolina [a] | 1,239 | 1,096 | 970 | 946 | 890 | -28% |
| Total | 1,590 | 1,366 | 1,070 | 1,276 | 934 | -41% |
| Producer Price Index | 1.000 | 0.972 | 1.112 | 1.256 | 1.661 | |

[a] Includes all gillnet revenues.

Source: NMFS dealer database, North Carolina Division of Marine Fisheries, Bureau of Labor Statistics, series WPU0022301.

Gillnet gear is a valid gear type for all federally managed fisheries except ocean quahogs and surf clams, and the gear lands a range of managed species. The importance of individual species varies by port group, and on whether measure shares are measured by value (Table 3-13) or weight (Table 3-14). In general, high volume species such as hake and skates have lower prices resulting in a lower percentage of the total value. Monkfish is the only species that accounts for a significant share of value and landings in all port groups; this percentage increases from Maine to SCC and then decreases for port groups further south. The species in the Multispecies FMP complex provide a considerable share of revenues for ports from ECC and north, accounting for 45% of revenues in ECC and increasing to 89% in Maine. Generally, the higher the dependence a port has on a species, the greater the impact on that port from regulatory changes such as changes to the Multispecies FMP.

**Table 3-13: Average (2002-2006) distribution of monetary value within a port group by species**

| | ME | NH | NB | SB | ECC | SCC | NY | NJ | DE/ MD | VA | Ocean NC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Multispecies FMP | | | | | | | | | | | |
| Cod | 31 | 35 | 36 | 20 | 34 | 1 | | | | | |
| Haddock | 2 | 1 | 6 | 1 | 5 | | | | | | |
| Pollock | 33 | 23 | 10 | 1 | 5 | | | | | | |
| Yellowtail Flounder | | | 3 | 13 | | | | | | | |
| Witch Flounder | | | 3 | 6 | 1 | 1 | | | | | |
| Whiting | 19 | 5 | 4 | | | | | | | | |
| Others | 4 | 2 | 3 | 1 | | | 1 | | | | |
| Bluefish | | | | 2 | | | 8 | 3 | 1 | 1 | 16 |
| Croaker | | | | | | | | 4 | 2 | 17 | |
| Dogfish (spiny & smooth) | | 1 | 1 | 3 | 2 | | | 1 | | 5 | 5 |
| Fluke | | | | | | 3 | 2 | 1 | 2 | | |
| Lobster | | 1 | 6 | 16 | 4 | 2 | | | 1 | | |
| Menhaden | | | | | | | 1 | | 1 | 2 | 0 |
| Monkfish | 11 | 30 | 26 | 35 | 30 | 80 | 55 | 67 | 14 | 9 | 4 |
| Scallops | | | 1 | | 1 | 1 | 2 | 12 | 1 | | |
| Shad/River Herring | | | | | | | | 1 | 2 | 1 | 1 |
| Skates | | | 1 | 2 | 16 | 7 | 3 | 2 | | | |
| Spanish Mackerel | | | | | | | 1 | | | | 15 |
| Spot | | | | | | | | | 4 | 17 | 5 |
| Striped Bass | | | | | | | 19 | | 63 | 39 | 5 |
| Weakfish (spotted & gray) | | | | | | | 2 | 1 | 3 | 2 | 7 |
| Other regulated invertebrates | | | | | | 1 | 1 | | | | |
| Other regulated finfish | | | | | | 1 | 2 | 3 | 4 | | |
| Other | 1 | | 1 | | | | 1 | 2 | 3 | 5 | 41 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: NMFS dealer database, North Carolina Division of Marine Fisheries

**Table 3-14: Average (2002-2006) distribution of live weight landings within a port group by species**

| | ME | NH | NB | SB | ECC | SCC | NY | NJ | DE/ MD | VA | Ocean NC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Multispecies FMP | | | | | | | | | | | |
| Cod | 18 | 22 | 24 | 15 | 17 | | | | | | |
| Haddock | 1 | 1 | 4 | 1 | 2 | | | | | | |
| Pollock | 41 | 35 | 17 | 2 | 6 | | | | | | |
| Yellowtail Flounder | | | 2 | 9 | | | | | | | |
| Witch Flounder | | | 2 | 4 | | | | | | | |
| Whiting | 23 | 8 | 6 | 1 | | | | | | | |
| Others | 3 | 1 | 2 | 1 | | | 2 | | | | |
| Bluefish | | | | 3 | 1 | 1 | 16 | 7 | 4 | 2 | 26 |
| Croaker | | | | | | | | 6 | 5 | 30 | |
| Dogfish (spiny & smooth) | 1 | 5 | 8 | 13 | 4 | | 1 | 1 | 1 | 8 | 8 |
| Fluke | | | | | | 1 | 1 | 1 | 1 | | |
| Lobster | | | 1 | 3 | 1 | | | | | | |
| Menhaden | | | | | | | 4 | 2 | 11 | 4 | 1 |
| Monkfish | 11 | 27 | 26 | 34 | 16 | 50 | 45 | 54 | 15 | 5 | 2 |
| Scallops | | | 1 | | | 1 | 3 | 12 | 1 | | |
| Shad/River Herring | | | | | | | | 1 | 3 | 2 | |
| Skates | | | 3 | 13 | 52 | 31 | 16 | 8 | 1 | | |
| Spanish Mackerel | | | | | | | | | | | 5 |
| Spot | | | | | | | | | 6 | 20 | 4 |
| Striped Bass | | | | | | | 6 | | 41 | 15 | 1 |
| Weakfish (spotted & gray) | | | | | | | 2 | 1 | 3 | 1 | 4 |
| Other regulated invertebrates | | | | | | 1 | 1 | 1 | 2 | | |
| Other regulated finfish | 1 | | | | | 1 | 1 | 2 | 2 | | |
| Other | 1 | | 2 | | | | 2 | 3 | 5 | 11 | 48 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: NMFS dealer database, North Carolina Division of Marine Fisheries

# 4.0 EFFECTS OF THE MANAGEMENT ALTERNATIVES

## 4.1 Biological Effects of the Alternatives

The MMPA requires the implementation of TRPs to reduce the mortality and serious injury of strategic stocks incidentally taken in the course of U.S. commercial fishing operations to below the PBR levels established for such stocks. The current average annual human-related mortality and serious injury of harbor porpoises in Northeast and Mid-Atlantic gillnet fisheries exceeds the stock's PBR level of 610. Reduction of the incidental take of harbor porpoises by serious injury or mortality to below 610 is the primary biological objective of the alternatives considered in this EA.

### 4.1.1 Biological Effects of the Alternatives on Harbor Porpoises

For a complete description of the methods and results used to predict the bycatch of harbor porpoises expected under each of the alternatives, as paraphrased in this section, see Palka and Orphanides (2008b) in Appendix I. Note that for all of the alternatives considered, the bycatch estimate for the months and areas in which no HPTRP measures are proposed or are in effect is assumed to be the same as the average bycatch for those months observed in 2005 and 2006. The predicted bycatch rate (estimated harbor porpoise takes per observed metric tons of landings, or takes/mtons) and fishing effort (mtons of landings) is identified for HPTRP management areas for each alternative.

The predicted bycatch rates and fishing effort are multiplied together to provide the predicted total bycatch for each area. These area bycatch estimates are summed to provide the total regional bycatch estimate of each alternative. Effort data collected during 2005 and 2006 (the two most recent available years) were used to represent current average conditions, and the resulting predicted bycatch was averaged to accommodate inter-annual variability. Predicted bycatch rates are presented as a range from best case estimates ("min") of bycatch (achieved through 100% compliance with the HPTRP requirements) through worst case estimates ("max") of bycatch (under actual compliance rates observed since the HPTRP has been implemented).

As shown in Table 4-1, all of the proposed alternatives, except for Alternative 1 (No Action), result in annual harbor porpoise bycatch estimates in Northeast and Mid-Atlantic gillnet fisheries that are below PBR. Although Alternative 4 (Preferred) provides the greatest reduction in bycatch, given the data limitations and the assumptions within the bycatch estimates, the results for Alternatives 3 and 5 are similar to Alternative 4 (Preferred).

**Table 4-1: A summary of average bycatch estimates, by season and fishery (Northeast and Mid-Atlantic gillnets), under the actual conditions data were collected during 2005 and 2006 and under the average situations for each alternative as reported in Palka and Orphanides (2008b). The seasons for the Northeast (NE) fishery are winter: January through May; summer: June through August; and fall: September through December. "Min" represents the low bycatch rate that results from 100% compliance, and "max" represents the average bycatch rate after implementation of the HPTRP, incorporating both compliant and non-compliant gillnet hauls.**

| Time/Area | 2005 Actual bycatch estimates | 2006 Actual bycatch estimates | Alternative 1. Average 2005 and 2006 | Alternative 2. Closures | | Alternative 3. Pingers | | Alternative 4. Preferred. Pre-trigger time period | | Alternative 4. Preferred. Post-trigger time period with only Coastal GOM Closure Area closed | | Alternative 4. Preferred. Post-trigger time period with only SNE Closure Areas closed | | Alternative 4. Preferred. Post-trigger time period with CGOM and SNE Closure Areas closed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| Winter NE | 306 | 420 | 363 | 147 | 248 | 57 | 101 | 94 | 151 | 94 | 151 | 74 | 151 | 74 | 151 |
| Summer NE | 52 | 37 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| Fall NE | 272 | 57 | 165 | 47 | 111 | 50 | 87 | 49 | 92 | 33 | 92 | 49 | 92 | 33 | 92 |
| **NORTHEAST SUBTOTAL** | **630** | **514** | **572** | **238** | **403** | **151** | **232** | **187** | **287** | **171** | **287** | **167** | **287** | **151** | **287** |
| | | | | | | | | | | | | | | | |
| New Jersey Mid-Atlantic (January through April) | 470 | 512 | 491 | 120 | 183 | 136 | 345 | 124 | 183 | 124 | 183 | 124 | 183 | 124 | 183 |
| **GRAND TOTAL** | **1100** | **1026** | **1063** | **358** | **586** | **287** | **577** | **311** | **470** | **295** | **470** | **291** | **470** | **275** | **470** |

| Time/Area | Alternative 5. Preferred alternative plus other actions. Pre-trigger | | Alternative 5. Preferred alternative plus other actions. Post-trigger time period with CGOM and SNE Closure Areas closed | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| Winter NE | 94 | 181 | 74 | 181 |
| Summer NE | 44 | 44 | 44 | 44 |
| Fall NE | 49 | 94 | 33 | 94 |
| **NORTHEAST SUBTOTAL** | **187** | **319** | **151** | **319** |
| | | | | |
| New Jersey Mid-Atlantic (January through April) | 126 | 186 | 126 | 186 |
| **GRAND TOTAL** | **313** | **505** | **277** | **505** |

#### 4.1.1.1 Biological Effects of Alternative 1 (No Action, Status Quo)

Under Alternative 1 (No Action), the current HPTRP regulations would remain unchanged, and no additional restrictions would be implemented. The current HPTRP regulations (50 CFR 229.33-34) affect all gillnet fisheries that may take harbor porpoises in areas that coincide with harbor porpoise distribution. For a complete description of this alternative, see Section 2.2.1.

Briefly, in New England, six management areas illustrated in Figures 2-1 (termed "closure areas" in the current regulations) have been established within which pingers or closures are required seasonally throughout the year. These areas include the Northeast Closure Area, the Mid-Coast Closure Area, the Massachusetts Bay Closure Area, the Offshore Closure Area, the Cashes Ledge Closure Area, and the Cape Cod South Closure Area. Pingers must be attached at each end of the gillnet string and at the bridle of every net within a net string. To ensure that vessel operators know how to properly use pingers, operators are required to complete one-time pinger training, and must have their pinger training authorization, issued by NMFS, on board the vessel when fishing in HPTRP management areas in which pingers are required. In the Mid-Atlantic, two large management areas have been established (Waters off New Jersey and Southern Mid-Atlantic Waters, Figure 2-2) within which seasonal closures and large and small mesh gillnet gear modifications are required from January 1 through April 30. One smaller area, the Mudhole Closure Area, is located within the Waters off New Jersey and contains an additional closure and more stringent large and small mesh gear modification requirements.

Section 1.2.4 discusses the effectiveness of the HPTRP since implementation in 1999. Harbor porpoise bycatch in Northeast and Mid-Atlantic gillnet fisheries is estimated as 1,100 harbor porpoises taken in 2005 and 1,026 taken in 2006 (Table 4-1), nearly twice the annual PBR of 610 harbor porpoises. Analysis of observer data suggests the primary issues contributing to the observed increase in harbor porpoise takes in U.S. commercial fisheries include poor compliance with the existing HPTRP requirements, and increased bycatch outside of existing management areas.

If the non-regulatory components described in Section 2.1 (Non-Regulatory Components) were implemented in combination with Alternative 1 (No Action), namely increased outreach and enforcement efforts, compliance with the existing HPTRP measures would be expected to increase, as appears to be the case after NMFS conducted its outreach meetings in late 2006 and early 2007. However, according to Palka (2008), with 100% compliance with the existing HPTRP requirements, PBR (610 animals) would have been exceeded under the existing HPTRP in both 2005 and 2006, with a compliant bycatch estimate of 651 harbor porpoises for 2005 and 630 for 2006 (Appendix C). Therefore, outreach and enforcement efforts alone would not reduce harbor porpoise takes enough to achieve PBR or levels approaching ZMRG.

Should Alternative 1 (No Action) be implemented, PBR would continue to be exceeded and it is possible that the harbor porpoise population could decline. Additionally, NMFS would not be meeting its mandates under the MMPA to reduce takes to below the PBR level for this strategic stock. The long-term goal of attaining ZMRG would not be met. Even with 100% compliance with the existing HPTRP management area requirements, harbor porpoise takes would continue to occur outside of the HPTRP management areas, with take levels continuing to exceed PBR.

#### 4.1.1.2 Biological Effects of Alternative 2 (Closures)

Alternative 2 would immediately implement new closure areas, in addition to the existing measures of the HPTRP. See Section 2.2.2 for a complete description of this alternative. Three large areas (Figure 2-3) would be seasonally closed to gillnet fishing in New England waters, including the Coastal Gulf of Maine Closure Area (closed October and November), the Eastern Cape Cod Closure Area (closed February through April), and the Cape Cod South Expansion Closure Area (closed February through April). Note that these closure areas are the same as the consequence closure areas that could be implemented under Alternative 4 (Preferred) and Alternative 5 if non-compliance rates exceed the specified target bycatch rates. In addition, an area adjacent to the existing Mudhole Management Area (Figure 2-4), called the Mudhole South Management Area, would be closed to large and small mesh gillnet fishing from February 1 through March 15.

As indicated above, analysis of observer data suggests that the primary issues contributing to the observed increase in harbor porpoise takes in U.S. commercial fisheries include poor compliance with the existing HPTRP, and increased bycatch outside of existing management areas. Alternative 2 would address both of these concerns. The decline of compliance rates in the nine years since pingers were first required in the Northeast gillnet fisheries has reduced the effectiveness of the seasonal pinger requirements. The three New England closure areas encompass locations of high harbor porpoise bycatch rates during certain seasons. Immediate seasonal closure of these areas would rapidly reduce harbor porpoise takes without requiring the complex monitoring needed to determine whether pingers have been correctly deployed and adequately maintained.

The Mudhole South Management Area within the Waters off New Jersey Management Area would be closed from February 1 to March 15. This closure incorporates an area of high bycatch observed outside of current closure periods and areas. During their December 2007 meeting, the HPTRT reached full consensus, with one abstention, on the creation of the Mudhole South Management Area and this closure period. As such, this action is also included within Alternative 4 (Preferred), as well as Alternative 5.

For a complete description of the methods used to estimate harbor porpoise bycatch in Northeast and Mid-Atlantic gillnet fisheries under the closures identified within Alternative 2, see Palka and Orphanides (2008b) in Appendix I. Briefly, the following assumptions were made to identify bycatch rates that reflect bycatch rates ranging from full compliance with the proposed measures, to the average compliance rates observed under the existing HPTRP:

- Predicted bycatch rates for the three new closure areas were assumed to be zero.
- Predicted bycatch rates for the areas remaining open that are not presently managed were the bycatch rates observed during 2005 and 2006.
- Predicted bycatch rates for existing management areas not closed ranged from the bycatch rate of hauls with 100% compliance as observed during January 1, 1999 to May 31, 2007 (0.031 harbor porpoises per observed mtons of landings for the Mid-Coast and Massachusetts Bay Management Areas, 0.023 for the areas south and east of Cape Cod, and 0.203 in the New Jersey area) to the average bycatch rate of all hauls observed during

January 1, 1999 to May 31, 2007 in the management areas, irrespective of the level of compliance (0.058 harbor porpoises per observed mtons of landings for the Mid-Coast and Massachusetts Bay Management Areas, 0.041 for the areas south and east of Cape Cod, and 0.233 for the New Jersey area).

- If a stratum did not have an observed take in 2005 or 2006, then assumed bycatch rates were zero.

Effort was estimated to range from the maximum effort observed during 2005 and 2006 (assumes gillnet fishermen that had previously fished within the new closed areas would fish and catch in other areas), to ½ the landings observed for the closed areas during the seasons that the closures would be in effect (assumes gillnet fishermen that normally fish in the new closed areas are not fishing during the closure periods, which encompass about ½ of the fishing season). For the New Jersey area, the minimum effort is ¾ of the observed landings from 2005 and 2006 because the closure period consists of approximately ¼ of the observed effort in this area in the winter.

The result of multiplying the predicted bycatch rate range and the predicted effort range is a bycatch estimate range of 358 (minimum) to 586 (maximum) harbor porpoise takes annually for the closures identified under Alternative 2 (Table 4-1). Both the minimum and maximum bycatch estimates for Alternative 2 fall below the PBR level for harbor porpoises (610 animals). However, if compliance with the existing pinger requirements and new closure areas is poor, harbor porpoise bycatch would be closer to the higher estimate (586), which is only 24 animals below PBR. However, if outreach and enforcement efforts are increased through implementation of the non-regulatory components described in Section 2.1 of this EA, compliance would be expected to increase. With higher compliance, harbor porpoise bycatch would be expected to be closer to the lower end of the range, at 358 animals.

When compared to Alternative 1 (No Action), Alternative 2 would allow between 477 and 705 fewer harbor porpoises to be taken, which is a reduction of 34% to 55%. Alternative 1 does not amend the regulations and thus, all takes occurring outside of the HPTRP management areas would continue. Alternative 2 would immediately seasonally close these areas during the times of greatest observed harbor porpoise bycatch.

#### 4.1.1.3 Biological Effects of Alternative 3 (Pingers)

Alternative 3 would seasonally expand pinger requirements throughout the area and season where GOM/BOF harbor porpoise distribution overlaps the New England and Mid-Atlantic gillnet fisheries. For a complete description of this alternative, see Section 2.2.3. Pingers would be required in all areas in the GOM (except for the Northeast Closure Area, and the area east of its westernmost boundary at 68$^{o}$ 55'W longitude and north of a line intersecting this boundary at 43$^{o}$ 30'N latitude and east to the EEZ) and southern New England from September 15 through May 31 (Figure 2-5). In the Mid-Atlantic, pingers would be required for small and large mesh gillnets throughout the Waters off New Jersey and Southern Mid-Atlantic Management Areas (Figure 2-6) from January 1 through April 30. Seasonal closure periods and areas would remain in effect, including the Northeast, Cashes Ledge, Massachusetts Bay, and Cape Cod South

Closure Areas in New England, and the Mudhole (large and small mesh), Waters off New Jersey (large mesh), and Southern Mid-Atlantic (large mesh) closures in the Mid-Atlantic.

The following assumptions were made to estimate the bycatch of harbor porpoises in gillnet fisheries in the Gulf of Maine and Southern New England area during September 1 to May 31. Bycatch rates ranged from 1) the bycatch rate of hauls with 100% compliance from January 1, 1999 to May 31, 2007 (0.031 for the Gulf of Maine, 0.023 for the areas south and east of Cape Cod) to 2) the average bycatch rate of all hauls observed during January 1, 1999 to May 31, 2007 in the management areas, irrespective of the level of compliance (0.053 for the all of the Gulf of Maine area, and 0.041 for the areas south and east of Cape Cod). If a stratum did not have an observed take in 2005 or 2006, the assumed bycatch rate was zero.

The average fishing effort (landings) was assumed to be the same as that observed in 2005 and 2006. Within each year, for each port group/management area stratum, the predicted bycatch was estimated as the product of the predicted fishing effort and the range of predicted bycatch rates values under the varying compliance levels, thus resulting in two predicted total bycatch estimates for each year. Then for each of the predicted bycatch rate levels, the average of the predicted 2005 and 2006 bycatch estimates were reported. Therefore, the predicted bycatch range in the Northeast was 151 to 232 harbor porpoises (Table 4-1).

For the Mid-Atlantic during January 1 through April 30, there was no information regarding what the bycatch rate would be for hauls using pingers instead of the gear modifications required by the HPTRP, since these practices have not been observed by the Northeast Fishery Observer Program. After considering a number of possible alternatives, discussed in Palka and Orphanides (2008b) (Appendix I), a bycatch rate was selected that used the average bycatch rate during the pre-HPTRP time period between 1996 and 1998 (when gear modifications were not yet in place), as reduced by the range of the percent bycatch rate reductions afforded by pingers used in the Cape Cod South Management Area, the closest area to the Mid-Atlantic that uses pingers.

The average bycatch estimate in the Mid-Atlantic during the pre-HPTRP time period was 443 (1996: 311, 1997: 572, and 1998: 446). In gillnets that fished in the Cape Cod South Management Area since the implementation of the HPTRP, the percent reduction due to pingers ranged from 22.1% to 69.3%. In other words, using some or all of the required number of pingers reduced the observed bycatch rate to 30.7% to 77.9% of the rate from hauls that did not use pingers. Therefore, the predicted bycatch range in the Mid-Atlantic was 136 to 345 harbor porpoises (Table 4-1): the average bycatch estimate during the pre-HPTRP time period (443) multiplied by the reduction due to pingers in hauls observed in the Cape Cod South Management Area (30.7% to 77.9%).

For the entire HPTRP area, then, the predicted annual harbor porpoise bycatch estimate for Northeast and Mid-Atlantic gillnet fisheries under Alternative 3 ranges from 287 to 577 harbor porpoises, which is below the PBR of 610 (Table 4-1).

Although the efficacy of correctly used pingers in New England was not disputed, past experience shows that poor compliance results in increased harbor porpoise bycatch rates.

Additionally, recently enhanced enforcement efforts show that the disincentive of enforcement quickly increases compliance. Therefore, because dockside enforcement of these measures would be possible, this alternative could ease enforcement efforts and improve compliance, increasing the effectiveness of the HPTRP. However, the option to expand pinger requirements into the Mid-Atlantic, even when the discussion was limited to the Waters off New Jersey, was not favorably received by HPTRT members. The effectiveness of pingers for reducing harbor porpoise bycatch in Mid-Atlantic waters has not been evaluated. However, limited testing has taken place in North Carolina on the effects of acoustic devices on bottlenose dolphins. The dolphins observed during recent studies reacted differently to pingers than harbor porpoises do in that their initial reactions are relatively small and the pingers do not appear to deter them from the vicinity of the nets (Cox et al., 2003). Rather, it is possible that pingers alert bottlenose dolphins to the presence of the nets. In a recent study involving bottlenose dolphin depredation in the Spanish mackerel gillnet fishery, a new type of acoustic deterrent device called the SaveWave was tested to determine its effects on bottlenose dolphins. While a very low amount of depredation was observed during the study, the results indicated that the SaveWave devices did not deter the dolphins from the nets. Rather, the devices appeared to alert dolphins to the presence of the net (the researchers observed increased echolocation in the presence of active SaveWave devices), which could help reduce entanglement risk but could also increase depredation as the devices did not seem to deter the dolphins away from the nets (Read et al., 2006).

With implementation of the non-regulatory measures suggested by the HPTRT and described in Section 2.1 of this EA, such as increased outreach and enforcement efforts, an increase in compliance with the broad-scale pinger requirements would be expected; as such, the bycatch estimate should be closer to the low end of the bycatch estimate range, which is approximately 287 animals per year (Table 4-1). However, if compliance with the new pinger requirements is poor, harbor porpoise bycatch would be closer to the higher estimate (577), which is only 33 animals below PBR.

When compared to Alternative 1 (No Action), Alternative 3 would allow between 486 and 776 fewer harbor porpoises to be taken, which is a reduction of 27% to 54%. Alternative 1 does not amend the regulations and thus, all takes occurring outside of the HPTRP management areas would continue. Alternative 3 would immediately seasonally implement broad-scale pinger requirements in both New England and the Mid-Atlantic, streamlining the requirements, and perhaps easing the burden of enforcing seasonal requirements.

#### 4.1.1.4 Biological Effects of Alternative 4 (Preferred)

Alternative 4 (Preferred) adopts many of the options that received consensus or broad support from the HPTRT. Briefly, Alternative 4 includes a comprehensive suite of measures, fully described in Section 2.2.4. In the GOM and Southern New England area: 1) expanded management areas and seasons are proposed, and 2) "consequence" closure areas are identified that would be closed to gillnet fishing seasonally if bycatch rates within management areas exceed a target compliant bycatch rate for two consecutive years, suggesting compliance with the pinger requirements is low. In Mid-Atlantic waters: 1) a new management area, the Mudhole South Management Area, within the Waters off New Jersey Management Area is proposed in

which both closures and more stringent gear modifications would be required seasonally, and 2) a gear modification change requested by area gillnet fishermen is proposed in the Mid-Atlantic. Because of the complexity of the measures that make up Alternative 4, refer to Palka and Orphanides (2008b) (Appendix I) for a complete description of the methods used to estimate bycatch for each management measure and for the entire range of the HPTRP for Alternative 4.

Similar to the effort data analyzed for Alternatives 1 to 3, the average of the 2005 and 2006 fishing effort, the most recent years for which data are available, is used to represent current fishing effort. Additionally, bycatch is assumed to be zero within management areas and seasons in which regular HPTRP closures are in place.

New England

In New England, the following areas were examined: 1) expand pinger use into November in the Massachusetts Bay Management Area; 2) expand the Massachusetts Bay Management Area's boundary up to 42º 15'N latitude (this action did not significantly affect the predicted bycatch estimate); 3) incorporate the new Stellwagen Bank Management Area; 4) establish the Coastal Gulf of Maine Closure Area (consequence area); 5) create the Southern New England Management Area; and 6) establish the Cape Cod South Expansion and Eastern Cape Cod Closure Areas (consequence areas).

For both the Massachusetts Bay and Stellwagen Bank Management Areas (Gulf of Maine areas) in winter and fall, the bycatch rates were investigated, ranging from the bycatch rate of hauls with 100% compliance as observed during January 1, 1999 to May 31, 2007 (0.031 takes/mtons) to the bycatch rate of hauls observed in the Massachusetts Bay and Mid-Coast Management Areas during January 1, 1999 to May 31, 2007, irrespective of the level of compliance (0.068 takes/mtons).

For the Southern New England Management Area in the winter and fall, the bycatch rates were investigated, ranging from the bycatch rate of hauls from the Cape Cod South Management Area with 100% compliance as observed during January 1, 1999 to May 31, 2007 (0.023 takes/mtons) to the average bycatch rate of all hauls observed in the Cape Cod South Management Area during January 1, 1999 to May 31, 2007, irrespective of the level of compliance (0.041 takes/mtons).

Based on the above information, the predicted annual harbor porpoise bycatch estimate range for Northeast gillnet fisheries if the consequence closure areas are not triggered is 187 to 287 harbor porpoises.

The Coastal Gulf of Maine Closure Area (consequence area) would be triggered if, after the most current two years, the average bycatch rate exceeds the average bycatch rate of 0.031 harbor porpoises/mtons of landings (identified from observed complaint vessels fishing in the Mid-Coast, Massachusetts Bay, and Stellwagen Bank Management Areas). Likewise, the Cape Cod South Expansion and Eastern Cape Cod Closure Areas (consequence areas) would be triggered if, after the most current two years, the average bycatch rate exceeds the average rate of 0.023

harbor porpoises/mtons of landings (identified from observed compliant vessels fishing in the Southern New England Management Area).

If any of the consequence closure areas are implemented, predicted gillnet effort ranged from the minimum effort, which assumes that the amount of fish landed by gillnets within the closure period and area did not occur anywhere else (that is, those gillnet fishermen did not fish elsewhere), to the maximum effort, which assumes that fishing effort was the same as that observed in 2005 and 2006 (gillnet fishermen landed the same amount of fish during the same season, just not within the closed area).

If any of the consequence closure areas are implemented, the predicted bycatch rate was zero since the area was seasonally closed (during October and November for the Coastal Gulf of Maine Closure Area and during February through April for the Cape Cod South Expansion and Eastern Cape Cod Closure Areas). For other port groups and Management Areas that previously fished in the consequence closure areas, the bycatch rate was that determined by the other actions within this alternative. This can be interpreted as these bycatch rates incorporated the effects of the other actions within this alternative and the effects of non-compliance as documented elsewhere in this alternative.

The predicted annual harbor porpoise bycatch estimate ranges for Northeast gillnet fisheries after the consequence closure areas are triggered include: 171 to 287 harbor porpoises when only the Coastal Gulf of Maine Closure Area is closed; 167 to 287 harbor porpoises when the Cape Cod South Expansion and Eastern Cape Cod Closure Areas are closed; and 151 to 287 harbor porpoises when all three Consequence Areas are closed (the Coastal Gulf of Maine, Cape Cod South Expansion, and Eastern Cape Cod Closure Areas) (Table 4-1).

Mid-Atlantic

In the Mid-Atlantic, the following topics were examined: 1) create the Mudhole South Management Area; 2) modify the large mesh gillnet tie-down requirement from no more than 15 feet to no more than 24 feet (this action was assumed not to influence the bycatch rate or amount of fish landed); 3) modify the exempted waters in Virginia from Chincoteague to Ship Shoal Inlet to move them to the 72 COLREGS demarcation lines (this action was assumed not to influence the bycatch rate or amount of fish landed); and 4) extend the eastern boundary of the Waters off New Jersey to the south coast of Long Island at 40° 50.1'N latitude and 72° 30'W longitude (this action was assumed not to influence the bycatch rate or amount of fish landed).

The changes in the bycatch estimate in the Mid-Atlantic for Alternative 4 is expected to result primarily from the addition of the Mudhole South Management Area, particularly the closure from February 1 through March 15.

The maximum amount of fishing effort was established as the average of the 2005 and 2006 landings, demonstrating that prior fishing within this new closure area simply moved to surrounding areas or times within the same season. The minimum amount of fishing effort reduced the Waters off New Jersey landings by the percentage of landings observed in the closed area and period during 2005 and 2006 (15 – 30%).

The predicted bycatch rate ranges from the average bycatch rate of hauls observed between January 1, 1999 and May 31, 2007 that were in 100% compliance with the HPTRT (0.203 takes/mtons), to the average bycatch rate of all hauls observed in the Waters off New Jersey Management Area, irrespective of the level of compliance (0.233 takes/mtons).

The other changes noted above (i.e., modifications to the tie-down requirement, exempted waters, and Waters off New Jersey Management Area boundary) were assumed to not have an influence on the bycatch rate or the amount of fish landed.

Based on the information above, the predicted harbor porpoise bycatch estimate range for the Mid-Atlantic under Alternative 4 is estimated to be between 124 and 183 harbor porpoises (Table 4-1).

New England and Mid-Atlantic Combined

The combined New England and Mid-Atlantic predicted harbor porpoise bycatch estimated range if no consequence closure areas are triggered spans from 311 to 470 harbor porpoises. If only the Coastal Gulf of Maine Closure Area is triggered and goes into effect, the bycatch estimate ranges from 295 to 470 harbor porpoises. If only the Cape Cod South Expansion and Eastern Cape Cod Closure Areas are triggered and go into effect, the bycatch estimate ranges from 291 to 470 harbor porpoises. Finally, if all three consequence closure areas are triggered and go into effect, the harbor porpoise bycatch estimate ranges from 275 to 470 harbor porpoises (Table 4-1).

The above predictions for Alternative 4 (Preferred) largely assume that, despite the trigger of the consequence closure areas, many gillnet fishermen would be able to fish in neighboring areas or during other months within the same season.

Alternative 4 (Preferred) is unique in that four potential scenarios are possible. Prior to the triggering of any consequence closure areas, Alternative 4 would achieve an annual predicted bycatch in the Northeast gillnet fishery between 33% and 50% less than the bycatch under Alternative 1 (No Action), which is a reduction of between 285 and 385 harbor porpoises. In the Mid-Atlantic gillnet fishery, Alternative 4 prior to the trigger of consequence closure areas would achieve a reduction of 25% to 37% when compared to Alternative 1 (No Action), which equates to between 308 and 367 harbor porpoises.

If only the Coastal Gulf of Maine Consequence Closure Area was enacted, Alternative 4 (Preferred) would achieve a predicted annual bycatch in the Northeast gillnet fishery between 285 and 401 fewer harbor porpoises than Alternative 1 (No Action) which is a reduction of 30% to 50%. For the Mid-Atlantic, the bycatch reduction would be the same as the pre-consequence closure area trigger under Alternative 4 (Preferred). If only the Cape Cod South Expansion and Eastern Cape Cod Consequence Closure Areas are enacted, Alternative 4 (Preferred) would achieve a predicted annual bycatch in the Northeast gillnet fishery between 285 and 405 fewer harbor porpoises than Alternative 1 (No Action), which is a reduction of 29% to 50%. Again, the bycatch reduction in the Mid-Atlantic gillnet fishery would be the same as the pre-consequence closure area trigger under Alternative 4 (Preferred).

If all three consequence closure areas are triggered under Alternative 4 (Preferred), the predicted annual bycatch reduction when compared to Alternative 1 (No Action) in the Northeast gillnet fishery would be 285 to 421 harbor porpoises, a reduction of 26% and 50%. The bycatch reduction in the Mid-Atlantic gillnet fishery again would be the same as the pre-consequence closure area trigger.

When compared to Alternative 1 (No Action), all four scenarios under Alternative 4 (Preferred) provide bycatch reduction to levels below PBR. The most reduction would occur if all three consequence closure areas are triggered as long as compliance was fairly high. However, the amount of bycatch reduction amongst the four scenarios does not vary greatly. Prior to the trigger of any consequence closure areas, the predicted bycatch estimates would be between 311 and 470 harbor porpoises; if all three consequence closure areas are triggered, the predicted estimates are between 275 and 470 harbor porpoises (Table 4-1). This is because, if triggered, the consequence closure areas would be closed for only two or three months of the year and are located in specific areas.

Alternative 1 does not amend the regulations and thus, all takes occurring outside of the HPTRP management areas would continue. Alternative 4 would immediately seasonally implement additional conservation measures in both New England and the Mid-Atlantic, including non-regulatory measures described in Section 2.1 such outreach and enforcement efforts to help achieve higher levels of compliance. Should high levels of compliance be achieved, consequence closure areas may not be necessary and harbor porpoise bycatch should remain toward the lower end of the predicted bycatch estimate range.

#### 4.1.1.5 Biological Effects of Alternative 5 (Modified Alternative 4)

Alternative 5 includes the suite of actions proposed in Alternative 4 (Preferred), as well as three additional elements: 1) incorporation of the year-round Western GOM Closure Area (currently required by the Northeast Multispecies FMP) into the regulations implementing the HPTRP under the MMPA; 2) elimination of the HPTRP Offshore Management Area in the Gulf of Maine; and 3) elimination of the Southern Mid-Atlantic Management Area February 15 through March 15 closure period for large mesh gillnet gear. Section 2.2.5 presents a complete description of Alternative 5.

Because Alternative 5 includes all of the elements of Alternative 4, Palka and Orphanides (2008b) (Appendix I) assumed that the predicted bycatch estimates in all port groups and management areas, other than the Offshore Closure Management Area and Southern Mid-Atlantic, are the same as in Alternative 4 (Preferred). Because the Western GOM Closure Area is already implemented under the Northeast Multispecies FMP, no regulatory action is needed for inclusion of this closure in the HPTRP, and its incorporation into the HPTRP is not expected to affect the bycatch estimate.

According to Orphanides and Palka (2008), the removal of the Offshore Management Area and associated pinger requirements (while the Cashes Ledge Closure Area remains in place) results in a predicted bycatch range of 0 to 32 harbor porpoises (Appendix H), which includes 0 to 2 animals in the fall and 0 to 30 animals in the winter. The predicted maximum bycatch rate was

calculated based on the estimated bycatch rate from 1989 to 1998 before pinger requirements under the HPTRP were in place, and the predicted minimum rate was the estimated bycatch rate of hauls that did not use pingers that were observed from 1999 to 2006. This range of predicted bycatch estimates was added onto the Alternative 4 (Preferred) bycatch estimates prior to and after implementation of the consequence closure areas.

The removal of the Southern Mid-Atlantic Management Area February 15 to March 15 large mesh gillnet closure period is predicted to increase the annual bycatch by two to three harbor porpoises (Orphanides and Palka, 2008). Because this area has been closed since the HPTRP was implemented in 1999, the Northeast Fishery Observer Program data from 1994 to 1998 were considered the best dataset to approximate conditions when large mesh gillnet fishing was not restricted. The cumulative increase in the annual bycatch estimate of harbor porpoises resulting from eliminating the Offshore Management Area and the large mesh gillnet closure in the Southern Mid-Atlantic Management Area, combined with Alternative 4 (Preferred) if all three consequence closure areas are triggered, results in an annual predicted bycatch estimate of between 277 and 505 harbor porpoises (Table 4-1). If the three consequence closure areas are not triggered, the predicted bycatch estimate is between 313 and 505 harbor porpoises (Palka and Orphanides, 2008b) (Table 4-1).

The HPTRT made a consensus recommendation to eliminate the Offshore Management Area during the December 19, 2007 meeting. Outside of the Cashes Ledge Closure Area, which would be retained, gillnet fishing effort and harbor porpoise takes in these offshore waters has been very low. Prior to the implementation of the HPTRP, the bycatch rate in the Offshore Management Area was high. Between 1989 and 1998, the fall bycatch rate was 0.0102 takes/mtons, and the winter bycatch rate was 0.1172 takes/mtons (Orphanides and Palka, 2008. See Appendix H). However, since the implementation of the HPTRP, despite the fact that only 44% of all observed effort had pingers, no harbor porpoise takes were observed and gillnet effort has been relatively low.

When the states of Maine, New Hampshire, and Massachusetts proposed a comprehensive suite of alternatives for the GOM in preparation for the January 2008 HPTRT teleconference, they retained the Offshore Management Area and its current pinger requirements. The states' proposal (Appendix F) was broadly supported by the HPTRT during the teleconference. Therefore, while the removal of the Offshore Management Area merits analysis within this EA, it is not proposed within Alternative 4 (Preferred).

Similarly, during the December 2007 and January 2008 HPTRT discussions, a representative of striped bass gillnet fishermen in Virginia requested a state waters exemption to the Southern Mid-Atlantic Management Area's February 15 to March 15 large mesh gillnet closure requirement. They indicated that the closure period impacted the brief window of opportunity afforded to the restricted striped bass ocean fishery. The VMRC submitted a proposal to NMFS and the HPTRT prior to the January 2008 teleconference requesting a change in the definition of large mesh gillnet gear for the Virginia striped bass fishery during the closure period to increase the restricted mesh size to mesh greater than 8 inches (20 cm). This one-inch increase would allow gillnet fishing with large mesh gear while reducing the catch of undersized striped bass. According to the proposal submitted by VMRC, 38 fishermen have ocean striped bass quotas, and only 17 of those fishermen harvested striped bass during the closure period in 2007. This

suggests that effort is low and the state is closely managing the fishery. However, even while under state management, large mesh gillnet fishermen have been operating in Virginia waters during the February 15 to March 15 closure period, despite the HPTRP regulations that have been in effect since 1999.

NMFS' stated objective in the 1998 HPTRP EA (NMFS, 1998) was to establish regulatory measures based on the characteristics of the gillnet fisheries that relate to harbor porpoise bycatch, rather than on target fisheries. Additionally, because the intended target species is not always the actual species landed, regulations based on sub-fisheries become very difficult to enforce. NMFS remains opposed to modifying the regulations implementing the HPTRP to provide special definitions or exemptions for individual sub-fisheries. However, this alternative considers the effect on harbor porpoises of eliminating the entire Southern Mid-Atlantic Management Area closure period. Although elimination of this closure may only increase takes of harbor porpoises by two to three animals each year, the apparent regional disregard for the existing HPTRP requirements and the potential for changes in the large mesh gillnet fisheries' distribution and management in the Southern Mid-Atlantic Management Area, where porpoise takes have been documented, support NMFS' Preferred Alternative, retaining the Southern Mid-Atlantic Management Area closure period.

When compared to Alternative 1 (No Action), Alternative 5 (prior to the trigger of consequence closure areas) would result in a predicted annual bycatch reduction of 253 to 385 animals for the Northeast gillnet fishery, which is equivalent to a 33% to 56% reduction. For the Mid-Atlantic, a predicted annual bycatch reduction of 305 to 365 harbor porpoises is expected, which is equivalent to a 26% to 38% reduction from the bycatch estimates under Alternative 1 (No Action). If all three consequence closure areas are triggered, Alternative 5 would achieve a predicted annual bycatch reduction of 253 to 421 (26% to 56% reduction) in the Northeast gillnet fishery when compared to Alternative 1 (No Action). For the Mid-Atlantic, a predicted annual bycatch reduction of 305 to 365 harbor porpoises is expected, which is equivalent to a 26% to 38% reduction from the bycatch estimates under Alternative 1 (No Action).

If enacted, Alternative 5 would achieve bycatch levels below PBR, unlike Alternative 1 (No Action). Similar to Alternative 4 (Preferred), the predicted bycatch ranges among the two scenarios (pre-trigger and post-trigger of consequence closure areas) do not vary markedly. Implementation of non-regulatory measures as described in Section 2.1, such as increased outreach and education as well as enforcement efforts, should increase compliance which could prevent the future establishment of the consequence closure areas.

### 4.1.2 Comparison of the Biological Effects of the Alternatives

It is difficult to make direct comparisons of the biological effects on harbor porpoises among the five alternatives considered in this EA, as two of the alternatives have multiple scenarios within them (Alternatives 4 and 5) and ranges are used for the predicted bycatch estimates based on observed compliance and fishing effort levels. Alternatives 2 through 5 would all achieve bycatch levels that are below PBR; Alternative 1 (No Action) would not. Alternative 2 would immediately implement seasonal closures which would limit the amount of possible reduction in harbor porpoise bycatch due to the limited seasons and specific locations of these areas. Alternative 3 would implement widespread pinger usage in both New England and the Mid-

Atlantic. If compliance is high, harbor porpoise bycatch reduction would be substantially reduced. However, if compliance is similar to compliance levels in 2005 and 2006, the predicted bycatch estimates would be close to PBR at approximately 577 animals (Table 4-1).

Alternatives 4 (Preferred) and 5 both include scenarios within them based on the possible trigger of consequence closure areas. All scenarios in these two alternatives would achieve similar predicted annual harbor porpoise bycatch estimate ranges. The least protective are those scenarios prior to the trigger of consequence closure areas. The most protective are the scenarios in which all three consequence closure areas are implemented. However, the difference in the minimum predicted annual harbor porpoise bycatch between Alternative 4 (Preferred) prior to consequence closure areas and after all three consequence closure areas have been triggered is 36 animals. The maximum predicted annual harbor porpoise bycatch is the same throughout all four scenarios at 470 animals (Table 4-1).

Alternative 5 has a wider range between the minimum and maximum predicted bycatch estimates than any of the Alternative 4 scenarios, with similar minimum estimates but higher maximum estimates (505 harbor porpoises as opposed to 470 in the Alternative 4 scenarios) (Table 4-1).

When combined with the non-regulatory components discussed in Section 2.1, any alternative implemented to amend the HPTRP requirements would potentially achieve a harbor porpoise bycatch estimate that is closer to the lower end of the range, based on increased compliance with the HPTRP measures due to increased outreach and education and enforcement efforts. If Alternative 4 (Preferred) were implemented and compliance was high, prior to the triggering of any consequence closure areas, harbor porpoise take levels could be as low as one-half the current PBR level (610 animals) and even lower should consequence closure areas be implemented at some point in the future.

### 4.1.3 Biological Effects of Alternative 1 on the Affected Environment

A complete description of the affected environment can be found in Section 3. Gillnets are believed to have little effect on habitat, and the HPTRP affects only gillnet fisheries. None of the alternatives proposed are likely to modify the way that gillnet gear is used in a manner that would affect EFH, HAPC, right whale critical habitat, or the habitat of other protected species.

The HPTRP did not significantly reduce gillnet effort; closures likely shifted effort to nearby waters. Pingers designed to deter harbor porpoises were not expected to affect other protected species, although possible habituation by seals was identified as a concern when pingers were first implemented. Although a slight "dinner-bell effect" may occur for seals in the waters south of Cape Cod, the lack of temporal trends in the bycatch rates of seals since the HPTRP was implemented suggest habituation has not occurred (Palka et al., 2008b. See Appendix D). Additionally, since implementation of the HPTRP, there have been no apparent changes in the rate of interaction of Northeast and Mid-Atlantic gillnet fisheries and other marine mammals, sea turtles, or other protected marine species, as described in Section 3.2. Limited studies on the effects of pingers on bottlenose dolphins have occurred and it seems that pingers do not have the same deterring effects on bottlenose dolphins as they do on harbor porpoises (Cox et al., 2003;

Read et al., 2006). The Alternatives proposed are not likely to modify gillnet fisheries in a way that would affect protected species, although there may be some slight benefit to species that overlap with the distribution of harbor porpoises. Elimination of the February 15 to March 15 large mesh gillnet closure in the Southern Mid-Atlantic Management Area under Alternative 5 might result in a slight increased risk of entanglement of sea turtles and bottlenose dolphins. However, these species are rarely found in this area during February and March, when coastal Mid-Atlantic waters remain cool.

## 4.2 Economic Impacts of the Alternatives

The proposed action implements a suite of measures designed to reduce the incidental take of harbor porpoises by the domestic commercial gillnet fishery conducted off the Northeast U.S. The five alternatives use combinations of gear modifications and closures to reduce the incidental take or bycatch of harbor porpoises to below PBR; none of the alternatives is anticipated to reduce the bycatch to the long-term goal of ZMRG. While each alternative is composed of individual components that may be spatially and temporally separate, the interrelationships between the components require that they be analyzed as a unit.
The five alternatives analyzed are described in detail in Section 2. Alternative 1 (Alt. 1) provides no action beyond the existing HPTRP regulations. Under Alternative 2 (Alt. 2), four closures are immediately implemented, in addition to the existing HPTRP requirements.[5] Alternative 3 (Alt. 3) expands pinger requirements throughout the times and areas of harbor porpoise distribution, and removes gear modifications from the Mid-Atlantic. Alternative 4 (Preferred) is modeled as four components. Initially, during a pre-trigger phase (Alt. 4-Pre), pinger requirements are expanded by time and area in the New England region and the Mudhole South Management Area (MSMA) is closed from February 1 to March 15 and incorporates the same gear requirements as the existing Mudhole closure.

At any point after two consecutive years, if the observed two-year average bycatch rates exceed the specified target bycatch rates, three different closure scenarios may unfold. For the first scenario, if the average bycatch rate of the Mid-Coast, Massachusetts Bay, and Stellwagen Bank Management Areas in the Gulf of Maine (GOM) exceed the specified target rate (0.031 takes/mtons), then the Coastal GOM Consequence Closure Area (CGOMCCA) would close during October and November (Alt. 4-GOM). For the second scenario, if the average bycatch rate exceeds the specified target rate (0.023 takes/mtons) in the Southern New England Management Area (SNE), the Cape Cod South Expansion Consequence Closure Area (CCSECCA) and the Eastern Cape Cod Consequence Closure Area (ECCCCA) would close during February through April (Alt. 4-SNE). For the third scenario, it is possible for all three areas (CGOMCCA, CCSECCA and ECCCCA) to be closed simultaneously if both specified target bycatch rates are exceeded (Alt. 4-Both).

Alternative 5 (Alt. 5) slightly modifies Alt. 4 by removing the Offshore Management Area (OMA) and associated pinger requirements, removing a seasonal closure in the Southern Mid-Atlantic Management Area (SMA), and incorporating the Multispecies Western GOM Closure Area into the HPTRP. Alt. 5 includes a pre-trigger period (Alt. 5-Pre) which models the removal

[5] Because the closures in Alternative 2 cover the same times and areas as the closures in Alternative 4, they are called by the same name even though the Alt. 2 closures are not "consequence" closure areas.

of the OMA and SMA closure as well as the provisions under Atl. 4-Pre; there are no economic impacts from the inclusion of the Western GOM Closure Area in the HPTRP. In addition, implementation of the closure of all three consequence areas is modeled (Alt. 5-Both). This section describes the methods, data, assumptions and results for the analysis of the economic impacts of the alternatives. Where possible a quantitative analysis is provided; however, some the discussion remains qualitative due to data and model limitations.

### 4.2.1 Data and Methods

#### 4.2.1.1 Data

All data used in the analyses were from calendar year 2006, the last year of data used in the bycatch analysis. Changes in fishing effort patterns were modeled using a Closed Area Model (CAM; described in detail below) in which data from the following databases were used. To model effort in terms of days absent from port (measured by the difference between the time of departure and the time of landing), fishing location and landings data were extracted from the following NERO/NEFSC databases: the Northeast Commercial Fisheries database (CF); the Northeast Vessel Monitoring System database (VMS); and, the Northeast Vessel Tracking and Reporting database (VTR). The NERO Vessel Permit database was used to determine if a vessel held a multispecies permit, and to determine the length of vessels. The NEFSC observer database (OBS) was used to calculate the average operating cost per day absent by vessel length. The NERO Days-at-Sea (DAS) database was used to determine allocated and leased DAS under the Northeast Multispecies FMP, as well as to determine whether a vessel was considered either a day boat or trip gillnet vessel. The NEFSC CF database was used to calculate average monthly ex-vessel prices by species in the Northeast region (i.e., from Maine to North Carolina).

Information on the cost of pingers and their installation was provided by NERO staff, based on contact with pinger manufacturers and fishermen (J. Higgins, pers comm). The cost was per pinger unit, and included the cost of the pinger, batteries and installation.[6] To estimate the pinger investment cost per vessel (Table 4-2), the maximum number of nets was multiplied by the total cost per pinger.[7] Under the Northeast Multispecies FMP (50 CFR 648.80), vessels designated as "day boats" are allowed to leave their nets in the water between trips while "trip boats" must remove all gear between trips. Consequently, for day boats the observer data on the number of nets hauled on a trip may not reflect the number of nets operated. For day boats, the maximum number of nets is prescribed by the regulation, which varies with fishing location (Table 4-2). A vessel's activity codes in the DAS database were used to determine if it was a day or trip boat, while vessels not in the DAS database were categorized as day boats. For trip boats the same number of nets used in the analyses for the ALWTRP (NMFS, 2007) was used in the economic impact analyses. For vessels fishing in the Mid-Atlantic region, the maximum number of nets per vessel is determined by the HPTRP. Up to 80 large mesh nets or up to 45

[6] Installation cost was based on the opportunity cost of the fishermen, estimated as the median wage for fishers (occupation code 45-3011) by the U.S. Department of Labor, Bureau of Labor Statistics (www.bls.gov).

[7] The current HPTRP requires a pinger at the end of each string of gillnets and on the bridles between nets for a total number of pingers per string equal to the number of nets plus one. Information was not available on the number of nets per string so only the total (maximum) number of nets was used in the calculation, suggesting the cost may be an underestimate.

small mesh nets may be used; for the economic impact analyses, the larger value was used. Under Alt. 3, the gear modifications for the management areas in the Mid-Atlantic (Waters off New Jersey, Mudhole, and Southern Mid-Atlantic Management Areas) would be removed, including the maximum number of nets. This change is not included in the model as it was not clear what an appropriate upper limit for the number of nets in the future would be.

**Table 4-2: Maximum number of nets fished and total pinger cost by vessel type and fishing location.**

| Type of vessel | Fishing Location | Max Nets | Total Pinger Cost for Materials & Labor |
|---|---|---|---|
| Day Boat | GOM [a] | 100 | $ 7,937 |
| Day Boat | SNE | 75 | $ 5,953 |
| Trip Boat | NE | 176 | $13,969 |
| Day or Trip Boat | MA | 80 | $ 6,350 |

[a] The maximum combined for groundfish and flatfish nets.

To expand the CAM model results to the potentially affected gillnet fleet two federal and two state data sources were used. The NEFSC CF and VTR databases were the principal data sources, with the CF data considered a near census of landings and revenues for state and federally permitted vessels. The VTR database was used to augment the CF data on the number of gillnet vessels using a port. The NERO permit database was used to determine the vessel length for all federally permitted vessels. The Virginia Marine Resources Commission (VMRC) provided trip level data to determine the number of vessels, landings and revenues attributable to VA gillnet vessels fishing on the ocean side of the COLREGS lines. The North Carolina Department of Marine Fisheries (NCDMF) provided trip level data to determine the quantity of vessels, landings and revenues attributable to NC gillnet vessels fishing on the ocean side of the COLREGS lines, as well as to determine the length of such vessels.[8]

#### 4.2.1.2 Framework for Analysis

The overall framework for economic analysis is the change in benefits and costs, and ultimately net national benefits (NNB). This analysis focused on direct costs to gillnet fishermen under each of the alternatives with the cost evaluated using a CAM, discussed in detail below. However, for NNB, costs are only part of the analysis, as these must be compared to all future national benefits of the proposed actions.

There is no commercial value associated with harbor porpoises; however, a reduction in harbor porpoise bycatch would result in non-market benefits to the nation if the public valued harbor porpoises. Public values for a non-market species can be measured as willingness-to-pay (WTP) using contingent valuation surveys. There are no recent WTP values for harbor porpoises, although a past study indicated that some of the U.S. public had positive values for harbor porpoise protection (McConnell and Strand, 1997). This suggests that national benefits would accrue from protection, although the benefits cannot presently be accurately monetized for a calculation of net national benefits (i.e., benefits minus costs).

[8] The COLREGS lines were selected because under the HPTRP, they mark the boundary between regulated (ocean side) and exempted (landward side) waters.

However, a cost-effectiveness analysis was feasible (i.e., cost per harbor porpoise saved). It was assumed that the unknown WTP value of one harbor porpoise saved is equal across the range of protection levels provided by alternatives; this is appropriate given the narrow range of outcomes. The cost-effectiveness estimate used a 10-year time horizon with a comparison of results using a 3% and a 7% discount rate, as specified by the Office of Management and Budget (2003), based on 2006 values.

#### 4.2.1.3 Closed Area Model (CAM)

To estimate direct costs to the gillnet fishery under the alternatives, the CAM, developed for analysis of Northeast Multispecies FMP actions (NEFMC, 2006), was modified to analyze the five HPTRP alternatives. The CAM distributes individual vessel's fishing effort over time and space, optimizing its distribution to maximize individual vessel profits.

The principal modification to the CAM was the incorporation of gillnet vessels lacking multispecies permits. This improved the modeling of gillnet fishing effort for vessels from New York, New Jersey, and the Mid-Atlantic. The population of potentially affected vessels for the HPTRP includes all commercial gillnet vessels which fished in federal waters between North Carolina and the U.S./Canada boundary in the Gulf of Maine, as well as vessels which fished in state waters in areas where harbor porpoise habitat exists. Gillnet fishing effort in internal (i.e., exempted) waters of North Carolina and Virginia were excluded; however, gillnet effort in all other state waters were included in the analysis.

Coverage of gillnet fishing vessels by the CAM varied by port group and vessel size (Table 4-3). In general, the model had a better representation of vessels in the larger vessel category (≥ 40 ft) and of vessels in New England port groups. The CAM utilizes spatially referenced VTR data, but vessels without federal permits are not required to submit VTR trip reports.[9] Of the 975 gillnet vessels fishing in inshore and offshore waters, 361 (37%) were included in the CAM. The remaining vessels included in the CF and state trip databases were excluded because either their fishing activity records lacked spatially referenced information or this information was not referenced to a resolution that allowed inclusion in the model. Based on information within the CF database, vessels that did not submit trip reports had lower average landings and revenues than vessels submitting reports. Thus, the extrapolation of the modeling results to all vessels within the gillnet fleet may overestimate the impacts.

[9] Federally permitted vessels must submit reports for all fishing activity, including activity in state waters. In addition, New York state permitted vessels submit VTR data, which are included in the analysis.

**Table 4-3: Total number of potentially affected gillnets vessels by port group and size class, and percentage included in CAM model. Note that vessels without length information were grouped with vessels less than 40 feet.**

| | Number of vessels | | | Percent in CAM | | |
|---|---|---|---|---|---|---|
| | < 40' | ≥ 40' | Total | < 40' | ≥ 40' | Total |
| Maine | 21 | 34 | 55 | 43% | 59% | 53% |
| New Hampshire | 14 | 20 | 34 | 57% | 85% | 74% |
| North of Boston | 54 | 68 | 122 | 33% | 40% | 37% |
| South of Boston | 15 | 13 | 28 | 33% | 31% | 32% |
| East of Cape Cod | 27 | 32 | 59 | 11% | 53% | 34% |
| South of Cape Cod | 44 | 56 | 100 | 57% | 70% | 64% |
| New York [a] | 55 | 23 | 78 | 100% | 57% | 87% |
| New Jersey | 32 | 56 | 88 | 66% | 66% | 66% |
| Delaware/Maryland | 11 | 8 | 19 | 27% | 38% | 32% |
| Virginia [b, c] | 22 | 38 | 60 | 23% | 32% | 28% |
| North Carolina [b, d] | 290 | 42 | 332 | 2% | 29% | 6% |
| Total | 585 | 390 | 975 | 27% | 52% | 37% |

Source: NMFS CF data unless noted
[a] Commercial data adjusted to include state vessels recorded in VTR system.
[b] Only vessels that fish outside of internal waters.
[c] Source: Virginia Marine Resources Commission
[d] Source: North Carolina Department of Marine Fisheries

The CAM is a non-linear programming model run using the General Algebraic Modeling System (GAMS). The CAM accounts for potential changes in fishing effort in response to changes in regulations. In its present configuration, the CAM maximizes profits for each individual vessel in the model, by allocating its fishing effort to the block/months with the highest profits; blocks are 30 minutes square. Profits are revenues per day absent minus operating costs per day absent. Vessels are constrained by their number of allocated plus leased multispecies DAS, and their observed days absent for other trips (i.e., trips where no multispecies were kept). Data from all vessels in the model were used to calculate average species-specific catch per unit effort (CPUE) values per day absent, by block/month, trip types (multispecies or other), and vessel length. The CPUEs by block/months were then used to model trip limit constraints and closures based on mesh size. The model generates an estimate of each vessel's "best" allocation of fishing effort by block/month for a fishing year given a particular set of regulatory measures.[10]

Within the model, the possible fishing locations for a vessel were determined by that vessel's fishing history and the history of similar vessels landing in that same port. As a surrogate for vessel characteristics, the gillnet fleet was divided into two groups based on vessel length; Class 1 vessels measuring less than 40 feet and Class 2 vessels measuring 40 feet or greater. Within the CAM, this length class grouping prohibited Class 1 vessels from choosing to fish alternative sites based on the fishing patterns of the larger-sized Class 2 vessels. It was assumed that a small vessel could not safely fish as far offshore as a larger vessel.

[10] A vessel's allocated effort (DAS) may exceed its observed effort. Consequently, the model estimate of landings under the status quo scenario (i.e., "best") may be greater than the observed values.

The recent major changes implemented under the Multispecies and Monkfish FMPs were incorporated to model the 'no action' or status quo alternative (Alt. 1). Framework 42 to the Multispecies FMP was enacted in November 2006 and the associated trip limits and differential DAS in the Framework were included in the status quo model. Additionally, the monkfish trip limits for the northern management area under Framework 4 (implemented in October 2007) were included. However, the monkfish DAS changes enacted under this Framework were not incorporated due to data limitations.

The five HPTRP alternatives were modeled using three management measures singularly or in combination. These measures were: 1) area closures, 2) gear modifications, and 3) gear specific closures. To model time and area closures, such as those in Alt. 2, fishing effort was set to zero in the relevant blocks/months. In the model, blocks could only be closed for complete months, so areas closed for part of a month (e.g., February 15-March 15) were closed for the entire month. In the event of a closure, a vessel that had previously fished in the proposed closed area had two choices. First, the vessel could choose not to fish at all. Alternatively, a vessel could fish elsewhere based on either its previous history or the fishing history of vessels in the same length class landing in the same port. The CAM determined the most profitable fishing choice for such a vessel.

The CAM was also used to model the impact of gear modifications, such as expanded pinger requirements for the gillnet fleet (i.e., Alt. 3, Alt. 4, Alt.5). However, other gear modifications could not be modeled including the removal of all gear modifications for Mid-Atlantic vessels under Alt. 3 and a change in the tie-down requirements for Alt. 4 and Alt. 5. To model the change in pinger requirements, the gillnet fleet was divided into four vessel categories based on pinger ownership and fishing locations. First, vessels were categorized into those that owned pingers and those that did not. A vessel that in 2006 had fished in areas that required pingers under the current management plan (i.e., Alt. 1) were assumed to already possess pingers; these vessels did not incur additional gear costs due to the expanded pinger requirements. Vessels that had not fished in current pinger areas were assumed not to own pingers. Vessels that did not own pingers and had not previously fished in the new pinger areas were assumed not to need pingers and therefore did not incur any additional costs due to the new pinger requirements.

Vessels that did not own pingers but which had previously fished in the areas with new pinger requirements could either (a) purchase pingers and fish in the areas with new pinger requirements, or (b) not purchase pingers and limit their fishing activities to areas without pinger requirements. The first choice resulted in a cost equal to the vessel specific pinger costs (Table 4-2), while the second could result in reduction of profits due to the more restricted fishing area. For these vessels, the CAM was used to make the determination of whether or not to purchase pingers. The decision to purchase pingers was based on the profit differential between fishing in the areas with new pinger requirements and not fishing in these areas. If the differential minus the cost for pingers was positive, the vessel would purchase pingers. The cost of purchasing pingers was assumed to occur in year one, the most extreme case. For vessels where the profit differential minus the cost of pingers was less than or equal to zero, pingers were not purchased. The cost of the action for these vessels was a loss in profits, in each year.

To model gear specific closures or the removal of such closures, block/month CPUE values for specific species were modified. Based on work conducted for the BDTRP, mesh size was mapped to species targeted. Of the 21 species modeled in the CAM, it was assumed that for the Waters off New Jersey (WONJ) and in the SMA Management Areas, both monkfish and striped bass were caught in large mesh gillnets (7"-18") while fluke and dogfish were caught in small mesh gillnets (5"-6.9"). When an area was closed, the CPUE for the specific species was set to zero for the appropriate blocks/months. For proposed closures that did not span a full month, the CAM results may overestimate the impacts. Alternative 5 included the removal of the SMA closure (during February 15 – March 15) to large mesh gillnets. Under Alt. 1, Alt. 2, Alt. 3 and Alt. 4, large mesh gillnet prohibitions in the Mid-Atlantic were modeled by zeroing the CPUE for the appropriate species, while under Alt. 5 the CPUE for large mesh species was allowed to be positive. Calculation of the CPUE values for February and March for the species of interest was dominated by landings from the open periods (i.e., first two weeks of February and last two weeks of March). The model assumed these values were representative of potential landings during the entire month.

To evaluate the four alternatives (Alt. 2-Alt. 5) relative to the status quo (Alt. 1), nine versions of the CAM were run with the different combinations of management measures. For example, Alt. 4-Pre implements a gear modification (expanded pinger areas) and a gear specific closure (Mudhole South Management Area). Therefore, both types of management measures were implemented within one alternative.

#### 4.2.1.4 Expansion of CAM Results to the Fleet

The initial CAM run was defined as Alt. 1 (No Action, status quo), with additional scenarios for each alternative, including multiple scenarios for Alt. 4 and Alt. 5. For each alternative, the CAM generates vessel-level results for revenues, profits and landings by area fished (block) and month. Each vessel is assigned a single size class and principal port group of landing.[11] Industry impacts were estimated by expansion – using 2006 data – of the CAM results at the level of vessel size category by port group to the potentially affected gillnet fleet.

The CAM output provides an estimate of each vessel's "best" allocation of fishing effort given a set of restrictive measures. Consequently, assumptions regarding effort allocation, CPUE, prices, and effort restrictions can affect the economic impact results. For example, only one year of data (2006) was used, with the implicit assumption that 2006 was a representative year. However, information on the inter-annual variability of fishing effort and the CPUE is not included in the model, and hence the applicability of the model output depends on how 2006 compares to future years. In addition, only a select number of regulatory actions that have occurred since 2006 were incorporated into the Alt. 1 (status quo), and none of the actions under other Take Reduction Plans (right whales, bottlenose dolphins) were incorporated within the CAM. Hence, the impacts of the proposed alternative may be overestimated if, for example, reductions in fishing effort have not been taken appropriately (or completely) into account. However, the same assumptions were used throughout the entire analysis, which allows relative comparisons across alternatives.

[11] The principal port of landing by port group was assigned as the port group in which a vessel had its greatest share of revenues in the status quo scenario. This assignment was maintained for all scenarios.

To estimate the cost-effectiveness of each of the alternatives, a consistently derived estimate of the reduction in harbor porpoise bycatch was required. The HPTRP bycatch analyses provided a minimum and maximum range of outcomes (Section 4.1.1, Biological Effects of the Alternatives on Harbor Porpoises). In the economic analyses, an estimate of bycatch was calculated for each scenario by applying the landings from the CAM to the time-area specific bycatch rate used to estimate the upper bound (maximum) harbor porpoise bycatch. The percent reduction between Alt. 1 and each scenario by region (New England, Mid-Atlantic) and season (winter, summer, fall) was calculated, and applied to the 2005-2006 harbor porpoise bycatch estimates to generate the "economic bycatch" estimate. This upper-bound estimate of bycatch provides a lower-bound estimate of the reduction in harbor porpoise bycatch for use in the cost-effectiveness analysis.

The "economic bycatch" estimates take into account effort adjustments based on economic principles as well as the bycatch rates used to calculate the maximum bycatch value for each alternative. Consequently, the "economic bycatch" estimate is sensitive to the assumptions used in both the CAM and the model used to estimate bycatch rates (Section 4.1.1, Biological Effects of the Alternatives on Harbor Porpoises). Incorporation of the variances associated with the effort estimates and/or the bycatch rates would allow for a better evaluation of the probable success of the proposed actions (i.e., if the confidence interval on the harbor porpoise bycatch estimate extends beyond PBR), as well as provide a distribution around the cost estimates for the proposed actions.

### 4.2.2 Results

CAM results are annual impacts at the vessel level, which are expanded to the regional (i.e., port group) and industry levels using data from 2006. A cost-effective measure for a ten-year period was calculated to provide a national perspective. This allows alternatives to be compared from different perspectives (e.g., industry to national). The ranking of alternatives varies with the perspective used, but alternatives with extensive closures have much larger impacts at all levels then alternatives that rely on gear modifications.

The rank order of alternatives based on impacts would depend on the perspective from which the ranking is undertaken. At the vessel level, the impacts on revenues and profits differ by port and often by vessel size class within a port. At the regional level the ranking would depend on the port group in question, although for Maine, South of Boston, New Jersey and North Carolina the impacts on revenues are small (± 2%) for all the alternatives. From the industry perspective, Alt. 3, Alt. 4-Pre and Alt. 5-Pre have the lowest annual impacts on revenues, while Alt. 2, Alt. 4-Both and Alt. 5-Both have the highest annual impacts. From a national perspective over ten years, Alt. 2 is clearly the least cost-effective. The most cost-effective alternatives are Alt. 3, and versions of Alt. 4 and Alt. 5 where closures are never triggered or where the closures are triggered very late (e.g., year nine or ten).

#### 4.2.2.1 Vessel Impacts

The economic impacts of the alternatives on vessels were assessed by changes in revenues and profits of the affected vessels relative to the status quo (Alt. 1). Changes in revenues (Table 4-4) and profits (Table 4-5) follow similar patterns, although in general profit reductions are slightly

larger than revenue reductions. While each alternative is composed of a group of actions, several of the actions have similar impacts at the vessel level across multiple alternatives. To highlight the similarities, commonalities in impacts of the closures are first addressed, then impacts of the expansion of pinger requirements, and finally the impacts of the combined measures under Alt. 4 (Preferred).

**Table 4-4: Average revenues per vessel for status quo (2006) and percent change in revenues by alternative for affected vessels compared to Alternative 1 by port and vessel size. Size class is 1 for vessels less than 40 feet and 2 for vessels 40 feet and longer.**

| Port group | Size Class | Status Quo Revenue ($/vessel) | Percent change in revenues by alternative* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 1 | 71,630 | -14 | | | -14 | | -14 | | -14 |
| | 2 | 117,531 | -2 | | | -2 | | -2 | | -2 |
| New Hampshire | 1 | 95,029 | -28 | | | -28 | | -28 | | -28 |
| | 2 | 175,320 | -4 | | | -4 | | -4 | | -4 |
| North of Boston | 1 | 80,611 | -17 | | | -16 | -5 | -17 | | -17 |
| | 2 | 152,020 | -4 | | | -1 | -5 | -4 | | -4 |
| South of Boston | 1 | 62,412 | | | | | | | | |
| | 2 | 130,112 | -1 | | | | -1 | -1 | | -1 |
| East of Cape Cod | 1 | 91,133 | -12 | -1 | -1 | <-1 | -4 | -4 | -1 | -4 |
| | 2 | 287,428 | -5 | -1 | -1 | <+1 | -5 | -5 | -1 | -5 |
| South of Cape Cod | 1 | 87,315 | -7 | -52 | -5 | -7 | -7 | -7 | -5 | -7 |
| | 2 | 101,733 | -14 | -7 | -7 | <-1 | -14 | -14 | -7 | -14 |
| New York | 1 | 77,537 | | -5 | -6 | -10 | -10 | -10 | -6 | -10 |
| | 2 | 45,252 | -25 | -5 | -6 | | -25 | -25 | -6 | -25 |
| New Jersey | 1 | 109,488 | -2 | -2 | -1 | -2 | -1 | -2 | -1 | -2 |
| | 2 | 176,843 | -2 | -3 | -2 | -2 | -2 | -2 | -2 | -2 |
| Delaware/Maryland | 1 | 69,056 | | -2 | | | | | 5 | 5 |
| | 2 | 49,231 | | -1 | | | | | 10 | 10 |
| Virginia | 1 | 18,000 | | -5 | | | | | <+1 | <+1 |
| | 2 | 67,748 | | -1 | | | | | 2 | 2 |
| North Carolina | 1 | 6,844 | | -3 | | | | | <+1 | <+1 |
| | 2 | 40,551 | | -2 | | | | | <+1 | <+1 |

* The definitions of the alternatives are as follows: "Alt. 2" is Alternative 2 (closures); "Alt. 3" is Alternative 3 (widespread pinger requirements); "Alt. 4-Pre" is Alternative 4 (Preferred) prior to the implementation of consequence closure areas: "Alt. 4-GOM" is Alternative 4 (Preferred) after the Coastal Gulf of Maine Consequence Closure Area is triggered into effect; "Alt. 4-SNE" is Alternative 4 (Preferred) after the Cape Cod South Expansion and Eastern Cape Cod Consequence Closure Areas) are triggered into effect; "Alt. 4-Both" is Alternative 4 (Preferred) after the consequence closure areas in both regions (Gulf of Maine and southern New England) are triggered into effect (i.e., the Coastal Gulf of Maine, Cape Cod South Expansion, and Eastern Cape Cod Consequence Closure Areas are all triggered into effect); "Alt. 5-Pre" is Alternative 5 prior to the implementation of consequence closure areas; and "Alt. 5-Both" is Alternative 5 after the consequence closure areas in both regions (Gulf of Maine and southern New England) are triggered into effect (i.e., the Coastal Gulf of Maine, Cape Cod South Expansion, and Eastern Cape Cod Consequence Closure Areas are all triggered into effect).

**Table 4-5: Percent change in profits for affected vessels by port, vessel length and alternative. Size class is 1 for vessels less than 40 feet and 2 for vessels 40 feet and longer.**

| | | Percent change in profits by alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Port Group | Size Class | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 1 | -14 | | | -14 | | -14 | | -14 |
| | 2 | -2 | | | -2 | | -2 | | -2 |
| New Hampshire | 1 | -30 | | | -30 | | -30 | | -30 |
| | 2 | -6 | | | -6 | | -6 | | -6 |
| North of Boston | 1 | -18 | | | -17 | -5 | -18 | | -18 |
| | 2 | -4 | | <-1 | -1 | -6 | -4 | <-1 | -4 |
| South of Boston | 1 | | | | | | | | |
| | 2 | -1 | | | | -1 | -1 | | -1 |
| East of Cape Cod | 1 | -12 | -1 | -1 | <-1 | -4 | -4 | -1 | -4 |
| | 2 | -6 | -1 | -1 | | -6 | -6 | -1 | -6 |
| South of Cape Cod | 1 | -8 | -56 | -6 | -8 | -8 | -8 | -6 | -8 |
| | 2 | -16 | -9 | -9 | <-1 | -16 | -16 | -9 | -16 |
| New York | 1 | | -7 | -7 | -12 | -12 | -12 | -7 | -12 |
| | 2 | -29 | -6 | -7 | | -29 | -29 | -7 | -29 |
| New Jersey | 1 | -2 | -3 | -1 | -2 | -1 | -2 | -1 | -2 |
| | 2 | -2 | -4 | -2 | -2 | -2 | -2 | -2 | -2 |
| Delaware/Maryland | 1 | | -3 | | | | | 6 | 6 |
| | 2 | | -1 | | | | | 12 | 12 |
| Virginia | 1 | | -7 | | | | | <+1 | <+1 |
| | 2 | | -2 | | | | | 2 | 2 |
| North Carolina | 1 | | -3 | | | | | <+1 | <+1 |
| | 2 | | -2 | | | | | 1 | 1 |

Alternatives that close the CGOMCCA (Alt. 2, Alt. 4-GOM, Alt. 4-Both, Alt. 5-Both) would have negative impacts on vessels from Maine to New Jersey (Tables 4-4 & 4-5). However, the largest impacts could be on vessels from GOM ports (Maine to South of Boston), which land 80-97% of their catch from GOM waters (Table 4-6). Substantial differences in profit reductions occur among vessel size classes. Profits of small vessels (size class=1) in GOM ports are reduced between 14-30%, while large vessels (size class=2) have 2-6% profit reductions (Table 4-5). However, a higher proportion of large vessels are affected (Table 4-7). The closing of the CGOMCCA did not affect South of Boston vessels because in Alt. 1 (No Action, status quo) the existing Multispecies FMP Rolling Closure Area V overlaps spatially and temporally with the CGOMCCA.

**Table 4-6: The percent of a port's landings caught in the Gulf of Maine (GOM), Georges Bank (GB), southern New England Management Area (SNE), south of southern New England (SSNE), Waters Off New Jersey (WONJ), and the Mid-Atlantic (MA) under Alternative 1 (No Action).**

| | GOM | GB | SNE | SSNE | WONJ | MA |
|---|---|---|---|---|---|---|
| Maine | 96 | 4 | | | | |
| New Hampshire | 97 | 3 | | | | |
| North of Boston | 81 | 13 | 5 | | | 1 |
| South of Boston | 80 | 1 | 19 | | | |
| East of Cape Cod | <1 | 22 | 77[a] | 1 | | |
| South of Cape Cod | 2 | 12 | 79[b] | 7 | | |
| New York | | | 62 | <1 | 38 | |
| New Jersey | | 7 | <1 | <1 | 90 | 3 |
| Delaware/Maryland | | | | | | 100 |
| Virginia | 1 | | | | | 99 |
| North Carolina | | | | | 1 | 99 |

[a] For vessels from the East of Cape Cod, 5% of their landings are from ECCCCA, 9% are from the CCSECCA and 63% are from outside and east of the Cape Cod South Management Area (CCSMA).
[b] For vessels from the South of Cape Cod, 2% of their landings are from ECCCCA, 64% are from inside the CCSMA, 4% are from outside and west of the CCSMA and 9% are from outside and east of the CCSMA.

**Table 4-7: Percent of vessel affected by port, vessel length and alternative. Size class is 1 for vessels less than 40 feet and 2 for vessels 40 feet and longer.**

| | | Percent of vessels affected by alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Port Group | Size Class | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 1 | 11 | | | 11 | | 11 | | 11 |
| | 2 | 30 | | | 30 | | 30 | | 30 |
| New Hampshire | 1 | 50 | | | 50 | | 50 | | 50 |
| | 2 | 71 | | | 71 | | 71 | | 71 |
| North of Boston | 1 | 61 | | | 61 | 6 | 61 | | 61 |
| | 2 | 70 | | | 56 | 41 | 70 | | 70 |
| South of Boston | 1 | | | | | | | | |
| | 2 | 50 | | | | 50 | 50 | | 50 |
| East of Cape Cod | 1 | 33 | 100 | 100 | 67 | 100 | 100 | 100 | 100 |
| | 2 | 76 | 12 | 12 | 6 | 76 | 76 | 12 | 76 |
| South of Cape Cod | 1 | 64 | 4 | 8 | 8 | 68 | 68 | 8 | 68 |
| | 2 | 72 | 10 | 10 | 3 | 72 | 72 | 10 | 72 |
| New York | 1 | | 36 | 23 | 13 | 13 | 13 | 23 | 13 |
| | 2 | 23 | 54 | 46 | | 23 | 23 | 46 | 23 |
| New Jersey | 1 | 38 | 62 | 38 | 38 | 38 | 38 | 38 | 38 |
| | 2 | 41 | 51 | 41 | 41 | 41 | 41 | 41 | 41 |
| Delaware/Maryland | 1 | | 100 | | | | | 100 | 100 |
| | 2 | | 100 | | | | | 67 | 67 |
| Virginia | 1 | | 60 | | | | | 60 | 60 |
| | 2 | | 58 | | | | | 58 | 58 |
| North Carolina | 1 | | 86 | | | | | 100 | 100 |
| | 2 | | 100 | | | | | 100 | 100 |

Alternatives that close the CCSECCA and the ECCCCA (Alt. 2, Alt. 4-SNE, Alt. 4-Both, Alt. 5-Both) affect ports from North of Boston to New Jersey. The largest reductions in profits from these closures are for vessels landing in the South of Cape Cod ports (Alt. 4-SNE reduction 8-16%; Table 4-5) as these vessels fish predominantly in the SNE area (Table 4-6), with about 64% of their landings harvested from the CCSECCA. Vessels from the East of Cape Cod port group also primarily fish in the SNE area; however, only 9% of the landings from this port group are from the CCSECCA and just 5% are from the ECCCCA. Therefore, the impacts of these closures are less severe for vessels from East of Cape Cod than for vessels from South of Cape Cod port groups.

Alternatives that closed the MSMA (Alt. 2, all Alt. 4, all Alt. 5) primarily affect vessels from New Jersey and New York. This impact is not readily apparent as the MSMA occurs in all alternatives except Alt. 3; however, New Jersey vessels harvest 90% of their fish from New Jersey waters (Table 4-6) and the profit reduction for alternatives with the MSMA closure is 2-3%. The MSMA and CCSECCA impact vessels from New York since the harvest of these vessels is split almost equally between the SNE (62%) and WONJ (38%) areas (Table 4-6). Both closure areas reduce profits of the New York vessels by 6-29%.

Alternatives that expanded pinger requirements spatially and temporally (Alt. 3, all Alt. 4, all Alt. 5) have the greatest impact on vessels from South of Cape Cod ports. Impacts are limited in the Northeast, as 82-98% of vessels in this area already own pingers (based on trip reports showing that in 2006 these vessels fished in areas and times requiring pingers). The expansion of pinger requirements generally had small negative impacts on profits (<10%) of the vessels affected. Exceptions included a small number of vessels with low revenues in South of Cape Cod where the percentage impact appears large (e.g., 56% for Alt. 3). Vessels in the Mid-Atlantic are affected only when the expansion is very broad under Alt. 3, as 99-100% of the harvest of these vessels is from the Mid-Atlantic (Table 4-6).

In general, Alt. 3 had the lowest impacts on the profits of affected vessels (1-9% reduction), while alternatives that closed the CGOMCCA (Alt. 2, Alt. 4-GOM, Alt. 4-Both, Alt. 5-Both) had the largest impacts (2-30% reduction). Alt. 5 differed from Alt. 4 by removing two management restrictions, which resulted in positive outcomes for Mid-Atlantic vessels, with profit increases between 0.3% and 12%.

Under the Alt. 4 (Preferred), the vessel impacts and the location of vessels affected vary by scenario. Most of the impacts occur on vessels in ports between East of Cape Cod and New Jersey during the pre-trigger phase (Alt. 4-Pre), but, when the CGOMCCA, ECCCCA, and CCSECCA are closed (Alt. 4-Both), the impacts extend up to Maine. Under Alt. 4-Pre, profits of affected vessels are reduced from 2-9% due to the pinger expansion and the closure of the MSMA. The pinger expansion may result in costs from purchasing pingers or profit reductions when vessels do not to fish in areas requiring pingers. Some vessels, such as those in New Jersey, are affected only by the closure of the MSMA, while others, such as those in New York, may be affected by both the pinger expansion and closure. For vessels from New Jersey and New York, moving from Alt. 4-Pre to any of the closure scenarios (i.e., Alt. 4-GOM, Alt. 4-SNE and Alt. 4-Both) leads to the same or a smaller percentage of vessels affected as these vessels only incur the cost of purchasing pingers once during the Alt. 4-Pre phase. Closure of the CGOMCCA (Alt. 4-GOM) has a greater impact on profits of small vessels than larger vessels, while closure of the CCSECCA (Alt. 4-SNE) tends to have a slightly greater impact on larger vessels compared to smaller vessels.[12]

#### 4.2.2.2 Regional Impacts

Differential impacts also occur among alternatives when these are evaluated at the regional or port group level. This level of analysis assists in the identification of ports that may be more vulnerable to indirect affects from the alternatives. The results suggest a larger overall impact from closures on port groups in the Northeast (Alt. 2, Alt. 4-GOM, Alt. 4-SNE, Alt. 4-Both, Alt. 5-Both), and on the Mid-Atlantic port groups from pinger expansions (Alt. 3, Alt. 4-Pre, Alt-5-Pre).

Relative to the percentage of vessels affected in a port group (Table 4-8), impacts shift north and south with alternatives. Under any of the closure alternatives (Alt. 2, Alt. 4-GOM, Alt. 4-SNE,

[12] The profit reductions for vessels in New York and New Jersey under closure of the CGOMCCA are largely due to closure of the MSMA as well.

Alt. 4-Both, Alt. 5-Both), a large percentage of the vessels in the northern port groups from Maine to New Jersey are affected. The expansion of pinger requirements (Alt. 3, Alt. 4-Pre, Alt. 5-Pre) most affected vessels in ports from East of Cape Cod to North Carolina, as most of these vessels did not previously have pingers. Alt. 5-Both is the only alternative to affect vessels from Maine to North Carolina, and affects the largest percentage of vessels. The 40% of New Jersey vessels affected by all the alternatives except Alt. 3 reflects the impacts of the MSMA closure.

A similar north-south pattern is evident in landings (and thus effort) by port group (Table 4-9). However, the overall impact on landings is relatively small considering the number and proportion of vessels affected under any of the alternatives. The largest impact on landings occurs in ports in NH from closure of the CGOMCCA (Alt. 2, Alt. 4-GOM, Alt. 4-Both, Alt. 5-Both) with a reduction in gillnet landings of 14% (215 mtons). Ports in the South of Cape Cod and North of Boston experience similar declines in landings, although for different reasons. North of Boston experience losses of 6-8% (206-258 mtons) from northern closures (Alt. 2, Alt. 4-GOM, Alt. 4-Both, Alt. 5-Both), while South of Cape Cod ports experience losses of 6% (221 mtons) with southern closures (Alt. 2, Alt. 4-SNE, Alt. 4-Both and Alt. 5-Both). The impacts for Alt. 3, Alt. 4-Pre and Alt. 5-Pre are all small in terms of landings, as vessels either purchase pingers or they fish outside pinger areas.

Changes in gillnet revenues closely match those in landings, in both scale and affect (Table 4-10). Alternatives that close the CGOMCCA (Alt. 2, Alt. 4-GOM, Alt. 4-Both, Alt. 5-Both) reduce NH revenues by 11%, or approximately $293,000. Alternatives that close the CCSECCA and ECCCCA (Alt. 2, Alt. 4-SNE, Alt. 4-Both, Alt. 5-Both) reduce gillnet revenues in South of Cape Cod ports by 10% ($734,000). Alternatives that close all consequence areas (Alt. 2, Alt. 4-Both, Alt. 5-Both) reduce North of Boston gillnet revenues by 7% ($524,000). Overall, at the port group level, the decline in revenues from any of the alternatives is generally 5% or less and below $400,000.

**Table 4-8: Status quo number of vessels by port group and percent of vessels affected under alternatives.**

| | | Percent of vessels affected by alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Status quo vessels | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 55 | 23 | | | 23 | | 23 | | 23 |
| New Hampshire | 34 | 62 | | | 62 | | 62 | | 62 |
| North of Boston | 122 | 66 | | 2 | 58 | 25 | 66 | 2 | 66 |
| South of Boston | 28 | 23 | | | | 23 | 23 | | 23 |
| East of Cape Cod | 59 | 57 | 52 | 52 | 34 | 87 | 87 | 52 | 87 |
| South of Cape Cod | 100 | 68 | 8 | 9 | 5 | 70 | 70 | 9 | 70 |
| New York | 78 | 7 | 41 | 30 | 9 | 16 | 16 | 30 | 16 |
| New Jersey | 88 | 40 | 55 | 40 | 40 | 40 | 40 | 40 | 40 |
| Delaware/Maryland | 19 | | 100 | | | | | 86 | 86 |
| Virginia | 60 | | 59 | | | | | 59 | 59 |
| North Carolina | 332 | | 88 | | | | | 100 | 100 |

**Table 4-9: Status quo landings (mtons) by port group and percent change under alternatives.**

| | | Percent change in landings by alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Status quo landings (mtons) | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 1,378 | -2 | | | -2 | | -2 | | -2 |
| New Hampshire | 1,543 | -14 | | | -14 | | -14 | | -14 |
| North of Boston | 3,254 | -8 | | <+1 | -6 | -2 | -8 | <+1 | -8 |
| South of Boston | 439 | <-1 | | | | <-1 | <-1 | | <-1 |
| East of Cape Cod | 4,359 | -2 | <+1 | <+1 | <+1 | -2 | -2 | <+1 | -2 |
| South of Cape Cod | 3,873 | -6 | <-1 | <-1 | <-1 | -6 | -6 | <-1 | -6 |
| New York | 908 | -3 | <-1 | <-1 | <-1 | -3 | -3 | <-1 | -3 |
| New Jersey | 3,282 | -1 | <+1 | <-1 | -1 | <-1 | -1 | <-1 | -1 |
| Delaware/Maryland | 337 | | -1 | | | | | 3 | 3 |
| Virginia | 659 | | <+1 | | | | | <+1 | <+1 |
| North Carolina | 3,246 | | 1 | | | | | <+1 | <+1 |

**Table 4-10: Status quo revenues ($ '000) by port group and percent change under alternatives.**

| | Status quo revenues ($ '000) | Percent change in revenues by alternative | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Alt. 2 | Alt. 3 | Alt. 4-Pre | Alt. 4-GOM | Alt. 4-SNE | Alt. 4-Both | Alt. 5-Pre | Alt. 5-Both |
| Maine | 2,440 | -1 | | | -1 | | -1 | | -1 |
| New Hampshire | 2,756 | -11 | | | -11 | | -11 | | -11 |
| North of Boston | 7,263 | -7 | | <-1 | -5 | -2 | -7 | <-1 | -7 |
| South of Boston | 1,140 | < -1 | | | | < -1 | < -1 | | < -1 |
| East of Cape Cod | 5,407 | -4 | <-1 | <-1 | <-1 | -4 | -4 | <-1 | -4 |
| South of Cape Cod | 7,646 | -10 | <-1 | -1 | <-1 | -10 | -10 | -1 | -10 |
| New York | 1,857 | -4 | -4 | -3 | -1 | -4 | -4 | -3 | -4 |
| New Jersey | 6,730 | -1 | -2 | -1 | -1 | -1 | -1 | -1 | -1 |
| Delaware/Maryland | 867 | | -2 | | | | | 4 | 4 |
| Virginia | 850 | | -3 | | | | | 1 | 1 |
| North Carolina | 3,688 | | -2 | | | | | < +1 | < +1 |

#### 4.2.2.3 Industry

As indicated previously, data from 2006 on vessel distributions by size class and port group were used to extrapolate model impacts to the industry level.

Industry impacts vary by alternative (Table 4-11). Under Alt. 5, some of the vessels experience a positive impact on revenues, but under all the other alternatives, vessels are negatively affected (Table . With respect to the other alternatives, Alt. 3 affects the largest percentage of vessels (48%) while Alt. 4-Pre affects the smallest percentage (10%), even though both alternatives have small and similar impacts on landings and revenues (<±1%). Within an alternative, impacts on landings and revenues are similar in percentage terms. Reductions in landings range from less than 1% (Alt. 4-Pre, Alt. 5-Pre) to 4% (Alt. 2, Alt. 4-Both, Alt. 5-Both), while the greatest reduction in revenues is 5% (Alt. 2, Alt. 4-Both, Alt. 5-Both). Annual declines in landings are from 6 mtons (Alt. 4-Pre) to 849 mtons (Alt. 2). Annual declines in revenue are from $127,000

per year for Alt. 5-Pre to around $1.9 million for Alt. 2, Alt. 4-Both and Alt. 5-Both. Closure of the CCSECCA and ECCCCA (Alt. 4-SNE) has the largest impact on landings and revenues.[13]

**Table 4-11: Industry level estimates of percent of vessels affected and percent change from Status Quo in landings, revenues and bycatch under the alternatives.**

| | **Vessels** | | **Landings** | | **Revenues** | | **Bycatch Estimate** | |
|---|---|---|---|---|---|---|---|---|
| | *#* | | *mtons* | | *$ '000* | | *animals* | |
| Status Quo (2006) | 975 | | 23,276 | | 40,643 | | 1,063 | |
| | ***Affected:*** **Vessels** | | ***Change in:*** **Landings** | | **Revenues** | | **Economic Bycatch** | |
| | *#* | *%* | *mtons* | *%* | *$ '000* | *%* | *animals* | *%* |
| Alt. 2 | 263 | 27 | -849 | -4 | -1,947 | -5 | -573 | -54 |
| Alt. 3 | 464 | 48 | 52 | <+1 | -374 | <-1 | -643 | -60 |
| Alt. 4-Pre | 101 | 10 | -6 | <-1 | -183 | <-1 | -622 | -59 |
| Alt. 4-GOM | 171 | 18 | -466 | -2 | -815 | -2 | -668 | -63 |
| Alt. 4-SNE | 206 | 21 | -378 | -2 | -1,218 | -3 | -642 | -60 |
| Alt. 4-Both | 290 | 30 | -838 | -4 | -1,956 | -5 | -671 | -63 |
| Alt. 5-Pre | 485 | 50 | 10 | <+1 | -127 | <-1 | -627 | -59 |
| Alt. 5-Both | 673 | 69 | -821 | -4 | -1,901 | -5 | -673 | -63 |

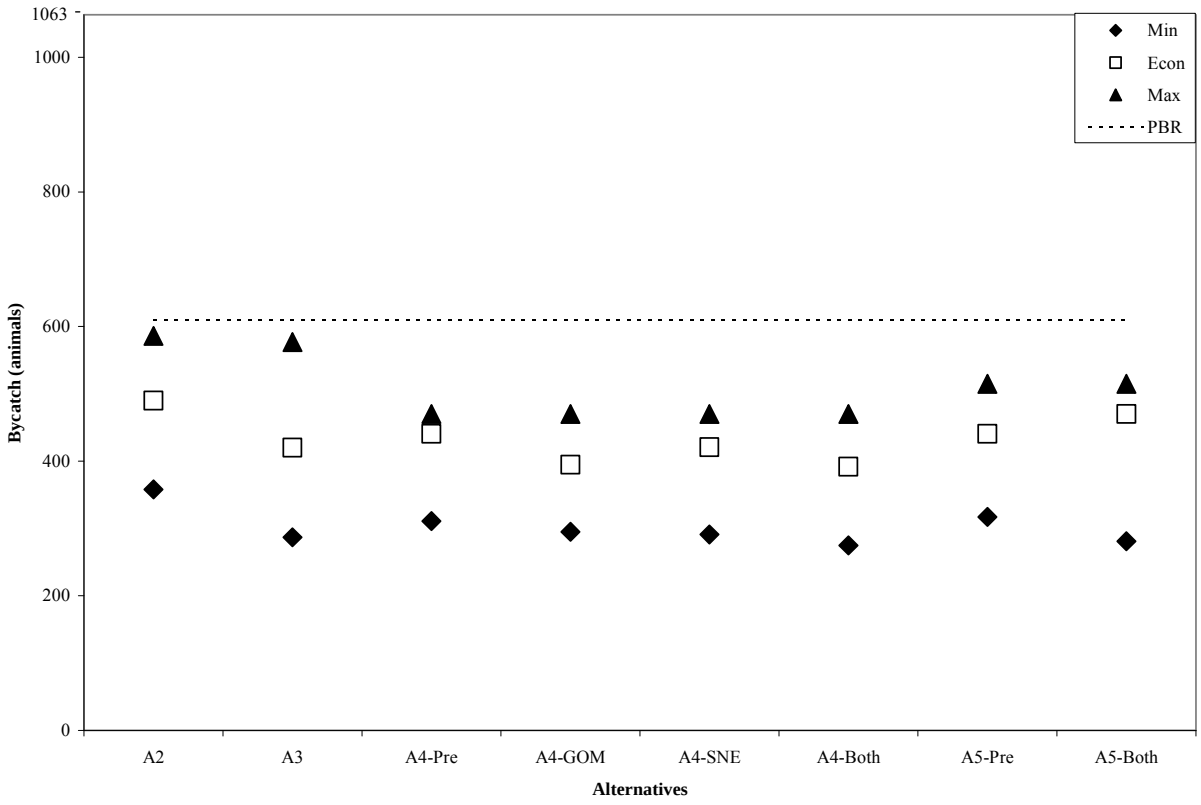
The "economic bycatch" was estimated using the status quo bycatch and reducing it by the percent decline in bycatch by season and area predicted with the landings from the model, and the bycatch rate used to estimate the maximum bycatch for each alternative (Section 4.1.1, Biological Effects of the Alternatives on Harbor Porpoises). Changes in bycatch using the "economic bycatch" differed little among the alternatives (Table 4-11). Estimated bycatch reductions ranged from 54% to 63%, reflecting a reduction of 573-673 animals from the original bycatch estimate of 1,063 animals.[14] The "economic bycatch" estimate consistently falls between the minimum and maximum bycatch estimates (Figure 4-1). Thus, based on the economic modeling results, it seems that the proposed management measures (Alt. 4) will result in bycatch nearer to the maximum estimated than the minimum.[15]

[13] The higher values for Alt. 2, Alt. 4-Both and Alt. 5-Both are due to the combination of closures.

[14] This results in an "economic bycatch" estimate of 390-490, all less than PBR.

[15] The maximum bycatch estimate under Alt. 4-Pre assumes fishing effort will remain the same and not all vessels will be compliant with pinger requirements. The "economic bycatch" estimate uses this bycatch rate with mixed pinger compliance as well as the very small reductions in effort (<1%) from the economic model. The use of a bycatch rate that assumes some non-compliance is offered as a worst case or maximum scenario (Section 4.1.1); however, given the consistent evidence of non-compliance since shortly after the inception of the first HPTRP (Palka et al., 2008a) this may be a more realistic scenario.

**Figure 4-1: The minimum and maximum harbor porpoise bycatch estimates compared to the "economic bycatch" estimates by alternative. PBR is 610 animals.**




However, the annual impacts discussed above provide only a partial picture of the economic impacts of the alternatives. For both Alt. 4 and Alt. 5, closure of the consequence areas is not possible until year three and may never be implemented. To address the temporal differences in the impacts of the alternatives, the cost-effectiveness analysis was conducted using a ten-year time horizon. Costs in future years were discounted using rates of 3% and 7% to illustrate the rate of appropriate discount rates (Office of Management and Budget, 2003). Discount rates are used, as a dollar now does not have the same value as a dollar in the future. The discounted annual costs were summed to provide an estimate of the total Present Value of Cost (PVC) over the entire ten-year period (Table 4-12). Various assumptions are incorporated to account for differences in implementation of the alternatives. For example, under Alt. 3, vessels that purchased pingers were charged the full cost in the first year; thus, in future years, the primary cost was the lost revenues for vessels that did not purchase pingers. In contrast, under Alt. 4 and Alt. 5, the various closures could occur in any year after the second year; for example, the CGOMCCA could close in year three or year ten, with implications for the total PVC. While combinations of closures are possible (e.g., the CGOMCCA closes in year three and the CCSECCA and ECCCCA close in year five), only straight versions of the closures were considered in the analysis.

The total PVC does not change for alternatives that are fully implemented in the first year (Alt. 2 and Alt. 3) or in the case where consequence closures are never triggered in Alt. 4 and Alt. 5

(Table 4-12). However, for the alternatives with trigger actions (i.e., Alt. 4 and Alt. 5), the earlier a closure is implemented, the higher the total PVC over the ten-year period. This occurs because the cost of a closure is higher than the cost of pinger implementation, so delaying the onset or triggering of a closure lowers the total cost.

**Table 4-12: Present value of costs for alternatives based on year that closures are triggered ($ '000) using (A) a 3% discount rate and (B) a 7% discount rate.**

**(A) 3% discount rate**

| Year Closure Triggered | Alt. 2 | Alt. 3 | Alt. 4 Never trigger | Alt. 4 GOM | Alt. 4 SNE | Alt. 4 Both | Alt. 5 Never trigger | Alt. 5 Both |
|---|---|---|---|---|---|---|---|---|
| 3 | 17,105 | 1,043 | 770 | 5,810 | 8,558 | 13,585 | 285 | 13,100 |
| 4 | 17,105 | 1,043 | 770 | 5,113 | 7,481 | 11,813 | 285 | 11,327 |
| 5 | 17,105 | 1,043 | 770 | 4,436 | 6,435 | 10,092 | 285 | 9,607 |
| 6 | 17,105 | 1,043 | 770 | 3,779 | 5,420 | 8,421 | 285 | 7,936 |
| 7 | 17,105 | 1,043 | 770 | 3,141 | 4,434 | 6,799 | 285 | 6,314 |
| 8 | 17,105 | 1,043 | 770 | 2,522 | 3,477 | 5,225 | 285 | 4,739 |
| 9 | 17,105 | 1,043 | 770 | 1,921 | 2,548 | 3,696 | 285 | 3,210 |
| 10 | 17,105 | 1,043 | 770 | 1,337 | 1,646 | 2,211 | 285 | 1,726 |

**(B) 7% discount rate**

| Year Closure Triggered | Alt. 2 | Alt. 3 | Alt. 4 Never trigger | Alt. 4 GOM | Alt. 4 SNE | Alt. 4 Both | Alt. 5 Never trigger | Alt. 5 Both |
|---|---|---|---|---|---|---|---|---|
| 3 | 14,631 | 934 | 674 | 4,801 | 7,051 | 11,168 | 259 | 10,753 |
| 4 | 14,631 | 934 | 674 | 4,155 | 6,053 | 9,526 | 259 | 9,110 |
| 5 | 14,631 | 934 | 674 | 3,552 | 5,120 | 7,991 | 259 | 7,575 |
| 6 | 14,631 | 934 | 674 | 2,987 | 4,249 | 6,556 | 259 | 6,141 |
| 7 | 14,631 | 934 | 674 | 2,460 | 3,434 | 5,215 | 259 | 4,800 |
| 8 | 14,631 | 934 | 674 | 1,967 | 2,672 | 3,962 | 259 | 3,547 |
| 9 | 14,631 | 934 | 674 | 1,507 | 1,961 | 2,791 | 259 | 2,376 |
| 10 | 14,631 | 934 | 674 | 1,076 | 1,296 | 1,697 | 259 | 1,282 |

To compare the alternatives on a cost-effectiveness basis, the annual reductions in harbor porpoise bycatch (identified above) were summed over the ten-year horizon and the total PVC divided by the total reduction in bycatch (Table 4-13). This allows for comparisons where the outcome (i.e., reduction in bycatch) differs between alternatives; for example, if a higher cost alternative had a higher reduction in bycatch, it could have a lower cost per unit reduction in bycatch than a lower cost alternative with a lower reduction in bycatch. Alt. 2 is the highest cost alternative under any scenario. Comparison of the other alternatives is more difficult as there is considerable uncertainty surrounding many values in this analysis, and thus values that are close to each other (i.e., Alt. 3, Alt. 4-Never trigger, and Alt. 5-Never trigger) are likely indistinguishable. The uncertainty of when or if closure of the consequence areas will be triggered makes it difficult to fully compare Alt. 4 and Alt. 5 when there are closures. However, it is clear that costs can be lowered by actions that delay the implementation of closures. For example, the PVC per animal is $352 for Alt. 4-Both if the closures occur in year ten as opposed to $2, 054 if the closure occurs in year three when a 3% discount rate is used (Table 4-13 A).

**Table 4-13: Present value of cost per unit reduction in bycatch ($ per animal) using (A) a 3% discount rate and (B) a 7% discount rate.**

**(A) 3% discount rate**

| Year Closure Triggered | Alt. 2 | Alt. 3 | Alt. 4 Never trigger | Alt. 4 GOM | Alt. 4 SNE | Alt. 4 Both | Alt. 5 Never trigger | Alt. 5 Both |
|---|---|---|---|---|---|---|---|---|
| 3 | 2,985 | 162 | 124 | 882 | 1,341 | 2,054 | 45 | 1,973 |
| 4 | 2,985 | 162 | 124 | 781 | 1,176 | 1,799 | 45 | 1,718 |
| 5 | 2,985 | 162 | 124 | 683 | 1,014 | 1,549 | 45 | 1,468 |
| 6 | 2,985 | 162 | 124 | 586 | 857 | 1,302 | 45 | 1,221 |
| 7 | 2,985 | 162 | 124 | 490 | 703 | 1,059 | 45 | 978 |
| 8 | 2,985 | 162 | 124 | 396 | 553 | 820 | 45 | 740 |
| 9 | 2,985 | 162 | 124 | 304 | 407 | 585 | 45 | 505 |
| 10 | 2,985 | 162 | 124 | 213 | 264 | 352 | 45 | 273 |

**(B) 7% discount rate**

| Year Closure Triggered | Alt. 2 | Alt. 3 | Alt. 4 Never trigger | Alt. 4 GOM | Alt. 4 SNE | Alt. 4 Both | Alt. 5 Never trigger | Alt. 5 Both |
|---|---|---|---|---|---|---|---|---|
| 3 | 2,554 | 145 | 108 | 729 | 1,105 | 1,688 | 41 | 1,620 |
| 4 | 2,554 | 145 | 108 | 635 | 951 | 1,451 | 41 | 1,382 |
| 5 | 2,554 | 145 | 108 | 546 | 807 | 1,226 | 41 | 1,157 |
| 6 | 2,554 | 145 | 108 | 463 | 672 | 1,014 | 41 | 945 |
| 7 | 2,554 | 145 | 108 | 384 | 545 | 812 | 41 | 744 |
| 8 | 2,554 | 145 | 108 | 309 | 425 | 622 | 41 | 554 |
| 9 | 2,554 | 145 | 108 | 239 | 313 | 442 | 41 | 374 |
| 10 | 2,554 | 145 | 108 | 172 | 208 | 270 | 41 | 203 |

## 4.3 Cumulative Effects Analysis

### 4.3.1 Introduction to Cumulative Effects

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) to evaluate the total effects of many actions over time that would be missed by evaluating each action individually. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective. Rather, the intent is to focus on those effects that are truly meaningful. This section analyzes the potential direct and indirect effects of the Proposed Action (summarized in Section 2.2.4) together with past, present, and reasonably foreseeable future actions as well as factors external to the HPTRP that affect the baseline described in Section 3.0. Although predictions of synergistic effects from multiple sources are inherently less certain than predicted effects of individual actions, cumulative effects analyses are intended to alert decision makers to potential "hidden" consequences of the Proposed Actions.

The information presented in Section 3.0 (Affected Environment) describes the natural history, harbor porpoise bycatch history, current status of harbor porpoises, the New England and Mid-Atlantic gillnet fisheries, and the natural resources and human environment. Section 3.0 provides the environmental baseline and serves as a starting point for this cumulative effects analysis. The cumulative past effects of the HPTRP, combined with impacts from other fisheries regulations, human-induced impacts, and climatic events influencing the resources, all contribute to the current state of the baseline condition.

The purpose of this section is to assess the cumulative effects of Alternative 4 (Preferred) on the environment when added to other past, present and reasonably foreseeable future actions. Particularly, this analysis considers cumulative impacts on (1) harbor porpoise bycatch, (2) bycatch of other protected species, (3) gillnet effort, and (4) human communities including the economics of the gillnet fisheries and associated fishing communities. These elements represent those for which a reasonable likelihood of meaningful impacts is expected, and that have historically been impacted by protected species regulations affecting fishing. These are also components that must be assessed according to the statutory requirements of the MMPA, Magnuson-Stevens Fishery Management and Conservation Act (MSFCMA), ESA, Regulatory Flexibility Act (RFA), and several Executive Orders. Table 4-14 summarizes those past, present or reasonably foreseeable future actions that have some effect on these elements.

**Scope**

The geographic scope of the cumulative effects analysis is based on the seasonal distribution of the GOM/BOF stock of harbor porpoises within U.S. waters over the continental shelf from the northern GOM south to the North Carolina/South Carolina border (Section 3.1). Temporally, the baseline analysis considers primarily the period since implementation of HPTRP, effective January 1, 1999, through May 2007 (the latest month for which data are available) to demonstrate the changes to resources and the human environment that have resulted through management under the HPTRP and Fishery Management Council processes. Additionally, the

effects of the proposed modifications of the HPTRP on harbor porpoises, protected species, and gillnet fisheries over the next ten years have been evaluated.

Gillnet gear is regulated by some of the measures of the Atlantic Large Whale TRP (ALWTRP), the Bottlenose Dolphin TRP (BDTRP), and the Sea Turtle Gillnet Regulations. Additionally, gillnet effort is managed under the Multispecies Fishery Management Plan (FMP), the Monkfish FMP, and the Dogfish FMP. Harbor porpoises may also be affected by the herring fishery, since it competes for an important prey item. This section discusses the cumulative effects of ongoing actions, including management actions associated with these fisheries, on harbor porpoises, other protected species, gillnet fisheries, and fishing communities.

The cumulative effects of the actions discussed below on essential fish habitat (EFH) are believed to be minimal and the effects on right whale critical habitat are believed to be negligible. No studies have been conducted on the effects of sink gillnets on benthic habitats (see review of available scientific information in Stevenson et al., 2004). However, the direct habitat impacts of this gear have been evaluated by two panels of experts. The first group, convened in October of 2001 to assess the impacts of different types of bottom-tending gear used in the Northeast Region, concluded that sink gillnets and longlines "cause some low degree impacts in mud, sand, and gravel habitats" (NEFSC, 2002). They noted that anchored gillnets still move around over the bottom to some extent and that direct effects could include alteration of physical structure and injury or death of emergent epifauna such as sponges, bryozoans, tunicates, or soft corals. The second workshop was held in March of 2002 with the purpose of evaluating bycatch and habitat damage for ten classes of fishing gear used in U.S. waters. Based on the judgment of the workshop participants and responses provided in a follow-up mail survey, the physical habitat impacts of sink gillnets were ranked as medium and the biological impacts as low on a scale that ranged from very low to very high (Morgan and Chuenpagdee, 2003). Impacts cited in the report were very similar to those noted in the first workshop, i.e., the breaking or uprooting of structures and organisms in strong currents or when the gear is hauled out of the water. Based on this information, any adverse impacts associated with the use of sink gillnets in the Northeast Region are expected to be minimal, except in gravel or rocky areas with emergent epifauna.

Structures that support copepod and plankton abundance (resources that provide the habitat's value to right whales) are not likely to be affected by gillnets. Additionally, none of the measures relevant to the cumulative effects of the proposed modifications to the HPTRP are likely to modify fishing practices in a manner that would adversely affect EFH, Habitat Area of Particular Concern (HAPC), right whale critical habitat, or the habitat of harbor porpoises and other protected or listed marine species.

### 4.3.2 Past, Present, and Reasonably Foreseeable Future Actions

#### 4.3.2.1 Non-Fishing Actions and Activities

There are several ongoing, non-fishing actions that could potentially impact harbor porpoises. These activities include chemical (e.g., pesticides and oil pollution), biological (e.g., invasive species and pathogens), and physical (e.g., dredging, disposal, and coastal development). These

also include disturbances to riverine, inshore bays, nearshore, and offshore habitat, climate change, and energy projects such as liquid natural gas (LNG) facilities and windfarms (only two windfarms have been formally proposed in New England, though others may be proposed in the future). LNG facilities are currently planned or under construction for the following locations: Passamaquoddy, ME (onshore); offshore of Boston, MA; Gloucester, MA; Fall River, MA (onshore); north shore of Long Island , NY (onshore); south shore of Long Island (onshore); Logan Township, NJ (onshore); Philadelphia, PA (onshore); and Cove Point, MD (expansion of an existing facility). The majority of these activities tend to affect inshore or nearshore areas and the impacts are often localized.

Harbor porpoises are a ubiquitous species that can be found from nearshore waters to the continental shelf edge. They migrate seasonally according to prey availability. Because harbor porpoises are not known to be dependent upon any particular biological, physical, or habitat requirements during any life stage, the impacts to this species of non-fishing activities such as oil pollution, dredging activities, and coastal development are likely localized, and minimal to the population as a whole.

#### 4.3.2.2 Protected Species Management Actions and Activities

**HPTRP**

Section 1.2 describes the history of past and present fishery management actions under the HPTRP, as well as those other MMPA and MSFCMA measures implemented specifically to reduce harbor porpoise bycatch. The regulations implementing the current HPTRP became effective January 1, 1999 (63 FR 66464, December 2, 1998), and were slightly amended in 2001 (66 FR 2336, January 11, 2001). The GOM component of the HPTRP (50 CFR 229.33) manages commercial sink gillnet gear or gillnet gear capable of catching multispecies through time and area regulations from Maine to Rhode Island during the months of August through May. This consists of seasonal gillnet closures during the months of the year during which harbor porpoises are most concentrated in four of six established GOM management areas. During several other times of the year, the HPTRP management areas require the use of acoustic deterrent devices, known as pingers, on all sink gillnet gear. Pingers are placed every 300 feet on a string of gillnets and broadcast a ten kilohertz (kHz) sound at 132 decibels every four seconds to alert and/or deter harbor porpoises. Before using pingers on gillnet gear inside HPTRP management areas, fishing vessel operators must complete pinger training administered by NMFS to review the current HPTRP management measures and ensure that pingers are properly deployed and maintained.

The Mid-Atlantic component of the HPTRP (50 CFR 229.34) manages commercial gillnet fishing through time and area regulations from New York to North Carolina from January through April. In lieu of pinger requirements, the Mid-Atlantic component of the HPTRP established large and small mesh gear specifications designed to reduce the likelihood of harbor porpoise entanglement. Large mesh gillnets include gillnets with a mesh size of 7 to 18 inches, and small mesh gillnets include gillnets with a mesh size of greater than 5 to less than 7 inches. Gear specification requirements for Mid-Atlantic gillnets include measures specifying a net limit per net string, twine size, net size, number of nets per vessel, and tie-down requirements. The

three management areas of the Mid-Atlantic component of the HPTRP also include seasonal gillnet closures to coincide with high abundances of harbor porpoises.

Prior to the development of the HPTRP, the bycatch estimate of the GOM/BOF stock of harbor porpoises exceeded PBR by more than threefold, with an estimate of 1,500 animals taken per year in U.S. gillnet fisheries between 1994 and 1998 when the annual PBR was 483. After implementation of the HPTRP, harbor porpoise bycatch decreased and remained below PBR until 2004. However, bycatch showed an increasing trend after 2001, and exceeded PBR beginning in 2004 (see Table 1-1). The 2007 SAR indicated that the average annual mortality from 2001 through 2005 was 652 harbor porpoises per year in U.S. fisheries, exceeding the PBR of 610 animals (Waring et al., 2007a). Preliminary bycatch estimates for the period between 2002 and 2006 suggest the mean annual mortality of harbor porpoises in U.S. fisheries rose further, to 866 (D. Palka, pers comm). In summary, while initially successful at reducing harbor porpoise bycatch to below PBR, the existing HPTRP is no longer achieving the mandates of the MMPA.

The HPTRP was not designed to reduce the bycatch of other protected species in gillnet gear, and no reduction has been identified. Compliant gillnet fishermen assumed costs caused by HPTRP requirements such as: acquiring, installing and maintaining pingers; relocation of fishing effort during closures; reduction in fishing effort in the Mid-Atlantic due to gear modification requirements. However, the overall costs of the HPTRP did not cause any discernible reduction in participation in gillnet fisheries in New England or the Mid-Atlantic. Initial costs or reduction in profits may have affected coastal communities supported by gillnet fishermen. The effects of the HPTRP on gillnet fishermen and their communities are difficult to discern within the greater economic impacts caused by regulations implementing the Multispecies, Monkfish, and Dogfish FMPs.

**ALWTRP**

The ALWTRP was implemented by an interim final rule in July 1997 (62 FR 39157, July 22, 1997) to reduce serious injury to or mortality of large whales (right, humpback, fin and minke) due to incidental entanglement in U.S. commercial fishing gear. The ALWTRP has been amended numerous times over the years, most recently to include additional broad gear restrictions in 2007 (72 FR 57104, October 5, 2007). The ALWTRP includes restrictions to gillnet fisheries, including the Northeast sink gillnet fishery, the Southeast Atlantic gillnet fishery, the Southeastern U.S. Atlantic shark gillnet fishery, and the Mid-Atlantic gillnet fishery. Regulations that may affect harbor porpoises include closure of the Cape Cod Bay Restricted Area to anchored gillnet fishing from January 1 through May 15 and the Great South Channel Restricted Gillnet Area from April 1 through June 30, which could affect harbor porpoise interactions favorably if effort is reduced, or unfavorably if effort shifts to areas of higher harbor porpoise abundance. Other gillnet restrictions throughout New England and the Mid-Atlantic include year-round or seasonal gear modifications, such as placement of weak links on gillnet gear designed to allow large whales to break free should they become entangled. These restrictions are not likely to affect harbor porpoises as they lack the strength and size to break free from gillnets. A complete summary of the ALWTRP can be found at: http://www.nero.noaa.gov/whaletrp/.

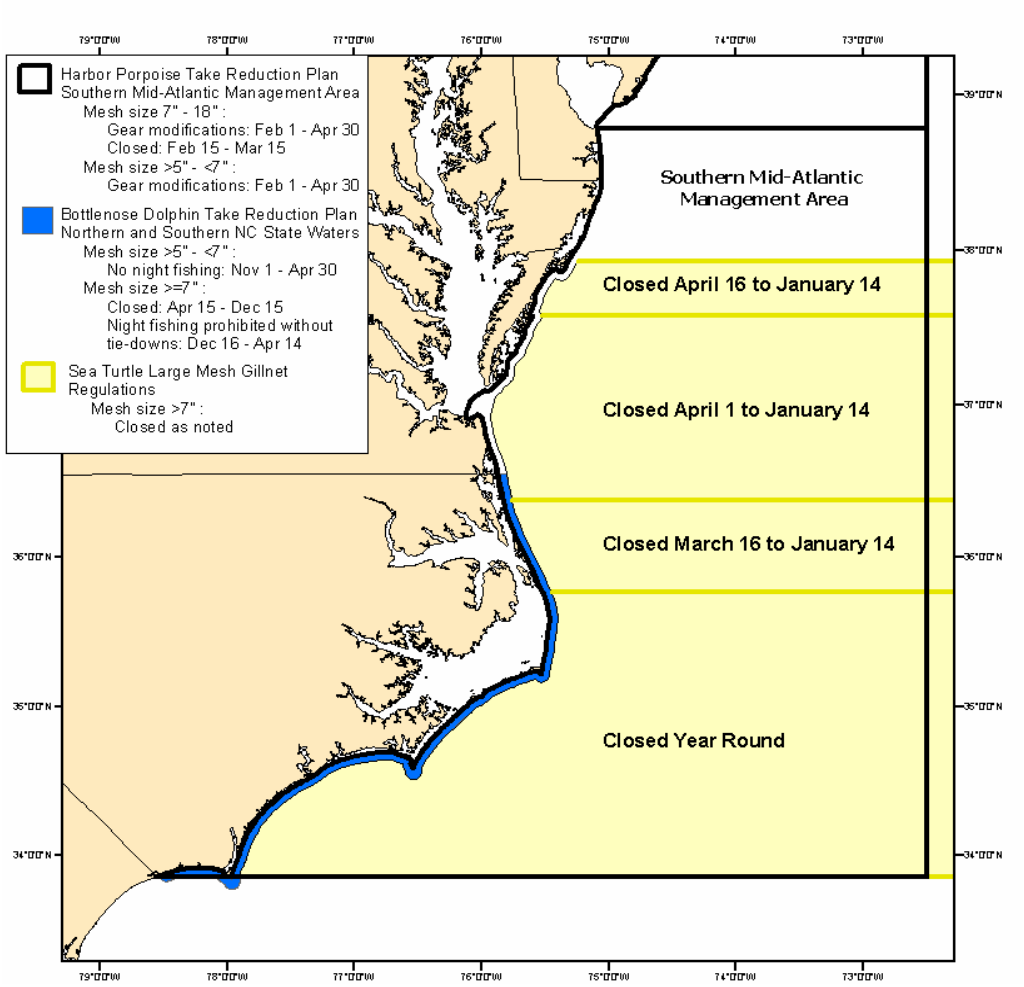
The past, present and reasonably foreseeable future actions of the ALWTRP are expected to be beneficial to large whales. Slightly beneficial, or negligible, impacts are anticipated for harbor porpoises, dolphins, sea turtles, and other protected species. Gillnet effort is not expected to decrease under the ALWTRP for the Northeast and Mid-Atlantic fisheries; however, there are costs to gillnet fishermen in both time and money to modify gear, and to divert effort from restricted areas when gillnet fishing is prohibited. These increased costs may affect fishing communities, particularly in the first few years after implementation of the revised ALWTRP.

**BDTRP**

The BDTRP was implemented by final rule in April 2006 (71 FR 24776, April 26, 2006) to reduce the incidental mortality and serious injury of coastal bottlenose dolphins. The BDTRP includes restrictions to the Mid-Atlantic gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range. The other Atlantic coastal gillnet fisheries managed under the BDTRP include the North Carolina inshore gillnet fishery, Southeast Atlantic gillnet 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, Virginia pound net, and Mid-Atlantic blue crab trap/pot fisheries. The measures contained in the regulations include gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and educational measures to reduce coastal bottlenose dolphin bycatch to below the stock's PBR level.

Figure 4-2 illustrates the seasonal and geographic boundaries of the BDTRP and sea turtle gillnet restrictions within the scope of this EA (that is, within the area and season in which harbor porpoises occur and are managed under the HPTRP). A complete summary of the measures of the BDTRP can be found at: www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm. Essentially, the restrictions occur during warmer water months, when harbor porpoises are not found in Mid-Atlantic waters. For Mid-Atlantic large mesh gillnet fishermen operating in state waters, the BDTRP implements a series of seasonal restrictions from closures in North Carolina waters, to night time removal or gear tending requirements in state waters from Virginia through New Jersey. Similar night time closures or net tending restrictions are required for smaller mesh gillnets from North Carolina to New Jersey.

**Figure 4-2: Management Measures Affecting Harbor Porpoises in the Southern Mid-Atlantic from January through April***




*Note that the measures depicted above do not include all regulations within each management plan, as only the management measures that overlap with the seasonality of the HPTRP in this region were included. For complete descriptions of the regulations, see 50 CFR 229.34, 50 CFR 229.35, 50 CFR 222, and 50 CFR 223.

Since the seasonal distribution of bottlenose dolphins only slightly overlaps the distribution of harbor porpoises, the measures implementing the BDTRP provide only marginal benefits to harbor porpoises. Reduced bycatch of protected species that prefer warmer waters, including sea turtles, is likely to occur under the BDTRP. Negligible impacts to other protected species are expected. By itself, the BDTRP does not substantially reduce gillnet effort within the Mid-Atlantic, although it may increase costs to gillnet fishermen shifting fishing operations outside of state waters or to other seasons.

Revisions to the coastal bottlenose dolphin stock structure are now being incorporated based on recent genetic analyses and satellite tagging data, coupled with photo-identification information. Notable revisions include the redefinition of seasonal management units into distinct coastal and estuarine stocks within the range of the bottlenose dolphin Coastal Morphotype. For example, there are nine new and distinct Atlantic Bay, Sound, and Estuary Stocks defined from North

Carolina through Florida's east coast; coastal stocks off South Carolina and Georgia were combined; and a new migratory coastal stock was defined. A review of the new Atlantic Bay, Sounds, and Estuary stocks can be found in the 2009 Draft Stock Assessment Reports at: http://www.nmfs.noaa.gov/pr/pdfs/sars/ao2009_draft_bottlenose.pdf.

The BDTRT will be assessing the implications of stock structure revisions on the BDTRP to determine what modifications to the BDTRP are needed. Additionally, NMFS recently published a proposed rule to extend for an additional three years, fishing regulations set to expire on May 26, 2009 (73 FR 49634, August 22, 2008). The proposed action was finalized on December 19, 2008 (73 FR 77531) and continues, until May 26, 2012, current nighttime fishing restrictions in North Carolina for gillnet gear with mesh sizes of > 5 to < 7 inches. The measure prohibits fishing at night in North Carolina state waters from November 1 through April 30.

**Sea Turtle Mid-Atlantic Large Mesh Gillnet Restrictions**

In 1995, a dramatic increase in sea turtle strandings in North Carolina and Virginia during April and May was documented. The spring strandings continued, coinciding with increased effort in the monkfish gillnet fishery. In the spring of 2000, 280 sea turtles stranded in two short time periods, coincident with monkfish and dogfish gillnet fishing offshore. Four of the carcasses were carrying gillnet gear measuring 10-12 inches (25-31 cm) stretched mesh, which is consistent with the gear used in the monkfish fishery.

NMFS published an interim final rule effective from March 15 to November 10, 2002, followed by a final rule in December 2002 (67 FR 71895, December 3, 2002), to implement seasonally adjusted closures of portions of the Mid-Atlantic Exclusive Economic Zone (EEZ) offshore of Virginia and North Carolina to gillnets with a mesh size larger than 8 inch (20 cm) stretched mesh. These regulations were revised in 2006 (71 FR 24776, April 26, 2006) to modify the large mesh size restriction to 7 inches (18 cm) stretched mesh or greater, in part for consistency with the HPTRP definition of large mesh gillnet gear (7 – 18 inches, 18 – 46 cm). Figure 4-2 shows the seasons and geographic boundaries of these rolling closures during the period that the HPTRP is in effect. Generally, these rolling closures are associated with sea surface temperatures of 11°C (52° F), reflecting the period in which sea turtles migrate into and through the waters offshore of North Carolina and Virginia.

The seasonally adjusted large mesh gillnet closure may reduce effort in Mid-Atlantic gillnet fisheries, or may divert effort into other times and areas. Coastal bottlenose dolphins and other warm water protected species that overlap in distribution with sea turtles may be beneficially affected by these gillnet restrictions. There is likely a negligible effect, however, on the bycatch of harbor porpoise, large whales and other protected species that occur in cooler waters. Given the small portion of the monkfish fishery that operated in North Carolina and Virginia waters prior to the annual closure, these regulations were not considered to have significant impact on Mid-Atlantic gillnet fishing communities managed under the HPTRP.

#### 4.3.2.3 Fishery Management Plan Actions and Activities

**Northeast Multispecies FMP**

As described in Section 1.2, a number of measures to reduce takes of harbor porpoises in New England gillnets were first implemented under the Northeast Multispecies FMP. These measures were part of a series of major actions undertaken under the FMP since Amendment 5 was implemented in 1994 to reduce fishing effort and rebuild overfished stocks. Amendment 5 also implemented a moratorium on permits, and effort-control program that focused on reducing a vessel's days-at-sea (DAS) by 50% over a 5 – 7 year period. Despite these measures, northeast groundfish stocks continued to decline rapidly. In response, NMFS implemented emergency closures, a number of framework changes, and Amendment 7 to the FMP to implement further effort reduction measures. The combination of Amendments 5 and 7 to the FMP and Framework (FW) 9 reduced fishing effort significantly and provided large areas of year-round protection, especially on Georges Bank, for several species of groundfish. In response, the status of several groundfish stocks improved over several years and landings increased as a result. Following Amendment 7, several framework adjustments were implemented, adding further restrictions to the groundfish fishery. While the combination of all of these measures improved groundfish stock status (increasing biomass and reducing fishing mortality) for many stocks, the improvement was not being achieved for all stocks. In response to a Federal Court decision in the case of *Conservation Law Foundation, et al. v. Evans, et al*., NMFS implemented two interim final rules in 2002 that included a considerable reduction of DAS and increased gear restrictions for certain gear types, including gillnets, hook-gear, and trawl nets. Also included were modifications and additions to the closure areas, limits on yellowtail flounder catch, and more restrictive recreational fishing measures (67 FR 21139, April 29, 2002; 67 FR 50291, August 1, 2002). Amendment 13, implemented on May 1, 2004 (69 FR 22906, April 27, 2004), superseded the settlement agreement and adopted major changes to groundfish management to rebuild overfished stocks, reduce discards, and reduce bycatch of non-target fish species.

Multispecies Framework 40A, implemented November 19, 2004 (69 FR 67780, November 19, 2004), created three opportunities for groundfish vessels to target healthy stocks such as haddock while implementing programs to preserve the Amendment 13 mortality targets, including the establishment of incidental total allowable catches (TACs) for stocks of concern and requiring that the various programs end when these TACs are caught. This was quickly followed by Multispecies Framework 40B, implemented on June 1, 2005, and Framework 41, effective September 14, 2005, to improve the effectiveness of the Amendment 13 effort control program while creating additional opportunities to target healthy stocks and increasing information available to assess groundfish bycatch in the herring fishery. One provision in Framework 40B was the elimination of net limits for gillnet trip vessels. Despite this, any vessels fishing within a seasonal HPTRP management area would still be required to comply with the HPTRP requirements, including pinger requirements in the New England portion and net limit requirements in the Mid-Atlantic portion of the HPTRP.

Despite the management measures of Amendment 13 and subsequent framework actions, fishing mortality in 2004 exceeded Amendment 13 targets for eight stocks. The NEFMC began to develop Framework 42 to continue to reduce fishing mortality and ensure that Amendment 13

rebuilding programs remained on track. However, Framework 42 was delayed and NMFS implemented an interim rule for the beginning of fishing year 2006 that immediately reduced fishing mortality on overfished stocks in the form of differential DAS counting and catch limits until Framework 42 could be implemented. Framework 42 became effective on November 22, 2006, and implemented further effort reduction measures, including differential DAS requirements, and catch limits. Additionally, simplified DAS leasing and transfer programs were implemented. The analysis of effects conducted for Framework 42 concluded that reductions in effort would end overfishing for those stocks that were slow to rebuild while creating new opportunities for groundfish vessels to target healthy stocks. Negligible or beneficial impacts on harbor porpoises and other protected species were forecasted due to anticipated effort reduction. Short-term reductions in revenue were anticipated that would have negative impacts on fishing communities, but over the period of the rebuilding program revenues would increase. However, there was considerable uncertainty over whether current fishery participants would benefit from rebuilding. Framework 42 was determined by the Office of Management and Budget to have significant economic impacts on Northeast Multispecies harvesters.

A further amendment to the Northeast Multispecies FMP, Amendment 16, is currently under development to address further mortality reductions necessary based upon the results of the latest stock assessment in 2008. Amendment 16 was scheduled to be implemented in 2009, but was delayed. As a result, NMFS implemented an interim action in 2009 to eliminate overfishing on all groundfish stocks. Amendment 16 is now anticipated for implementation in 2010. Because several groundfish stocks remain overfished or are rebuilding under programs that do not meet the requirements of the MSFCMA, further effort reduction measures are anticipated. Amendment 16 would continue to reduce effort through DAS allocation reductions and changes to the way DAS are counted, but would also implement effort reductions through the use of hard quotas (annual catch limits) and triggered closure areas in the form of accountability measures and sector management (a form of a catch-share program). There is insufficient information currently available to evaluate the effects of Amendment 16 on other ongoing activities, including the action considered in this EA. A draft Environmental Impact Statement (NEFMC, 2009) evaluating the effects of Amendment 16 indicates that fishing patterns and overall fishing effort, such as times, areas, and fishing gear used, will change as a result of this amendment; however, at this time, it is not possible to make reliable predictions on how these changes will affect harbor porpoises and other protected species. As a result, actual reductions in gillnet fishing effort in areas and periods of harbor porpoise and other protected species presence that may result from measures proposed under Amendment 16 cannot yet be forecasted, as it is not yet known how many vessels would be subject to the DAS effort controls or the sector management provisions. Because sector rosters and operations can change each year, it would be difficult to reliably predict potential impacts on gillnet fishing effort under Amendment 16. Further reductions in revenue are likely to negatively affect fishing communities.

Past, present, and reasonably foreseeable future actions under the Northeast Multispecies FMP may reduce effort in the Northeast multispecies gillnet fishery in a manner that reduces harbor porpoise bycatch, and the bycatch of other marine mammals, sea turtles, and protected species. This action will rebuild groundfish stocks, and therefore will ultimately benefit the groundfish industry. These benefits may not profit current participants, however, and in the near term, negative economic impacts to fishermen and their communities are likely.

**Monkfish FMP**

When the HPTRP was implemented in January 1999, the monkfish fishery was essentially unregulated, although the Northeast and Mid Atlantic Fishery Management Councils (Councils) were developing an FMP under the MSFCMA. Federal management of monkfish began when the Monkfish FMP was implemented in November 1999. The fishery, which includes a large mesh gillnet component, extends from the coast of Maine to North Carolina out to the continental margin. Monkfish are managed as two stocks, with the Northern Fishery Management Area (NFMA) covering the GOM and northern part of Georges Bank, and the Southern Fishery Management Area (SFMA) extending from the southern flank of Georges Bank through the Mid-Atlantic Bight to North Carolina. Monkfish are harvested by trawl, dredge, and gillnet gear.

The Monkfish FMP, developed in response to dealer and fishermen's reports of increased small fish landings, gear conflicts, and an expanded directed trawl fishery, implemented a number of measures to stop overfishing by reducing effort in this fishery. Such measures included limiting the number of vessels with access to the fishery and allocating days-at-sea to those vessels, setting trip limits for vessels fishing for monkfish, minimizing fish size limits, implementing gear restrictions, and requiring a mandatory time out of the fishery during the spawning season. Despite several years of increases in the biomass index for both stocks, in the fall of 2006 both stocks remained overfished under the original biological reference points established by the FMP. As a result, the Councils proposed, in Framework 4 (72 FR 53942, September 21, 2007), to revise the management program so that the goals of the rebuilding plan could be met by 2009, within the ten-year rebuilding schedule. Framework 4 included, among other measures, a "backstop" provision that would adjust, and potentially close, the directed monkfish fishery in 2009 if the landings in Fishing Year (FY) 2007 exceeded the target total allowable catch (TTAC).

NMFS deferred implementation of Framework 4 and called for a monkfish stock assessment for July 2007. The Northeast Data Poor Stocks Working Group (DPWG) completed and accepted the new assessment, which recommended revising the biological reference points. Under the revised reference points, both monkfish stocks are considered "rebuilt" and "overfishing is not occurring." The assessment report (Northeast Data Poor Stocks Working Group, 2007) emphasizes, however, that because this assessment was the first to use a new analytical model, there is a high degree of uncertainty in the analyses due to the dependence on assumptions about natural mortality, growth rates, and other model inputs. Nevertheless, the change in stock status, from overfished to rebuilt, obviated the need to impose further restrictions on the industry to meet rebuilding objectives.

Framework 5 (73 FR 22831, April 28, 2008), effective May 1, 2008, adopted the revised reference points recommended by the DPWG, and implemented measures to reduce the likelihood of harvest overages in FY 2008 and beyond. Framework 6 (73 FR 52635, September 10, 2008), effective October 10, 2008, eliminated the backstop provision adopted in Framework 4. Given the most recent information on the status of the monkfish stocks, as well as the adoption of the revised reference points and other measures implemented by Framework 5 that would reduce the likelihood of overages, the backstop provision was no longer necessary.

Amendment 5 to the Monkfish FMP is currently under development. The primary purpose of this amendment is to bring the FMP into compliance with the new requirements under the MSFCMA, which includes setting annual catch limits (ACLs) and accountability measures (AMs). Additionally, in response to issues raised during the public scoping process, in this Amendment the Councils are considering an option that could reduce the amount of time that gillnet gear is in the water. This option would allow vessels to exceed the monkfish trip limit by one day's limit, provided proper reporting, and the vessel's DAS balance would be charged for the additional trip limit accordingly. While this option would allow vessels the ability to land their catch in less time, it would not result in an overall increase in the amount of fish landed because the vessels' DAS would be charged to account for the one-day worth of additional catch.

The effects of the Monkfish FMP on gillnet effort to date has been ambiguous. Although the FMP establishes harvest limits, presumably constraining fishing effort, a variable level of total landings by gillnet gear occurred between years, and the years with the highest level of landings by gillnets occurred after the FMP was implemented (Figure 7 in Northeast Data Poor Stocks Working Group, 2007). A summary of DAS usage, which primarily reflects effort in the SFMA, indicates relatively steady usage except for low effort years in 2004 and 2006, and a relatively high year in 2005 (NEFMC and MAFMC, 2008).

In summary, the fishery management actions of the Monkfish FMP constrain monkfish gillnet fishing effort in both the Mid-Atlantic and New England compared to the potential pre-FMP unregulated growth. The FMP has a negligible impact or slight benefit on harbor porpoises and other protected species, as constrained gillnet effort may reduce the potential incidental take of harbor porpoises and other protected species. The most recent actions under the FMP will likely have an overall positive effect on monkfish fishing communities in the SFMA since it averts the closure of the directed fishery. Continued stock growth under the proposed measures remains likely, with a more stable fishery and increased community benefits due to larger trip limits forecasted in the future, although no great increase in fishing effort is anticipated.

**Spiny Dogfish FMP**

Like the monkfish fishery, the spiny dogfish fishery was not regulated under an FMP when the HPTRP was first implemented. The fishery developed in the 1990s along the NER, using longlines, trawls, and small mesh (5-7 inches, 13-18 cm stretched mesh) gillnets to harvest the dogfish. In 1992, landings were approximately 37.2 million pounds, but gradually increased to a peak of about 60 million pounds in 1996. Landings declined to an average of around 40 million pounds in the late 1990s. The fishery harvested primarily mature females, resulting in forecasted low recruitment (MAFMC, 2008)

Spiny dogfish were classified as overfished in 1998, resulting in the development of the Spiny Dogfish FMP, implemented in 2000. The FMP essentially ended the directed fishery to halt large scale depletion of reproductively mature female spiny dogfish and allow the stock to recover to a sustainable level. Accordingly, the FMP allowed an incidental catch quota of four million pounds and restricted trip limits during the first year the FMP was in place. Management measures to discourage the development of any meaningful directed spiny dogfish fishery have

been in place in Federal waters since implementation of the FMP (in 2000) and through 2008. Under the FMP and state regulations, landings declined to approximately five million pounds each year in 2001 and 2002. For 2003 and 2004, U.S. commercial landings were 2.6 and 2.2 million pounds, respectively. By 2005, the stock was determined to be not overfished (NEFSC, 2006). In 2009, based on the 2008 stock status update showing that the stock appears not to be overfished and overfishing is not occurring, the federal quota increased from 4 million pounds to 12 million pounds, allowing for a small directed fishery for spiny dogfish.

Framework Adjustment 2 to the FMP published in June 2009. This framework was administrative in nature and revised the current definitions of the stock status determination criteria for spiny dogfish (the process by which updates to status determination criteria are integrated into the management process). Amendment 2 to the FMP is currently underway and will specify mechanisms to set acceptable biological catch (ABC), ACLs, and AMs for spiny dogfish, also part of an Omnibus Amendment. Amendment 3 to the FMP is also currently underway and will most likely be effective for May 1, 2011. Amendment 3 will address several issues to improve the effectiveness of spiny dogfish management including, but not limited to, the following: establishing a Research Set-Aside (RSA) allowance in annual specifications; the possibility of specifying the spiny dogfish quota and trip limits by sex; establishing a limited access permit for spiny dogfish; determining means to acknowledge the recreational fishery for spiny dogfish in the FMP; and alternative allocation schemes for the commercial quota.

State management of spiny dogfish under the ASMFC plan has deviated from the Federal plan in the past. For the 2008 fishing year, the quota in state waters was 8.0 million lbs. and the trip limit was 3,000 lbs (ASMFC, 2007). For the 2009 fishing year, both the ASFMC and NMFS agreed on a 12 million lbs quota and a 3,000 lbs possession limit. The ASMFC has adopted a regional quota allocation, where 58 percent of the quota is allocated to the states from Maine through Connecticut, 26 percent is allocated to New York through Virginia, and 16 percent is allocated to North Carolina. This differs slightly from the Federal quota allocation, divided coastwide into two periods: Period 1 (May 1 through October 31) receives 57.9 percent of the total coastwide quota and Period II (November 1 through April 31) receives 42.1 percent of the total coastwide quota.

Although the Spiny Dogfish FMP initially ended the directed dogfish fishery which likely resulted in reduced small mesh gillnet effort in New England and the Mid-Atlantic, the increase in the quota for the 2009 fishing year from 4 million to 12 million pounds has allowed for a small directed dogfish fishery. Therefore, the Spiny Dogfish FMP may have lead to a reduction in harbor porpoise and other protected species bycatch. No harbor porpoise takes have been documented by fishery observers in small mesh gear since the HPTRP and the Spiny Dogfish FMP were implemented (Palka et al., 2008a) (see Appendix A). The increase in the quota for the 2009 fishing year and resultant small directed dogfish fishery may provide some fiscal relief to small mesh gillnet fishermen; however, any resultant increase in effort could also increase protected species bycatch.

**Herring FMP**

Herring is an important forage species for harbor porpoises as well as most other marine mammals and many seabirds that occur in New England waters. The Herring FMP, implemented in March 1999, establishes annual catch limits distributed across seasons and areas, as well as effort control limits and spawning area closures in an attempt to prevent overfishing of the herring resource. In addition to other management measures, Amendment 1 (72 FR 11252, March 12, 2007) of the Herring FMP attempted to address concerns about localized depletion of herring in the inshore GOM. This measure was developed in recognition of the importance of the seasonal availability of herring to predators like bluefin tuna, harbor porpoises, large whales, and other marine mammals that usually migrate to the inshore GOM to feed on herring and other prey species. Specifically, a seasonal purse seine/fixed gear only area was established during the summer months in response to concerns that mid-water trawlers break up large schools of herring in this area, consequently reducing food availability for these predators. It was believed that these measures would, at a minimum, not increase interactions with protected species beyond the status quo, and might have indirect positive benefits by imposing more controls on the fishery.

In addition to concerns about the effects of the herring fishery as competition for this important prey species, takes of marine mammals have been well-documented in the major gear types currently used in the Atlantic herring fishery. Waring et al. (2007a) indicates purse seines operating in this fishery are known to interact with seal species, while mid-water trawl gear (including paired mid-water trawls) has had documented mortalities of pilot whales and white-sided dolphins, and could be interacting with sea turtles..

Amendments 2 (73 FR 4736, January 28, 2008) and 3 to the Herring FMP are administrative in nature. The NEFMC is in the process of developing Amendments 4 and 5 to the Herring FMP. Amendment 4 will also be administrative in nature, as it is designed to bring the Herring FMP into compliance with the MSFCMA requirements for ACLs and AMs. Amendment 5 is intended to consider several issues, including catch monitoring and reporting, interactions with river herring, access of mid-water trawl vessels in groundfish closed areas, and interactions with mackerel. Amendment 4 is anticipated to be implemented in 2011 and Amendment 5 is anticipated to be implemented in 2011 or 2012.

In all, while the Herring FMP and subsequent Amendments do not affect gillnet fishing effort in New England or Mid-Atlantic waters, they have likely reduced the direct and indirect effects of the herring fishery on harbor porpoises and other protected species. The upcoming amendments, specifically Amendment 5, being considered by the NEFMC have the potential to change the effects of the fishery on harbor porpoises, protected species, gillnet fishermen, or coastal fishing communities.

### 4.3.2.4 Proposed Action

<u>Modifications to the HPTRP</u>

NMFS reconvened the HPTRT in December 2007 to review and discuss the most recent harbor porpoise abundance and bycatch information, and to evaluate additional potential measures that may be necessary to reduce harbor porpoise bycatch back to acceptable levels as required by the MMPA. As detailed in Section 1.2.5.1, a review of observer data indicated that the primary issues contributing to the observed increase in harbor porpoise takes in U.S. fisheries include poor compliance with existing measures and increased bycatch outside of existing management areas. The proposed modifications to the HPTRP, developed through consultation with the HPTRT, respond to these findings by establishing "consequence" closure areas that will be closed to gillnet fishing if bycatch rates exceed specified target bycatch rates that would be achieved with good compliance and by expanding management times and areas to encompass newly identified areas of high harbor porpoise bycatch.

The proposed action, fully detailed in Section 2.2.4, is expected to greatly reduce harbor porpoise bycatch to below PBR well into the future. Concomitant reduction in the take of other protected species is not anticipated. Although there will be costs associated with the proposed modifications to the HPTRP due to diversion of fishing effort to new areas, or acquisition, installation, and maintenance of pingers, gillnet fishermen are not expected to leave the fishery. Therefore, gillnet effort reduction is not anticipated. The economic effects of additional pinger requirements decline after the first year of implementation of the HPTRP modifications as fishermen acquire and achieve facility in the use of pingers and adapt to new fishing locations. However, ongoing costs of new closures (i.e., the Mudhole South Management Area and perhaps the consequence closure areas) coupled with the highly regulated environment that gillnet fishermen in New England and the Mid-Atlantic are working under, contribute to an increasingly difficult work environment for gillnet fishermen and the communities they support.

#### 4.3.2.5 Summary of Cumulative Effects

The cumulative effects of this action, along with the other past, present, and reasonably foreseeable future actions discussed above are likely to substantially reduce the bycatch of harbor porpoises in Northeast and Mid-Atlantic gillnet fisheries, thereby achieving the mandates of the MMPA (Table 4-14). This action is expected to have negligible effects on other marine mammal and listed species found in New England and Mid-Atlantic waters, which will retain the protections afforded by other TRPs and ESA regulations. It is difficult to determine the impacts of HPTRP modifications in the Mid-Atlantic, namely the seasonal Mudhole South Management Area closure period, although small profit reductions are expected. Additionally, costs or reduced profits related to acquiring, installing, and maintaining pingers in New England and identifying and traveling to new fishing grounds during closure periods in both New England and the Mid-Atlantic are expected to be relatively low and should decline over time. However, regulations affecting gillnet fishermen operating under the Northeast Multispecies FMP Amendment 13 and Framework 42 have been determined to have significant economic impacts on fishing communities that depend on the groundfish resource. The imposition of additional regulations under the HPTRP will contribute to a difficult work environment for gillnet fishermen that may affect their communities.

Below a summary is provided of the cumulative effects on each of the biological factors from this action and past, present, and reasonably foreseeable future actions.

Cumulative Effects on Harbor Porpoises

Implementing additional conservation measures for the protection of harbor porpoises will benefit this marine mammal stock. Past actions implemented for the management of gillnet fisheries through various FMPs, such as the Northeast Multispecies, Monkfish, and Dogfish FMPs, have provided harbor porpoises with negligible or slightly positive benefits mostly through gillnet effort reductions (Table 4-14). Prior to implementation of the HPTRP, harbor porpoise conservation measures were developed and implemented under the Northeast Multispecies FMP (Section 1.2.2). However, these measures were unsuccessful at reducing harbor porpoise takes to below the stock's PBR level. Implementation of the current HPTRP measures (63 FR 66464, December 2, 1998) under the MMPA was initially successful in reducing harbor porpoise takes to below PBR; however, takes have recently been rising and are now exceeding PBR. ALWTRP measures may provide harbor porpoises with slight or negligible benefits through certain time/area gillnet closures that overlap with the distribution of harbor porpoises (Table 4-14). The BDTRP and sea turtle protection measures, on the other hand, most likely demonstrate negligible effects on harbor porpoises as measures in place for these species only minimally overlap with the distribution of harbor porpoises when they are present in the Mid-Atlantic region.

All reasonably foreseeable future actions for other TRPs and FMPs described above and in Table 4-14 will most likely have negligible effects on harbor porpoise conservation. However, Amendment 16 under the Northeast Multispecies FMP is currently in development and once implemented, may have positive effects on harbor porpoises if gillnet effort is reduced, perhaps leading to a decrease in harbor porpoise bycatch. Whether or not effort reductions would occur in areas that overlap with harbor porpoise distribution are yet to be determined. Also, the effects of Amendment 16 cannot be reliably predicted at this time, as fishing operations under sectors will most likely not be reflective of past fishing practices. Possible reductions in the number of gillnets in the water through Amendment 5 to the Monkfish FMP may lead to positive effects on harbor porpoises through reductions in gear interactions. The 2009 quota increase for spiny dogfish has resulted in a small directed spiny dogfish fishery which could negatively affect harbor porpoises. However, these effects cannot be quantified at this time. The effects of Amendments 4 and 5 to the Herring FMP on harbor porpoises are unknown at this time; however, they could be positive if the amendments lead to increased prey availability.

Implementation of the proposed HPTRP action will benefit harbor porpoises in that takes in gillnet fisheries would decline to below the stock's PBR level (610 animals). Alternative 4 (Preferred) incorporates many of the HPTRT's recommendations and effectively addresses the two-part problem of takes occurring outside of existing management areas and non-compliance with the existing requirements. The biological impacts of this action, in combination with other past, present, and reasonably foreseeable future actions, are expected to be beneficial to harbor porpoises.

Cumulative Effects on Other Protected Species

The existing HPTRP is specifically designed to address incidental takes of harbor porpoises in Northeast and Mid-Atlantic gillnet fisheries through time/area conservation measures. As such, the benefits of the HPTRP on other protected species are negligible or slightly positive. Similarly, other TRPs, such as the ALWTRP and BDTRP, as well as sea turtle conservation measures, are designed to address fishery interactions with other protected species, and the effects of those measures on those particular species are beneficial (Table 4-14). The relevant FMPs examined here that affect gillnet fisheries may be providing other protected species with negligible or slightly positive benefits, especially through effort reductions or, in the case of dogfish, ending the directed fishery altogether.

Future conservation measures under the Northeast Multispecies FMP's Amendment 16 may demonstrate positive benefits to other protected species in the form of effort reductions, possibly reducing the occurrences of interactions with other protected species (Table 4-14). However, the amount of these reductions cannot yet be quantified as it is unknown how sectors will influence fishing practices. Possible reductions in the number of gillnets in the water through Amendment 5 to the Monkfish FMP may lead to positive effects on other protected species through reductions in gear interactions. The 2009 quota increase for spiny dogfish has resulted in a small directed spiny dogfish fishery which could negatively affect other protected species. However, these effects cannot be quantified at this time. The effects of Amendment 4 and 5 to the Herring FMP on other protected species are unknown at this time; however, they could be positive if the amendments lead to increased prey availability or effort reductions for fisheries that interact with protected species.

Where overlap in the distribution of harbor porpoises and other protected species occurs, the proposed action to amend the HPTRP would have negligible to slightly positive beneficial effects on other protected species. Although effort reductions are not expected to occur, the additional conservation measures of this proposed action (e.g., possible establishment of consequence closure areas in the future, seasonal closure of the Mudhole South Management Area) could benefit other protected species. Therefore, the biological impacts of this action on other protected species, when combined with other past, present, and reasonably foreseeable future actions, are not significant.

Cumulative Effects on New England and Mid-Atlantic Gillnet Effort

The existing HPTRP measures have been in place since 1999. The effects of the HPTRP on New England and Mid-Atlantic gillnet effort at the time of the HPTRP's implementation are presumably higher than they are today, although there may be some slight effort reduction in the Mid-Atlantic region from January through April due to net limits. However, if fishermen choose not to fish within HPTRP management areas, effort has likely been diverted to other areas. Effects of other TRPs, such as the ALWTRP and BDTRP, on gillnet effort is negligible or unknown. Sea turtle conservation measures in the Mid-Atlantic seasonally reduce gillnet effort. The relevant FMPs to the proposed action, including the Northeast Multispecies, Monkfish, and Dogfish FMPs, have had varying effects on New England and Mid-Atlantic gillnet effort. The Northeast Multispecies FMP has reduced groundfish effort in New England, and some of that

effort reduction affects gillnet fisheries. Although the Monkfish FMP has constrained effort, gillnet usage in this fishery has remained fairly stable. The Spiny Dogfish FMP ended the directed fishery on this species from 2000 through 2008 and has thus reduced small mesh gillnet effort (Table 4-14). The increase in the 2009 fishing year quota from 4 million lbs to 12 million lbs has allowed for a small directed fishery for spiny dogfish.

Future conservation measures under other TRPs, such as the ALWTRP and BDTRP, are expected to have negligible or unknown effects on New England and Mid-Atlantic gillnet effort. The effects of the Northeast Multispecies FMP on gillnet effort is unknown at this time. However, Amendment 16 is likely to have negative effects should effort restrictions be placed on the FMP's gillnet component. Other reasonably foreseeable future FMP actions affecting gillnet gear are expected to be negligible or slightly positive due to the 2009 increase in quota for spiny dogfish, leading to a small directed spiny dogfish fishery. The proposed HPTRP action may have negligible or slightly negative effects on fishing effort in New England and the Mid-Atlantic if fishermen decide to leave the fishery (Table 4-14). However, it is believed that if fishermen choose not to fish within the HPTRP management areas, effort would shift to other areas. In summary, the proposed action, in combination with past, present, and other reasonably foreseeable future actions, may result in slight effort reductions when combined with present and future FMP actions. However, the economic impacts are not expected to be significant.

Cumulative Effects on Fishing Communities

Since the current HPTRP measures were implemented in 1999, low impact, negative effects on New England and Mid-Atlantic fishing communities are expected. In New England, effects include increased costs due to the purchase and maintenance of pingers, as well as some costs resulting from a diversion of effort to non-managed areas (Table 4-14). In the Mid-Atlantic, effects of the current HPTRP include increased costs due to effort reductions (limits on the number of nets per string and nets per vessel), as well as displaced effort due to other conservation measures (Table 4-14). The effects of the recent ALWTRP modifications are considered negative due to the costs of complying with the regulations. The BDTRP incorporates measures such as net-tending, nighttime fishing restrictions, and possible effort diversions, leading to negative but low impact effects. Additionally, conservation measures for sea turtles include seasonal closures of negative low impacts. A number of FMPs affect New England and Mid-Atlantic fishing communities. The effort reduction measures of Amendment 13 and Framework 42 of the Northeast Multispecies FMP were determined to have significant cumulative effects on fishing communities. Under the Monkfish and Dogfish FMPs, initial effort reductions have lead to negative impacts; however, positive effects are expected once the stocks are in a rebuilding phase (Table 4-14). For example, the adoption of Framework 6 to the Monkfish FMP and elimination of the backstop provision is anticipated to have a positive effect on the fishing community because it removes the provision to end to the directed monkfish fishery. Additionally, the 2009 quota increase under the Spiny Dogfish FMP has allowed for a small directed spiny dogfish fishery.

Future modifications of the ALWTRP are unknown at this time. The gear research component of the ALWTRP provides a positive impact on fishing communities as it promotes collaboration for developing improved techniques for reducing entanglement risk to large whales. Any future

amendments to the BDTRP have unknown effects on gillnet fishing communities (Table 4-14). Future amendments to the Multispecies FMP, including Amendment 16, which include effort reductions, are expected to have negative effects on the fishing community. However, future benefits due to rebuilding may take place but may not benefit the current participants. For the Monkfish FMP, Amendment 5 is under development, which would bring the FMP into compliance with the new requirements under the MSFCMA and possibly establish an option that could reduce the amount of time that gillnet gear is in the water by allowing vessels the ability to land their catch in less time. While the effects of this action are unknown at this time, effects could be positive if a provision is established that would allow vessels to land their catch in less time. Upcoming amendments (Amendment 2 and Amendment 3) to the Spiny Dogfish FMP are still early in the process and the impacts on the fishing community are unknown at this time.

Impacts on New England and Mid-Atlantic fishing communities from the proposed action are expected to initially be negative. In New England, additional areas requiring pingers are proposed, leading to impacts from the purchase and maintenance of pingers (Table 4-14). Also, implementation of consequence closure areas have the potential to affect fishing communities through reductions in revenues and/or shifts in effort; however, economic effects are lower if the consequence closure areas are never implemented or are implemented later in the ten-year time period examined (Section 4.2.2.3, Industry). These economic effects are not expected to be significant. In the Mid-Atlantic, effects of the proposed action are expected to be negative due to the implementation of a new management area (Mudhole South Management Area) that contains a seasonal closure. Effort is expected to shift to other areas, possibly resulting in increased costs on Mid-Atlantic fishermen in this area (Table 4-14). The combined effects of the proposed action with past, present, and reasonably foreseeable future actions may lead to negative effects on fishing communities, especially for gillnet fishermen affected by the Northeast Multispecies FMP for which recent actions have been determined to be significant. The combined effects of these actions on fishing communities may be significant; however, this depends on a number of factors, including the timing and extent of the implementation of future FMP actions, as well as the timing of the implementation of consequence closure areas under the HPTRP should they be triggered.

**Table 4-14: Summary of the effects of past, present and reasonably foreseeable future management actions**

| | Effects on harbor porpoises | Effects on other protected species | Effects on New England and Mid-Atlantic gillnet effort | Effects on fishing communities |
|---|---|---|---|---|
| **Past and Present Protected Species Management** | | | | |
| Current HPTRP | Positive initially, effectiveness declined over time | Negligible | Slight effort reduction possibly due to limits on number of nets per string in Mid-Atlantic. Closures and pinger requirements likely diverted effort rather than reduced it. | Negative, but low impact. Increased costs for pinger purchase/installation/maintenance and effort diversion in New England. Reduced profit due to effort reduction measures in Mid-Atlantic. |
| ALWTRP | Positive or negligible | Positive | Negligible/unknown. | Negative. Increased costs to comply with recent ALWTRP modifications. |
| BDTRP | Negligible | Positive | Negligible. | Negative, low. Increased costs due to net-tending, nighttime fishing restrictions, and effort diversion. |
| Sea Turtle Mid-Atlantic Gillnet Restrictions | Negligible | Positive | Effort reduced in the Mid-Atlantic, seasonal. | Negative, low. |
| **Past and Present Fishery Management Plan Actions** | | | | |
| Multispecies FMP | Negligible or positive due to effort reduction | Negligible or positive due to effort reduction | Groundfish effort reduction in New England; presumably some of that will be in the gillnet component. | Amendment 13 and FW 42 effort reduction measures were determined to have significant cumulative economic impacts. Ultimate benefits anticipated upon rebuilding, but possibly not to current participants. |
| Monkfish FMP | Negligible | Negligible | Negligible; overall effort constrained but choice of gear not constrained; long-term gillnet effort not reduced. | Negative effects of initial reduction in landings; positive benefits anticipated upon rebuilding and adoption of Framework 6 (removal of backstop provision). |
| Dogfish FMP | Positive due to effort reduction from largely reducing the directed fishery; slightly negative due to small directed fishery resulting from 2009 quota increase | Positive due to effort reduction from largely reducing the directed fishery; slightly negative due to small directed fishery resulting from 2009 quota increase | Reduced effort initially; increase possible in 2009 due to increase in quota. | Negative, short-term, positive benefits anticipated with 2009 quota increase. |

| Table 4-14 (cont'd) | Effects on harbor porpoises | Effects on other protected species | Effects on New England and Mid-Atlantic gillnet effort | Effects on fishing communities |
|---|---|---|---|---|
| **Reasonably Foreseeable Future Protected Species Management** | | | | |
| ALWTRP – research component | Negligible | Negligible | Negligible. | Positive. |
| BDTRP stock identification revision | Negligible | Unknown | Unknown. | Unknown. |
| Multispecies FMP Amendment 16 | Positive if effort reduction occurs in gillnet component of multispecies fishery | Positive; if effort is reduced, bycatch should be reduced | Unknown. Negative if effort reductions occur in gillnet component. | Unknown. Expected to be negative. Ultimate benefits upon rebuilding, but possibly not to current participants. |
| Monkfish FMP Amendment 5 | Positive if fewer gillnets in water | Positive if fewer gillnets in water | Negligible. | Unknown. Positive if provisions enable vessels to land catch in less time. |
| Dogfish FMP | Negligible to slightly negative if effort increase occurs | Negligible to slightly negative if effort increase occurs | Possible increase. | Unknown. Amendments 2 and 3 in early stages of development. |
| Herring FMP Amendments 4 and 5 | Unknown; positive if prey availability increases | Unknown. Positive if prey availability increases and effort is reduced. | Not applicable. Gillnet fisheries not regulated by this FMP. | Not applicable. Gillnet fisheries not regulated by this FMP. |
| **Proposed Action** | | | | |
| New England: expand pinger use period, expand/add management areas. If necessary, establish consequence closure areas | Positive. With other proposed measures in the Mid-Atlantic, will reduce takes to below PBR. | Negligible | Negligible or small effort reduction if gillnet fishermen choose to leave fishery. | Negative: short term increase in cost of pingers and installations. Long term maintenance costs. Costs or reduced profit due to effort diversion |
| Mid-Atlantic: add new management area | Positive. With other proposed measures in New England, will reduce takes to below PBR. | Negligible | Negligible or small effort reduction if gillnet fishermen choose to leave fishery. | Negative due to the increased costs of effort diversion |
| **Summary of Cumulative Effects of Proposed Action in combination with Past, Present and Reasonably Foreseeable Future Actions** | | | | |
| | Positive. Incidental takes of harbor porpoises will be reduced to below PBR. | Negligible or slight positive in conjunction with other protected species management actions. | Effort reduction possible from multispecies management actions. Negligible impacts from monkfish and potential effort increase from dogfish management actions. | There will be added costs to gillnet fishermen, including those fishing under the Northeast Multispecies FMP, in which a determination of significant negative socio-economic impacts under Amendment 13 and FW 42 has been made. |

## 5.0 REGULATORY IMPACT REVIEW/ FINAL REGULATORY FLEXIBILITY ACT ANALYSIS

A Regulatory Impact Review (RIR) fulfills the objective of E.O. 12866 to enhance planning and coordination with respect to new and existing regulations. This section includes an assessment of the costs and benefits of the proposed action and each of the alternatives listed in Section 2.0 relative to the baseline (i.e., what is likely to occur in the absence of the proposed action), in accordance with the guidelines established by E.O. 12866. Although the analysis completed by NMFS shows that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy, the Office of Management and Budget has determined that this action is significant for the purposes of E.O. 12866.

### 5.1 Determination of Significance under E.O. 12866

NMFS guidelines provide criteria to be used to evaluate whether a proposed action is significant. A "significant regulatory action" means any regulatory action that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities.

The gillnet fishery had annual revenues of approximately $40 million in 2006. The proposed action is estimated to have an annual impact between $0.1 and $1.9 million, a reduction of between <1% and 5% of industry revenues.

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.

The Proposed Action is not expected to be inconsistent or interfere with any action taken or planned by another agency. The purpose of the Proposed Action is to reduce the serious injury and mortality of the GOM/BOF stock of harbor porpoises in Northeast and Mid-Atlantic commercial gillnet fisheries to below the PBR level for this stock, as required by the MMPA. NMFS is the Federal agency responsible for development and implementation of the HPTRP. However, Federal, State, and fishery management agency representatives participated on the HPTRT, helping to ensure the HPTRP is consistent with Federal, State and local laws. Additionally, NMFS has forwarded this EA to the Coastal Zone Management Programs in each coastal state to ensure compliance with State land, water use, and natural resource management programs.

3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

The Proposed Action to implement modifications to the HPTRP is unrelated to any entitlements, grants, user fees, or loan programs, and, therefore, cannot be considered significant under the third criterion of E.O. 12866.
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The Proposed Action is being taken pursuant to the mandates of the MMPA to reduce the serious injury and mortality of the GOM/BOF stock of harbor porpoises in Northeast and Mid-Atlantic commercial gillnet fisheries to below the stock's PBR level. The proposed modifications to the HPTRP incorporate routine fishery management tools through expanding the existing seasonal gear modifications, expanding closure areas, and establishing triggers that would compel further management actions (closures). Therefore, no novel legal or policy issues are raised, and the Proposed Action would not be considered significant under the fourth criterion specified in E.O. 12866.

Because none of these criteria apply, NMFS has determined that the Proposed Action taken to modify the HPTRP to reduce harbor porpoise bycatch to levels below PBR is not significant for the purpose of E.O. 12866.

Framework for Analysis

The overall framework for economic analysis is the change in benefits and costs, and ultimately net national benefits (NNB). This analysis focused on direct costs to gillnet fishermen under each of the alternatives with the cost evaluated using a Closed Area Model (CAM) discussed in Section 5. However, for NNB, costs are only part of the analysis, as these must be compared to all future national benefits of the proposed actions.

There is no commercial value associated with harbor porpoises. However, a reduction in harbor porpoise bycatch would result in non-market benefits to the nation if the public valued harbor porpoises. Public values for a non-market species can be measured as willingness-to-pay (WTP) using contingent valuation surveys. There are no recent WTP values for harbor porpoises, although a past study indicated that some of the U.S. public had positive values for harbor porpoise protection (McConnell and Strand, 1997). This suggests that national benefits would accrue from protection, although the benefits cannot presently be accurately monetized for a calculation of net national benefits (i.e., benefits minus costs).

However, a cost-effectiveness analysis was feasible (i.e., cost per harbor porpoise saved). It was assumed that the unknown WTP value of one harbor porpoise saved is equal across the range of protection levels provided by alternatives; this is appropriate given the narrow range of outcomes. The cost-effectiveness estimate used a ten-year time horizon with a 3% discount rate (Office of Management and Budget, 2003) based on 2006 values. The annual reductions in harbor porpoise bycatch were summed over the ten-year horizon and the total Present Value of Costs (PVC) divided by the total reduction in bycatch. This allows for comparisons where the outcome (i.e., reduction in bycatch) differs between alternatives; for example, if a higher cost alternative had a higher reduction in bycatch it could have a lower cost per unit reduction in bycatch than a lower cost alternative with a lower reduction in bycatch.

The following alternatives are proposed and analyzed: 1) Alternative 1 is no action (status quo); 2) Alternative 2 immediately implements additional closures; 3) Alternative 3 extends pinger requirements by time and areas; 4) Alternative 4 (Preferred) immediately expands pinger requirements by time and areas, adds the Mudhole South Management Area within the Waters off New Jersey Management Area, and includes additional "consequence" areas to be closed if bycatch rates exceed those expected when pinger compliance is high; and 5) Alternative 5 slightly modifies Alternative 4 (Preferred) by removing pinger requirements in the Offshore Management Area within the GOM, removing a seasonal large mesh gillnet closure in the Southern Mid-Atlantic Management Area, and incorporating the Northeast Multispecies FMP Western GOM Closure Area into the HPTRP regulations. While each alternative is composed of individual components that may be spatially and temporally separate, the interrelationships between the components require that they be analyzed as a unit.

Industry Impacts

The impact of the proposed Alternatives (2 through 5) compared to Alternative 1 (status quo) reduced industry revenues between 0.3% and 4.8% and affected between 10.3% to 69.1% of vessels in the gillnet fleet. Harbor porpoise bycatch was reduced between 53.9% and 63.3%.

The cost-effectiveness values, in total discounted ten-year costs per unit reduction in bycatch, show Alternative 2 is the highest cost alternative under any scenario (Table 4-12). Comparison of the other alternatives is more difficult as there is considerable uncertainty surrounding all values in this analysis, and thus values that are close to each other (i.e., Alt. 3, Alt. 4-Never trigger, Alt. 5-Never trigger) are likely indistinguishable.

## 5.2 Final Regulatory Flexibility Analysis (FRFA)

The regulatory flexibility analysis is designed to assess the impacts that various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. This analysis is conducted primarily to determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." In addition to analyses conducted for the RIR, the regulatory flexibility analysis provides: 1) a description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and where feasible, an estimate, of the number of small entities to which the proposed rule applies; 4) a description of impacts of the proposed rule and alternatives; 5) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; and 6) an identification, to the extent practical, of all relevant Federal rules which many duplicate, overlap, or conflict with the proposed rule.

### 5.2.1 Reasons for Considering the Action

This action is needed to reduce the level of harbor porpoise bycatch incurred through commercial fishing operations to levels below the stock's PBR level in order to satisfy NMFS' responsibilities under the MMPA.

### 5.2.2 Objectives and Legal Basis for the Action

The purpose of this action is to implement measures such as gear restrictions, closed areas and seasons, expanded pinger use, and outreach efforts to reduce fishing gear interactions with harbor porpoises. The MMPA requires the implementation of TRPs to reduce the mortality and serious injury of strategic stocks incidentally taken in the course of U.S. commercial fishing operations to below the PBR levels established for such stocks. Because the current average annual human-related mortality and serious injury of harbor porpoises exceeds the stock's PBR level, the stock is considered a strategic stock under the MMPA.

### 5.2.3 Description and Number of Small Entities to Which the Rule Applies

All of the entities (fishing vessels) affected by this action are considered small entities under the Small Business Act size standards for small fishing businesses ($4.0 million in gross sales). According to the 2006 NMFS data sources, there were 975 potentially affected gillnet vessels. This action could affect between 10.3% (101 vessels) and 29.7% (290 vessels) of the fleet under Alt. 4-Pre and Alt. 4-Both, respectively (see Section 4.2.2.3).

### 5.2.4 Reporting, Recordkeeping, and Other Compliance Requirements

This action does not introduce any new reporting, recordkeeping, or other compliance requirements, although it does expand the number of vessels that would require pinger training.

### 5.2.5 Duplication, Overlap, or Conflict with Other Federal Rules

The proposed rule does not duplicate, overlap, or conflict with other Federal rules.

### 5.2.6 Economic Impacts on Small Entities Resulting from the Proposed Action

The proposed management changes encompass a variety of measures that would affect vessels participating in the gillnet fishery. Where possible, a quantitative assessment of the impacts is provided. If a quantitative assessment is not possible, an attempt is made to identify the types and numbers of vessels that may reasonably be expected to be affected.

The following sections contain analyses of the effect of the proposed action on small entities in accordance with Section 603(b) of the Regulatory Flexibility Act. The results presented here are a summary of those presented in Section 4.2 (Economic Impacts of the Alternatives). Alternative 4 (Preferred) consists of four components: Alternative 4 – Pre-trigger (Alt. 4-Pre), Alternative 4 – Coastal Gulf of Maine Consequence Closure Area triggered (Alt. 4-GOM), Alternative 4 – Cape Cod South Expansion and Eastern Cape Cod Consequence Closure Areas triggered (Alt. 4-SNE), and Alternative 4 – all New England consequence closure areas triggered (Alt. 4-Both). Alternative 4 (Preferred) immediately (Alt. 4-Pre) expands pinger requirements in the Northeast by time and area and includes an additional closure to small and large mesh gillnets in the Mudhole South Management Area within the Waters off New Jersey. The other three components set up additional areas to be closed if pinger non-compliance is encountered.

Under Alternative 1 (No Action), the potentially affected gillnet industry revenues were estimated at $40.64M for approximately 975 vessels, based on 2006 data. Under Alt. 4-Pre, despite additional pinger requirements in the Northeast, there was no effect on vessels from GOM ports (Maine to South of Boston), as 82-98% of these vessels should own pingers. Approximately 10.3% (101 vessels) of the total fleet would be affected; however, those vessels are located in ports from East of Cape Cod to New Jersey. Revenues for affected vessels are reduced by <1-6% ($800-$4,700) and 1-7% ($2,600-$7,200) for small (< 40 ft) and large (≥ 40 ft) vessels, respectively. Industry revenues are reduced by less than 1%.

If non-compliance is encountered in the GOM, the Coastal Gulf of Maine Consequence Closure Area (CGOMCCA) may be triggered (Alt. 4-GOM). Approximately 17.5% (171 vessels) of the total fleet are impacted; however, Alt. 4-GOM affects primarily vessels from GOM ports (Maine to North of Boston). This closure has no impact on the South of Boston port since it overlaps spatially and temporally with the Multispecies FMP rolling closures. Revenues for affected vessels are reduced by <1-28% ($160-$26,400) and <1-4% ($160-$7,800) for small and large vessels, respectively. Industry revenues are reduced by 2%.

If non-compliance is encountered in the Southern New England Management Area (SNE), the Cape Cod South Expansion Consequence Closure Area (CCSECCA) and Eastern Cape Cod Consequence Closure Area (ECCCCA) may be triggered (Alt. 4-SNE). Approximately 21.1% (206 vessels) of the total fleet are impacted; however, Alt. 4-SNE has the largest impact on the South of Cape Cod port group since they catch 64% of their port landings in CCSECCA. If the consequence areas are triggered in the SNE, the ECCCCA will also be closed and have some impact on vessels from the East of Cape Cod port group. Affected vessel revenues under Alt. 4-SNE are reduced by 1-10% ($1,300-$8,100) and 1-25% ($1,500-$15,300) for small and large vessels, respectively. Industry revenues are reduced by 3%.

If non-compliance is encountered in both the GOM and SNE, all three consequence areas may be triggered (Alt. 4-Both). Approximately 29.7% (290 vessels) of the total fleet are impacted. Under Alt. 4-Both, revenues for affected vessels are reduced by 2-28% ($2,600-$26,400) and 1-25% ($1,500-$15,300) for small and large vessels, respectively. Industry revenues are reduced by 5%.

In summary, under Alternative 4 (Preferred), the level of impacts on vessels and the location of the vessels affected varied by outcome. The impacts focus on vessels in ports between East of Cape Cod and New Jersey during the pre-consequence closure area trigger phase (Alt. 4-Pre), while the impacts extend up to Maine when the CGOMCCA, ECCCCA and CCSECCA were closed (Alt. 4-Both). Under Alt. 4-Pre, profits of affected vessels are reduced between <1-9% due to the cost of purchasing pingers, profit reductions if vessels choose not to fish in areas that now require pingers, and seasonal closure of the Mudhole South Management Area. Some vessels like those in New Jersey are affected only by the closure while some, such as those in New York, may be affected by both the pinger expansion and closure actions. For vessels from New Jersey and New York, moving from Alt. 4-Pre to any of the closure actions (i.e., Alt. 4-GOM, Alt. 4-SNE, and Alt. 4-Both) results in the percent of affected vessels decreasing or staying the same as these vessels only incur the cost for the pinger expansion during the Alt. 4-

Pre phase. Closure of the CGOMCCA (Alt. 4-GOM) has a greater impact on small vessels, while closure of the CCSECCA (Alt. 4-SNE) tends to have a greater impact on large vessels.

# 6.0 APPLICABLE LAWS AND REGULATIONS

## 6.1 Endangered Species Act

Section 7 of the ESA requires federal agencies to ensure that their actions do not jeopardize the continued existence of any species listed as threatened or endangered or result in the destruction or adverse modification of the Critical Habitat of listed species. The ESA requires the "action" agency to consult with an "expert" agency to evaluate the effects a proposed agency action may have on a listed species. If the action agency determines through preparation of a biological assessment or informal consultation that the Preferred Alternative is "not likely to adversely affect" listed species or Critical Habitat, formal consultation is not required so long as the expert agency concurs.

An informal Section 7 consultation was conducted on the original HPTRP in 1998 and concluded that the HPTRP was not likely to adversely affect any listed species under NMFS jurisdiction (November 12, 1998). Modification of the HPTRP, as identified in the Proposed Action, does not change the basis for this initial determination. Updated information on listed species in the affected environment, discussed in Section 3.2.2, suggests that the Proposed Action may benefit species that overlap in distribution with harbor porpoises, but since significant effort reductions are not likely due to this action, actual effects may be negligible. A consultation on the proposed modifications to the HPTRP was concluded on November 19, 2008. Since this action will not have effects on listed species that were not previously considered during the previous consultation on the initial HPTRP, reinitiation of consultation on this action is not warranted.

## 6.2 Marine Mammal Protection Act

The primary management objective of the MMPA is to maintain the health and stability of the marine ecosystem, with a goal of obtaining an optimum sustainable population of marine mammals within the carrying capacity of the habitat. Section 118 of the MMPA specifies that NMFS develop and implement TRPs to assist in the recovery or prevent the depletion of strategic marine mammal stocks that interact with Category I and Category II fisheries, which are fisheries with frequent (Category I) or occasional (Category II) serious injuries and mortalities of marine mammals. The goal is to reduce these takes incidental to fishing activities to levels below the PBR level, defined as the maximum number of animals, not including natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Alternative 4 (Preferred) will expand gear modifications and closures that reduce the serious injury and mortality of the GOM/BOF stock of harbor porpoises incidental to commercial fishery interactions to levels below PBR, accomplishing the requirements of Section 118 of the MMPA. A discussion of the marine mammals found within the affected environment can be found in Section 3.2.2.1.

## 6.3 Paperwork Reduction Act

This action includes no new collection of information and further analysis is not required. The Proposed Action would require no additional reporting burdens by Northeast and Mid-Atlantic gillnet fishermen.

## 6.4 Magnuson-Stevens Fishery Conservation and Management Act including Essential Fish Habitat

The area affected by the Proposed Action has been identified as EFH for 67 fish species (see Section 3.2.1). These species include American plaice, Atlantic cod, Atlantic halibut, Atlantic herring, Atlantic salmon, Atlantic sea scallop, haddock, monkfish (goose-fish), ocean pout, offshore hake, pollock, red hake, redfish, white hake, whiting (silver hake), windowpane flounder, winter flounder, witch flounder, yellowtail flounder, seven skate species (barndoor, clearnose, little, rosette, smooth, thorny, and winter), deep sea red crab, Atlantic mackerel, black sea bass, bluefish, butterfish, *Illex* squid, *Loligo* squid, ocean quahog, scup, spiny dogfish, summer flounder, surf clam, tilefish, albacore tuna, Atlantic angel shark, Atlantic bigeye tuna, Atlantic bluefin tuna, Atlantic sharpnose, Atlantic skipjack, Atlantic swordfish, Atlantic yellowfin tuna, basking shark, blue marlin, blue shark, dusky shark, longfin mako, porbeagle, sand tiger shark, sandbar shark, scalloped hammerhead, shortfin mako, silky shark, thresher shark, tiger shark, white marlin, and white shark. South Atlantic species include red drum, Spanish mackerel, cobia, king mackerel, and golden crab. In addition to EFH, Habitat Areas of Particular Concern (HAPC) have been identified for two species in the Northeast region, Atlantic cod and Atlantic salmon.

Although few studies have been conducted on the effects of Northeast and Mid-Atlantic gillnets on benthic habitats, EFH and associated benthic species and life stages are not considered to be particularly vulnerable to harm by sink gillnets (Stevenson et al., 2004). None of the proposed measures presented in Section 2 (Summary of Management Alternatives) of this EA are likely to modify fishing practices in a manner that would adversely affect EFH or HAPC. Therefore, an EFH consultation on the Proposed Action is not necessary.

## 6.5 Data Quality Act (Public Law 106-554)

Section 515 of Public Law 106-554 (the Data Quality Act) directs that all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for federal agencies. The following section addresses these requirements.

Utility

The information disseminated is intended to describe a management action and the impacts of that action. The information is intended to be useful to 1) industry participants, conservation groups, State and Federal Managers, and other interested parties so they can understand the management action, its effects, and its justification; and 2) managers and policy makers so they can choose an alternative for implementation.

Along with the proposed and final rules, this EA is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the HPTRT and NMFS to propose this action are the result of a multi-stage process, including the dissemination of this EA. The EA was improved based on comments from the public, the fishing industry, HPTRT members, and NMFS.

This document is available in several formats, including printed publication, and online through the NMFS Northeast Regional Office Web page. The *Federal Register* notice that announces the proposed rule also makes these documents available on the Web site for the Northeast Regional Office and through the www.Regulations.gov Web site. The *Federal Register* document will provide metric conversions for all measurements.

Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in "Security of Automated Information Resources," of OMB Circular A-130, as well as the Computer Security Act and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Information and data, including statistics that may be considered confidential, are used in this EA in the description of the fisheries and analysis of impacts associated with this document. This information is needed to assess the impacts of the alternatives considered as required under the National Environmental Policy Act (NEPA) and Regulatory Flexibility Act for the preparation of an environmental assessment/regulatory flexibility act analysis/regulatory impact review. NMFS complied with all relevant statutory and regulatory requirements as well as NOAA's policy regarding confidentiality of data. In addition, confidential data are safeguarded to prevent improper disclosure or unauthorized use. Finally, the information made available to the public is presented in aggregate, summary, or other such form that does not disclose the identity or business of any person.

Objectivity

The NOAA Information Quality Guidelines standards for Natural Resource Plans state that plans be presented in an accurate, clear, complete, and unbiased manner. The proposed management measures are presented in a clear and easily understandable manner with detailed descriptions that explain the decision making process and the implications of management measures on marine resources and the public. Although the alternatives considered in this document rely

upon scientific information, analyses, and conclusions, clear distinctions are drawn between policy choices and the supporting science. In addition, the scientific information relied upon in the development, drafting, and publication of this EA was properly cited, and a list of references and appendices are provided. Finally, this document was reviewed by a variety of biologists, policy analysts, economists, and attorneys from NMFS' Northeast Region and Northeast Fisheries Science Center (NEFSC).

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Proposed Action were conducted using information from the most recent complete calendar years for which the data are available, through May 31, 2007. Complete and vetted observer and effort data beyond May 2007 were not available at the time during which these analyses were conducted. The data used in the analyses provide the best available information on harbor porpoise bycatch, and Northeast and Mid-Atlantic gillnet landings and value information. Specialists (NEFSC staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to harbor porpoise bycatch and the Northeast and Mid-Atlantic gillnet fisheries.

Preparation of this document required input from the HPTRT, the NEFSC, the Northeast Regional Office (NERO), and NMFS Headquarters. The review process involved the NEFSC, the NERO, and NMFS Headquarters. The NEFSC's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, population biology, and the social sciences. Review by staff at the NMFS Regional and Headquarters Offices is conducted by those with expertise in protected species management and policy, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

## 6.6 Administrative Procedure Act

The Federal Administrative Procedure Act (APA) establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of the APA is to ensure public access to the Federal rulemaking process and to give the public notice and an opportunity to comment before the agency promulgates new regulations. NMFS is not requesting a waiver from the requirements of the APA for notice and comment on this rulemaking.

## 6.7 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 requires that all Federal activities that affect any land or water use or natural resource of the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. NMFS has determined that this action is consistent to the maximum extent practicable with the enforceable policies of approved Coastal Zone Management Programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. Letters documenting NMFS' determination, along with the draft EA and proposed rule (74 FR 36058, July 21, 2009), were sent to the coastal zone

management program offices of these states. The following states submitted responses concurring with NMFS' determination: New Hampshire, Rhode Island, Delaware, and North Carolina. Maine, Massachusetts, Connecticut, New York, New Jersey, Maryland, and Virginia did not respond, therefore, consistency is inferred.

### 6.8 Executive Order (E.O.) 13132 Federalism

E.O. 13132, otherwise known as the Federalism E.O., was signed by President Clinton on August 4, 1999, and published in the *Federal Register* on August 10, 1999 (64 FR 43255). This E.O. is intended to guide Federal agencies in the formulation and implementation of "policies that have federal implications." Such policies include regulations, legislative comments or proposed legislation, and other policy statements or actions that have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. E.O. 13132 requires federal agencies to have a process to ensure meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications. A Federal summary impact statement is also required for rules that have federalism implications.

NMFS believes that these proposed regulations are consistent with E.O. 13132, Federalism. The majority of these regulations were recommended by the HPTRT, which includes agency representatives from fishery resource agencies in each of the states affected by this action, with the exception of Connecticut. In addition, the Assistant Secretary for Legislative and Intergovernmental Affairs is providing notice of the Preferred Alternative to appropriate officials in all the affected coastal states during the public comment period. Any response received will be addressed in the final rule and with a response to the appropriate official.

### 6.9 Regulatory Flexibility Act

The purpose of the Regulatory Flexibility Act (RFA) is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the RFA requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains a Final Regulatory Flexibility Analysis (FRFA), found in Section 5.2, which includes an assessment of the effects that the Proposed Action is expected to have on small entities.

### 6.10 E.O. 12866 Regulatory Planning and Review

The purpose of E.O. 12866, otherwise known as Regulatory Planning and Review, is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget to review regulatory programs that are considered to be "significant." Section 5 of this EA represents the Regulatory Impact Review (RIR), which includes an assessment of the costs and benefits of the Proposed Action, in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy. NMFS guidelines provide criteria to be used to evaluate whether a

Proposed Action is significant under E.O. 12866. A "significant regulatory action" means any regulatory action that is likely to result in a rule that may:

1) Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities.

Response: This action would have neither an annual effect on the economy of $100 million, nor adversely affect in a material way the economy, a sector of the economy, productivity, competition, the environment, public health or safety, or State, local, tribal governments or communities. The gillnet fishery has annual revenues of approximately $40 million in 2006. The proposed action is estimated to have an annual impact between $0.3 and $1.9 million, a reduction of between <1% and 5% of industry revenues.

2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.

Response: The Proposed Action is not expected to be inconsistent or interfere with any action taken or planned by another agency. The purpose of the Proposed Action is to reduce the serious injury and mortality of the GOM/BOF stock of harbor porpoises in Northeast and Mid-Atlantic commercial gillnet fisheries to below the PBR level for this stock, as required by the MMPA. NMFS is the Federal agency responsible for development and implementation of the HPTRP. However, Federal, State, and fishery management agency representatives participated on the HPTRT, helping to ensure the HPTRP is consistent with Federal, State and local laws. Additionally, NMFS forwarded the draft EA to the coastal zone management programs in each coastal state to ensure compliance with State land, water use, and natural resource management programs.

3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

Response: The Proposed Action to implement modifications to the HPTRP is unrelated to any entitlements, grants, user fees, or loan programs, and, therefore, cannot be considered significant under the third criterion of E.O. 12866.

4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Response: The Proposed Action is being taken pursuant to the mandates of the MMPA to reduce the serious injury and mortality of the GOM/BOF stock of harbor porpoises in Northeast and Mid-Atlantic commercial gillnet fisheries to below the stock's PBR level. The proposed modifications to the HPTRP incorporate routine fishery management tools through expanding the existing seasonal gear modifications, expanding closure areas, and establishing triggers that would compel further management actions (closures). Therefore, no novel legal or policy issues are raised, and the Proposed Action would not be considered significant under the fourth criterion specified in E.O. 12866.

Because none of these criteria applies, NMFS has determined that the Proposed Action to modify the HPTRP is not significant for the purpose of E.O. 12866.

## 6.11 National Environmental Policy Act

### 6.11.1 Finding of No Significant Impact for the Proposed Modifications to the HPTRP

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the Proposed Action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

Response: The Proposed Action expands the areas in which closures, pingers, and other gear modifications are required in Northeast and Mid-Atlantic commercial gillnet fisheries. Gillnets are not believed to adversely affect benthic habitats, nor to affect the structures that support copepod and plankton abundance. Gillnets do not cause substantial disturbance of sediments, alteration of water flow, impacts to vegetation, nor other changes to the physical environment. None of the proposed measures are likely to modify current gillnet fishing practices in a manner that would adversely affect habitat. See Section 3.2.1, Essential Fish Habitat, Habitat Areas of Particular Concern, and Critical Habitat, for more information.

2) Can the Proposed Action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: The Proposed Action to modify the HPTRP is not expected to have any impact on biodiversity and/or ecosystem function within the affected areas. The additional seasonal closure and management areas, expanded pinger requirements, and modifications to gillnet gear that are proposed may benefit marine species that overlap in distribution with harbor porpoises. Specifically, Atlantic sturgeon, seals, and large whales may benefit from the proposed February 1 through March 15 large and small mesh gillnet closure of the Mudhole South Management Area offshore of New Jersey (Section 3.2.2, Protected Species); however, since gillnet vessels may shift effort into adjacent waters, the benefits of the closure may be limited or negligible.

Increased gillnet fishing effort, which could impact a number of marine species, is not anticipated to result from the proposed measures. Pinger use has been shown to have little effect on target species or on the proportion of non-target species captured (Kraus et al., 1997a).

Although concerns have been expressed about the possibility that pingers might attract seals to gillnets, the number of seals captured in nets with pingers has not increased over time in management areas in which pingers are required, suggesting that seals are not responding to the pingers as "dinner bells" (see Palka et al. (2008b) in Appendix D and Section 3.2.2.1.3, Pinnipeds). No changes are therefore expected in the effects of gillnet operations on biodiversity, ecosystem functions, or predator/prey relationships.

3) Can the Proposed Action reasonably be expected to have a substantial adverse impact on public health or safety?

Response: Nothing in the Proposed Action can be reasonably expected to have a substantial adverse impact on public health or safety. The Proposed Action does not cause an abbreviated fishing season that would encourage gillnet fishermen to work in unsafe weather conditions. Closures and pinger requirements may encourage vessels to shift effort away from HPTRP management areas and transit farther from home ports (Section 4.2.1.3, Closed Area Model); however, nothing in this action forecloses safer behavior, such as changes in home ports, adoption of gear modification requirements, or changes in gear used during HPTRP management periods. Gillnet fishermen participating on the HPTRT helped develop the proposed measures. Additionally, gillnet fishermen were instrumental in developing and testing pingers prior to implementation of the HPTRP in December 1998. Therefore, the Proposed Action was developed with the gillnet fishermen's understanding of fishing practices and techniques and does not include any unsafe fishing practices.

4) Can the Proposed Action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Response: The purpose of the Proposed Action is to reduce the serious injury and mortality of harbor porpoises incidental to commercial gillnet fisheries in New England and the Mid-Atlantic to levels below the stock's PBR level. Measures to expand management and closure areas and periods are proposed. In response to these measures, gillnet fishermen are expected to purchase and fish with pingers or otherwise modify gear as required in the expanded management areas, and relocate effort when areas are closed to gillnet fishing. No overall reduction in gillnet effort is anticipated. These changes are not expected to adversely affect any endangered or threatened species or critical habitat (Section 3.2, Biological Environment). Although there may be slight benefits to species that overlap with harbor porpoises in distribution, no adverse effects to marine mammals or other non-target species are expected. An ESA section 7 consultation has been initiated and will be completed prior to implementation of a final rule.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: This EA documents no significant social or economic impacts associated with natural or physical effects resulting from implementation of the Proposed Action. The Action is designed to reduce the effects of Northeast and Mid-Atlantic gillnet fisheries on harbor porpoises. The potential social and economic impacts of the Proposed Action are analyzed in Section 4.2 (Economic Impacts of the Alternatives) of this EA as well as in the E.O. 12866

review (Section 5.1). The gillnet fishery had annual revenues of approximately $40 million in 2006. The proposed action is estimated to have an annual impact between $0.3 and $1.9 million, a reduction of between <1% and 5% of industry revenues.

The level of impacts on vessels and the locations of the vessels impacted will depend on whether or not consequence closure areas are triggered by bycatch rates that exceed specified target compliant bycatch rates. While no closures are triggered, the impacts are focused primarily on vessels in ports between East of Cape Cod and New Jersey. If consequence closure areas are triggered, the impacts will extend up to Maine (Section 4.2.2.1, Vessel Impacts).

In summary, prior to consequence closures, profits of affected vessels are reduced between two and 16% due to 1) the cost of purchasing pingers, 2) profit reductions if vessels choose not to fish in areas that now require pingers, and 3) closure in the Mudhole South Management Area (Section 4.2.2.1, Vessel Impacts). Some vessels like those in New Jersey are affected only by the addition of the Mudhole South Management Area, while some vessels, such as those in New York, may be affected by both the pinger expansion in the Southern New England Management Area, as well as closure actions. For vessels from New Jersey and New York, implementation of consequence closure areas results in the percent of affected vessels decreasing or staying the same, as these vessels only incur the cost for the pinger expansion. Closure of the Coastal Gulf of Maine Consequence Closure Area has a greater impact on smaller vessels than larger vessels, while closure of the Cape Cod South Expansion Consequence Closure Area tends to have a greater impact on larger vessels than smaller vessels.

6) Are the effects on the quality of the human environment likely to be highly controversial?

Response: The effects on the quality of the human environment are not likely to be highly controversial. In the highly regulated environment of the Northeast and Mid-Atlantic gillnet fisheries, the imposition of additional regulations contributes to an increasingly difficult work environment for fishermen and the communities they support. However, the Proposed Action was developed in consultation with the HPTRT, which includes Northeast and Mid-Atlantic gillnet fishermen or their representatives, members from an appropriate agency in each affected coastal State, Federal agency representatives, fishery management organizations, as well as participants from conservation and academic groups. Most of the elements within Alternative 4 (Preferred) received consensus or broad support from these team members (Section 2.2.4, Alternative 4: Preferred), who represent a broad spectrum of interested constituents.

7) Can the Proposed Action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Response: The Proposed Action cannot be reasonably expected to result in substantial impacts to unique or ecologically critical areas. Right whale critical habitat, designated HAPCs, EFH for 67 fish species, and the Stellwagen Bank National Marine Sanctuary all occur within the broad management areas of the HPTRP. Although few studies have been conducted on the effects of New England and Mid-Atlantic gillnets on benthic habitats, EFH and associated benthic species and life stages are not considered to be very vulnerable to harm by sink gillnets (Stevenson et al.,

2004). Additionally, the structures that support the copepod and plankton abundance that provide the habitat's value to right whales are not likely to be affected by gillnets (Section 3.2.1, Essential Fish Habitat, Habitat Areas of Particular Concern, and Critical Habitat). Additionally, none of the proposed measures presented in Section 2 of this EA are likely to modify fishing practices in a manner that would adversely affect EFH, HAPC, right whale critical habitat, or Stellwagen Bank National Marine Sanctuary.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The Proposed Action is not expected to result in highly uncertain effects on the human environment or to involve unique or unknown risks. The Proposed Action expands areas and seasons for closures, pinger use, and other gear modifications already implemented under the HPTRP. No unique actions are proposed that may result in unknown risks. While there is a degree of uncertainty over how fishermen will react to the proposed measures, and there is some uncertainty over the total reduction in harbor porpoise takes by serious injury and mortality in gillnets, particularly in waters adjacent to the management areas, the analytical tools used to evaluate the proposed measures attempt to take that uncertainty into account and reflect the results as a range of possible outcomes. The data considered, including observer, effort, and economic data, have been used to evaluate countless previous management actions. Overall, the impacts of the Proposed Action can be, and are, described with a relative amount of certainty.

9) Is the Proposed Action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: The cumulative impacts of past, present, and reasonably foreseeable future actions associated with harbor porpoises and Northeast and Mid-Atlantic gillnet fisheries on the natural or physical environment are evaluated in Section 4.3. These actions were not found to result in significant cumulative impacts when analyzed together with the Proposed Action. The incidental take of harbor porpoises by serious injury and mortality in Northeast and Mid-Atlantic gillnet fisheries is expected to be reduced to below PBR under the Proposed Action. No effects to listed and protected marine species, critical habitat, EFH, HAPC, and the Stellwagen Bank National Marine Sanctuary are anticipated, and takes of some protected species will be reduced by other ongoing actions such as the ALWTRP and the BDTRP. The Proposed Action, when assessed in conjunction with the many other actions listed in Section 4.3, would not have significant impacts on the natural or physical environment.

10) Is the Proposed Action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: The Proposed Action is not likely to affect objects listed in the National Register of Historical Places or cause significant impacts to scientific, cultural, or historical resources. The managed gillnet fisheries are remote and have no effect on most of the listed Historical Places. The steamship "Portland" located within the Stellwagen Bank National Marine Sanctuary is the only object listed on the National Register of Historical Places that occurs within the affected

environment. Although current regulations allow fishing within the Sanctuary, vessels typically avoid fishing near shipwrecks or bottom obstructions in order to avoid tangling and losing expensive fishing gear. None of the elements of the Proposed Action would change fishing practices in any manner that would make gillnet fishermen more likely to set their gear in the vicinity of the "Portland."

11) Can the Proposed Action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: None of the elements of the Proposed Action would result in the introduction or spread of non-indigenous species. The Proposed Action will not result in U.S. vessels leaving regional waters, or result in foreign vessels operating in U.S. waters.

12) Is the Proposed Action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

Response: The Proposed Action essentially expands existing management measures to reduce the incidental take of harbor porpoises by serious injury and mortality in Northeast and Mid-Atlantic gillnet fisheries to below PBR as required by the MMPA. No novel management actions are proposed, nor do the proposed measures represent a decision that compels novel future management actions with significant effects. The Proposed Action expands the New England management areas within which pingers are required, but pingers have been used since 1999 within this area. Area closures, expanded within the Proposed Action, are routinely used for both protected species and fish management actions. The consequence closure areas identified in the Proposed Action implement a trigger mechanism that is new to the HPTRP (Section 2.2.4, Alternative 4: Preferred). However, seasonal and annual catch limits trigger closures in numerous species, and right whale densities have been used to trigger dynamic management under the ALWTRP.

13) Can the Proposed Action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: The Proposed Action is not expected to violate Federal, State, or local environmental laws. Rather, the purpose of the Proposed Action is to bring the Northeast and Mid-Atlantic gillnet fisheries into compliance with MMPA requirements through modification of the HPTRP. The MMPA requires the implementation of measures, through a take reduction plan, to reduce the serious injury and mortality of marine mammals in U.S. commercial fisheries to levels that are below each stock's PBR. After implementation of the HPTRP in 1999, harbor porpoise takes remained below PBR until 2004. The Proposed Action is designed to again reduce the incidental take of harbor porpoises in Northeast and Mid-Atlantic gillnet fisheries to below PBR to allow the fisheries to continue without violating the requirements of the MMPA. Federal, State, and fishery management agency representatives participated on the HPTRT, helping to ensure consistency with Federal, State and local laws. Additionally, NMFS forwarded the draft EA to the coastal zone management programs in each coastal state to ensure compliance with State land, water use, and natural resource management programs. Any comments received

suggesting the proposed changes to the HPTRP may result in violations of environmental laws will be addressed in the final EA and final rule.

14) Can the Proposed Action reasonably be expected to result in cumulative adverse affects that could have a substantial effect on the target species or non-target species?

Response: The Proposed Action can not be reasonably expected to result in cumulative adverse affects that could have a substantial effect on any of the target or non-target species caught in Northeast and Mid-Atlantic gillnet fisheries. No increase in effort and harvest levels would be caused by the Proposed Action. Some measures may actually result in a slight reduction in effort. Shifts in fishing effort into waters adjacent to managed or closed areas are not likely to increase total harvest of target or non-target species. Harvest of target and non-target species is managed under the relevant FMPs or state management plans, rather than through the Proposed Action. Nothing in the Proposed Action would hamper the conservation benefits of these FMPs.

---

**DETERMINATION**

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for the Harbor Porpoise Take Reduction Plan Modifications, it is hereby determined that the Proposed Action will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

9/24/09

Patricia A. Kurkul
Regional Administrator
National Marine Fisheries Service
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

Date

## 7.0 REFERENCES


Atlantic Sturgeon Review Team. 2007. Status Review of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus* ). Report to NMFS NERO, February 23, 2007. 174 pp.

ASMFC, 2007. ASMFC Spiny Dogfish Board Sets 2008/2009 Fishing Year Quota at 8 Million Pounds. Atlantic States Marine Fisheries Commission News Release. October 30, 2007. Accessed from: http://www.asmfc.org/.

Baird, R.W. and P.J. Stacey. 1990. Status of Risso's dolphin, *Grampus griseus*, in Canada. *Can. Field Nat.*105:233-242.

Barco, S.G., W.A. McLellan, J. Allen, R. Asmutis, R. Mallon-Day, E. Meagher, D.A. Pabst, J. Robbins, R. Seton, R.M. Swingle, M.T. Weinrich, and P. Clapham. 2002. Population identity of humpback whales in the waters of the U.S. mid-Atlantic states, *J. Cetacean Res. Manage*. 4:135-141.

Barlas, M.E. 1999. The distribution and abundance of harbor seals (*Phoca vitulina concolor*) and gray seals

Best, P.B., J.L. Bannister, R.L. Brownell, Jr., and G.P. Donovan, (eds.). 2001. Report of the workshop on status and trends of western North Atlantic right whales. *J. Cetacean Res. Manage.* (Special Issue) 2:61-87.

Bisack, K.D. 1997. Harbor porpoise bycatch estimates in the New England multispecies sink gillnet fishery: 1994 and 1995. *Rep. int. Whal. Commn* 47: 705-714.

Brongersma, L. 1972. European Atlantic Turtles. Zool. Verhand. Leiden 121: 318 pp.

CETAP. 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report #AA551-CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp.

Clapham, P.J., L.S. Baraff, C.A. Carlson, and M.A. Christian. 1993. Seasonal Occurrence and Annual Return of Humpback Whales, *Megaptera novaeangliae,* in the Southern Gulf of Maine. *Can. J. Zool.,* 71:440-443.

Clapham, P.J., J. Barlow, T. Cole, D. Mattila, R. Pace, D. Palka, J. Robbins, and R. Seton. 2003. Stock definition, abundance, and demographic parameters of humpback whales from the Gulf of Maine, *J. Cetacean Res. Manage*., 5:13-22.

Clark, C.W. 1995. Application of U.S. Navy underwater hydrophone arrays for scientific research on whales, *Reports of the International Whaling Commission* 45:210-212.

Cole, T.V.N., D.L. Hartley, and R.M. Merrick. 2005. Mortality and serious injury determinations for large whale stocks along the eastern seaboard of the United States, 1999-2003. U. S. Dep Commer., NOAA-National Marine Fisheries Service-NEFSC Ref. Doc. 05-08; 20 p. Available from National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026

Cox, T.M., A.J. Read, D. Swanner, K. Urian, and D. Waples. 2003. Behavioral responses of bottlenose dolphins, *Tursiops truncatus*, to gillnets and acoustic alarms. *Biological Conservation* 115: 203-212.

Curry, B. and J. Smith. 1997. Phylogeographic Structure of the Bottlenose Dolphin (*Tursiops truncatus*): Stock Identification and Implications for Management. Pp. 327-347 In: A. Dizon, S. Chivers, and W. Perrin (ed), Molecular Genetics of Marine Mammals. Spec. Pub. 3 Society for Marine Mammalogy.

Davies, J.L. 1957. The geography of the gray seal. *J. Mamm* 38:297-310.

deHart, P. A. P. 2002. The distribution and abundance of harbor seals (Phoca vitulina concolor) in the Woods Hole region. M.A. Thesis, Boston University, Graduate School of Arts and Sciences. Boston, MA, 88 pp.

Dodd, C.K. 1982. Nesting of the green turtle, *Chelonia mydas* (L.), in Florida: historic review and present trends. *Brimleyana* 7: 39-54.

Duffield, D.A. 1986. Investigation of genetic variability in stocks of the bottlenose dolphin (*Tursiops truncatus*). Final report to the NMFS/SEFSC, Contract No. NA83-G A-00036.

Duffield, D.A., S.H., Ridgway, and L.H. Cornell. 1983. Hematology distinguishes coastal and offshore forms of dolphins (*Tursiops*). *Can. J. Zool.* 61: 930 -933.

Ehrhart, L.M. 1989. Status report of the loggerhead turtle. In Ogren, L., F. Berry, K. Bjorndal, H. Kumpf, R. Mast, G. Medina, H. Reichart, and R. Witham (ed). Proceedings of the 2nd Western Atlantic Turtle Symposium. NOAA Technical Memorandum NMFS-SEFC-226: 122-139.

Epperly, S.P. 2003. Fisheries related mortality and turtle excluder devices (TEDs), p.339-353. In Lutz, P.L., Musick, J.A. and Wyneken, J. (ed). The Biology of Sea Turtles, Vol. II, CRC Press, Boca Raton.

Evans, P.G.H. 1987. The natural history of whales and dolphins. Facts on File Publications, New York, 343 pp.

Evans, W.E. 1994. Common dolphin, white-bellied porpoise. Pp 191-224. In: S. H. Ridgway, and R. Harrison (ed). Handbook of marine mammals, Volume 5: The first book of dolphins. Academic Press, San Diego, CA.

Gaskin, D.E. 1977. Harbour porpoise, *Phocoena phocoena* (L.), in the western approaches to the Bay of Fundy 1969-75. *Rep. int Whal. Comm* 27:487-492.

Gaskin, D.E. 1992. Status of Atlantic white-sided dolphin, *Lagenorhynchus acutus*, in Canada. *Can. Fld. Nat.* 106:64-72.

Gowans, S. and H. Whitehead. 1995. Distribution and habitat partitioning by small odontocetes in the Gully, a submarine canyon on the Scotian Shelf. *Can. J. Zool.* 73:1599-1608.

Hain, J.H.W., G.R. Carter, S.D. Kraus, C.A. Mayo, and H.E. Winn. 1982. Feeding behavior of the humpback whale, *Megaptera novaeangliae*, in the western North Atlantic. *Fish. Bull.* U.S. Fish. Wildl. Serv. 80:259-268.

Hain, J.H.W., M.J. Ratnaswamy, R.D. Kenney, and H.E. Winn. 1992. The fin whale, *Balaenoptera physalus*, in waters of the northeastern United States continental shelf. *Reports of the International Whaling Commission* 42:653-669.

Hamazaki, T. 2002. Spatiotemporal prediction models of cetacean habitats in the mid-western North Atlantic Ocean (from Cape Hatteras, North Carolina, USA to Nova Scotia, Canada). *Mar. Mammal Sci.* 18(4):920-939.

Haycock, C. R. and S.N. Mercer. 1984. Observations and notes on the abundance and distribution of cetaceans in the Eastern Bay of Fundy near Brier Island, Nova Scotia, in August and September 1984. Unpublished report.

Henwood, T.A., and L.H. Ogren. 1987. Distribution and migrations of immature Kemp's ridley turtles (Lepidochelvs kempii) and green turtles (Chelonia mydas) off Florida, Georgia, and South Carolina. *Northeast Gulf Science* g(2): 153-160.

Hersh, S.L. and D.A. Duffield. 1990. Distinction between northwest Atlantic offshore and coastal bottlenose dolphins based on hemoglobin profile and morphometry. Pages 129-139. *In:* S. Leatherwood and R. R. Reeves (ed). *The bottlenose dolphin*. Academic Press, San Diego, 653 pp.

Hildebrand, H. 1963. Hallazgo del area de anidación de la tortuga "lora" *Lepidochelys kempii* (Garman), en la costa occidental del Golfo de México (Rept., Chel.). Ciencia Mex., 22(a):105, 112.

Hoelzel, A.R., A. Nataoli, M.E. Dahlheim, C. Olavarria, R.W. Baird, and N.A. Black. 2002. Low world-wide genetic diversity in the killer whale (*Orcinus orca*): Implications for demographic history. *Proc. R. Soc. Lond.* 269:1467–1473.

Hoover, K., S. Sadove, and P. Forestell. 1999. Trends of harbor seal, *Phoca vitulina*, abundance from aerial surveys in New York waters: 1985-1999. Proceedings of the 13th Biennial Conference on the Biology of Marine Mammals, Wailea, Hawaii, Nov. 28 - Dec. 3, 1999. (Abstract).

ICES. 2006. Report of the Joint ICES/NAFO Working Group on Harp and Hooded Seals. 12-16 June 2006, Copenhagen, Denmark. ICES CM 2006/ACFM:32 28 pp. Available at: http://www.ices.dk/reports/ACFM/2006/WGHARP/WGHARP06.pdf

International Whaling Commission. 1992. Report of the comprehensive assessment special meeting on North Atlantic fin whales. *Reports of the International Whaling Commission* 42:595-644.

Jacobs, S.R. and J.M. Terhune. 2000. Harbor seal (*Phoca vitulina*) numbers along the New Brunswick coast of the Bay of Fundy in autumn in relation to aquaculture. *Northeastern Naturalist* 7(3): 289-296.

Katona, S.K. and J.A. Beard. 1990. Population Size, Migrations, and Feeding Aggregations of the Humpback Whale *(Megaptera novaeangliae)* in the Western North Atlantic Ocean. *Reports of the International Whaling Commission,* Special Issue 12:295- 306.

Katona, S.K., V. Rough, and D.T. Richardson. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution Press, Washington, DC, 316 pp.

Kenney, M.K. 1994. Harbor seal population trends and habitat use in Maine. M.S. Thesis. University of Maine, Orono, ME. 55 pp.

Kenney, R.D. 1990. Bottlenose dolphins off the northeastern United States. Pages 369-386 *in* S. Leatherwood and R. R. Reeves (ed). The bottlenose dolphin, Academic Press, San Diego, 653 pp.

Kenney, R.D., H.E. Winn, and M.C. Macula. 1995. Cetaceans in the Great South channel, 1979-1989: right whale (*Eubalaena glacialis*). *Cont. Shelf Res.* 15: 385-414.

Kenney, R.D., M.A.M. Hyman, R.E. Owen, G.P. Scott, and H.E. Winn. 1986. Estimation of prey densities required by Western North Atlantic right whales, *Mar. Mamm. Sci.* 2(1):1-13.

Knowlton, A.R., M.K. Marx, H.M. Pettis, P.K. Hamilton, and S.D. Kraus. 2005. Analysis of scarring on North Atlantic right whales (*Eubalaena glacialis*): monitoring rates of entanglement interaction 1980-2002. Final Report to the National Marine Fisheries Service, Contract #43EANF030107. Available from: New England Aquarium, Central Wharf, Boston, MA 02110.

Kraus, S.D., A.J. Read, A. Solow, K. Baldwin, T. Spradlin, E. Anderson, and J. Williamson. 1997a. Acoustic alarms reduce porpoise mortality. *Nature* 388:525.

Kraus, S.D., J.H. Prescott, and G.S. Stone. 1983. Harbour porpoise, *Phocoena phocoena*, in the U.S. coastal waters of the Gulf of Maine: A survey to determine seasonal distribution and abundance. Report to the Director, National Marine Fisheries Service, 166 Water St., Woods Hole, MA. 15 pp.

Kraus, S., S. Brault, and K. Baldwin. 1997b. A Springtime Field Test of the Use of Pingers to Reduce Incidental Mortality of Harbor Porpoises in Gill Nets. Draft Final Report.

Leatherwood, S., D.K. Caldwell, and H.E. Winn. 1976. Whales, dolphins, and porpoises of the western North Atlantic: a guide to their identification. U.S. Dept. of Commerce. NOAA Tech. Rep. NMFS Circ. 396, 176 pp.

Lesage, V. and M.O. Hammill. 2001. The status of the grey seal, *Halichoerus grypus*, in the Northwest Atlantic. *Can. Field Nat.* 115(4):653-662.

Lutcavage, M. and J.A. Musick. 1985. Aspects of the biology of sea turtles in Virginia. *Copeia* (2):449-456.

MAFMC. 2008. Framework Adjustment 2 to the Spiny Dogfish Fishery Management Plan. Prepared by the Mid-Atlantic Fishery Management Council and New England Fishery Management Council in cooperation with the National Marine Fisheries Service.

Mansfield, A.W. 1966. The grey seal in eastern Canadian waters. *Can. Audubon Mag*. 28:161-166.

Marquez, R.M. 1990. FAO Species Catalogue. Sea turtles of the world. An annotated and illustrated catalogue of sea turtle species known to date. FAO Fish. Synopsis. 125(11). FAO, Rome. 81 PP

Mayo, C.A. and M.K. Marx. 1990. Surface foraging behaviour of the North Atlantic right whale, *Eubalaena glacialis*, and associated zooplankton characteristics. *Can. J. Zool.* 68:2214-2220.

McConnell, K.E. and I.E. Strand. 1997. Do Scientists' Perceptions Reflect the Public's? Ambio: 124-125.

McLellan, W.A., A.S. Friedlaender, J.G. Mead, C.W. Potter, and D.A. Pabst. 2003. Analysing 25 years of bottlenose dolphin (*Tursiops truncatus*) strandings along the Atlantic coast of the USA: do historic records support the coastal migratory stock hypothesis? *J. Cetacean Res. Manage* 4:297-304.

McLellan, W.A., E. Meagher, L. Torres, G. Lovewell, C. Harper, K. Irish, B. Pike, and A.D. Pabst. 2004. Winter right whale sightings from aerial surveys of the coastal waters of the US Mid-Atlantic. Presented at the 15th Biennial Conference on the Biology of Marine Mammals. Wailea, Hawaii, Nov. 28 - Dec. 3, 1999. (Abstract).

Mead, J.G. and C.W. Potter. 1995. Recognizing two populations of the bottlenose dolphin (*Tursiops truncatus*) off the Atlantic coast of North America: morphologic and ecologic considerations. International Biological Research Institute Reports 5:31-43.

Meylan, A., B. Schroeder, and A. Mosier. 1995. Sea turtle nesting activity in the state of Florida. *Fla. Mar. Res. Publ.* 52:1–51.

Morgan, L.E. and R. Chuenpagdee. 2003. Shifting gears: addressing the collateral impacts of fishing methods in U.S. waters. Pew Science Series on Conservation and the Environment, Washington D.C., Island Press, 42 p.

Murphy, M.A. 1995. Occurrence and group characteristics of minke whales, *Balaenoptera acutorostrata*, in Massachusetts Bay and Cape Cod Bay. *Fishery Bulletin* 93: 577-585.

National Research Council. 1990. Decline of the sea turtles: Causes and prevention. *Natl. Acad. Press*, Washington, D.C., 259 p.

NEFMC. 2006. Framework Adjustment 42 to the Northeast Multispecies Fishery Management Plan and Framework Adjustment 3 to the Monkfish Fishery Management Plan Including an Environmental Assessment, Regulatory Impact Review, Initial Regulatory Flexibility Analysis.

Prepared by the New England Fishery Management Council and Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service.

NEFMC. 2009. Draft Amendment 16 to the Northeast Multispecies Fishery Management Plan Including a Draft Environmental Impact Statement. Prepared by the New England Fishery Management Council in cooperation with the National Marine Fisheries Service.

NEFMC and MAFMC. 2008. Monkfish FMP Framework Adjustment 5 Incorporating Stock Assessment and Fishery Evaluation (SAFE) Report for the 2006 Fishing Year and the Environmental Assessment and Regulatory Impact Review. Prepared by the New England Fishery Management Council and Mid-Atlantic Fishery Management Council in cooperation with the National Marine Fisheries Service.

NEFSC. 2002. Workshop on the effects of fishing gear on marine habitats off the northeastern United States, October 23-25, 2001, Boston, Massachusetts. U.S. Natl. Mar. Fish. Serv., Northeast Fish. Sci. Cent. Woods Hole, Lab. Ref. Doc. 02-01, 86 p.

NEFSC. 2006. Report of the 43rd Northeast Regional Stock Assessment Workshop: Stock Assessment Review Committee Consensus Summary of Assessments. Northeast Fisheries Science Center Ref. Doc. 06-25. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Nelson, M, M. Garron, R. L. Merrick, R. M. Pace III, and T. V. N. Cole. 2007. Mortality and serious injury determinations for baleen whale stocks along the United States eastern seaboard and adjacent Canadian Maritimes, 2001-2005. U.S. Dep. Commer., Northeast Fish. Sci. Cent Ref. Doc. 07-04; 18 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

NMFS. 1991. Recovery Plan for the Humpback Whale ***(Megaptera novaengliae)*** Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries. Silver Spring, Maryland. 105p.

NMFS. 1998. Harbor Porpoise Take Reduction Plan (HPTRP) Final Environmental Assessment and Final Regulatory Flexibility Analysis. NMFS Office of Protected Resources, Silver Spring, MD.

NMFS. 2001. Final Review of the Biological Status of the Gulf of Maine/Bay of Fundy Harbor Porpoise (*Phocoena phocoena*) Pursuant to the Endangered Species Act. National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2005. Recovery Plan for the North Atlantic Right Whale (*Eubalaena glacialis*) Revision. National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2007. Final Environmental Impact Statement for Amending the Atlantic Large Whale Take Reduction Plan; Broad-based Gear Modifications. Prepared by Industrial Economics Inc and National Marine Fisheries Service Northeast Regional Office, Gloucester, MA.

NMFS and USFWS. 1991. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C.

NMFS and USFWS. 2007. Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) 5-Year Review: Summary and Evaluation. Prepared jointly by the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.

NMFS SEFSC. 2001. Stock assessments of loggerhead and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S. Department of Commerce NOAA Technical Memorandum NMFS-SEFSC-455, 343 pp.

Northeast Data Poor Stocks Working Group. 2007. Monkfish assessment summary for 2007. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 07-13; 12 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole MA 02543-1026.

Northridge, S., M. Tasker, A. Webb, K. Camphuysen, and M. Leopold. 1997. White-beaked *Lagenorhynchus albirostris* and Atlantic white-sided dolphin L. *acutus* distributions in northwest European and U.S. North Atlantic waters. *Rep. int. Whal. Commn* 47:797-805.

Office of Management and Budget. 2003. Circular A-4 Regulatory Analysis.

Ogren, L. 1989. Distribution of juvenile and subadult Kemp's ridley turtles: preliminary results from the 1984–1987 surveys. Pages 116–123 in C. W. Caillouet, Jr., and A. M. Landry, Jr. (ed). Proceedings of the First International Symposium on Kemp's Ridley Sea Turtle Biology, Conservation and Management. TAMU-SG-89-105, Sea Grant Program, Texas A&M University, Galveston, Texas.

Orphanides, C.D. and D.L. Palka. 2008. Bycatch of harbor porpoises in three U.S. gillnet management areas: Southern Mid-Atlantic, Offshore, and Western Gulf of Maine. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-09; 8 p. Available from: http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0809/

Palka, D. 1995a. Abundance estimate of the Gulf of Maine harbor porpoise. *Rep. int. Whal. Commn* (Special Issue) 16:27-50.

Palka, D. 1995b. Influences on spatial patterns of Gulf of Maine harbor porpoises. pp. 69-75 In: A.S. Blix, L.Walløe and Ø. Ulltang (ed). Whales, seals, fish and man. Amsterdam, The Netherlands: Elsevier Science; p. 69-75.

Palka, D. 2000. Abundance of the Gulf of Maine/Bay of Fundy harbor porpoise based on shipboard and aerial surveys during 1999. NOAA-NMFS-NEFSC Ref. Doc. 00-07. 29pp.

Palka, D.L. 2008. Predicted harbor porpoise bycatch under potential mitigation measure scenarios. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-13; 4 p.

Palka, D., A. Read, and C. Potter. 1997. Summary of knowledge of white-sided dolphins (*Lagenorhynchus acutus*) from the U.S. and Canadian North Atlantic waters. *Rep. int Whal. Commn.* 47:729-34.

Palka, D.L., C.D. Orphanides, and M.L. Warden. 2008a. Summary of harbor porpoise bycatch,

covariates and levels of compliance in the Northeast and Mid-Atlantic gillnet fisheries after the implementation of the Take Reduction Plan: January 1, 1999 through May 31, 2007. In press.

Palka, D., M. Rossman, A. VanAtten, and C. Orphanides. 2008b. Effect of Pingers on Harbor Porpoise and Seal Bycatch in the US Northeast Gillnet Fishery. Paper SC/60/SM2 presented to the Scientific Committee, June 2008 (unpublished); 27pp. Paper available from the IWC Secretariat: secretariat@iwcoffice.org.

Palka, D.L. and C.D. Orphanides. 2008a. Harbor porpoise bycatch rates that indicate compliance with pinger regulations for the Northeast gillnet fishery. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-10; 13 p.

Palka, D.L. and C.D. Orphanides. 2008b. Predicted bycatch of harbor porpoises under various alternatives to reduce bycatch in the US Northeast and Mid-Atlantic gillnet fisheries. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-14; 31 p.

Payne, P.M. and D.C. Schneider. 1984. Yearly changes in abundance of harbor seals, *Phoca vitulina*, at a winter haul-out site in Massachusetts. *Fish. Bull., U.S.* 82:440-442.

Payne, M. and D.W. Heinemann. 1990. A distributional assessment of cetaceans in the shelf and shelf edge waters of the northeastern United States based on aerial and shipboard surveys, 1978-1988. Report to National Marine Fisheries Science Center, Woods Hole, Massachusetts.

Payne, P.M., L.A., Selzer, and A.R. Knowlton. 1984. Distribution and density of cetaceans, marine turtles, and seabirds in the shelf waters of the northeastern United States, June 1980-December 1983, based on shipboard observations. NOAA/NMFS Contract No. NA-81-FA-C-00023.

Perry, S.L., D.P. DeMaster, and G.K. Silber. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. *Marine Fisheries Review* 61(1):1-74.

Read, A.J. 1994. Interactions between cetaceans and gillnet and trap fisheries in the northwest Atlantic. *Rep. int. Whal. Commn.* (Special Issue) 15:133-147.

Read, A.J. and A.J. Westgate. 1997. Monitoring the movements of harbour porpoises (*Phocoena phocoena*) with satellite telemetry. *Marine Biology* 130:315-22.

Read, A., D. Swanner, D. Waples, E. Burke, L. Williams, and K. Urian. 2006. Will acoustic deterrents reduce depredation by bottlenose dolphins in the Spanish mackerel gillnet fishery? Draft Final Report. North Carolina Fishery Resource Grant Program Project 04-FEG-04.

Richardson, D.T. 1976. Assessment of harbor and gray seal populations in Maine 1974-1975. Final report, contract No. MM4AC009, Marine Mammal Commission., Washington, DC, 46 pp.

Robbins, J. and D.K. Mattila. 2001. Monitoring entanglements of humpback whales (*Megaptera novaeangliae*) in the Gulf of Maine on the basis of caudal peduncle scarring. Paper SC/53/NAH25 presented to the International Whaling Commission Scientific Committee. Available from IWC, 135 Station Road, Impington, Cambridge, UK.

Rosenfeld, M., M. George, and J.M. Terhune. 1988. Evidence of autumnal harbour seal, *Phoca vitulina*, movement from Canada to the United States. *Can. Field-Nat.* 102(3):527-529.

Ross, J.E. and M.A. Barwani. 1982. Review of sea turtles in the Arabian area, p. 3:73-383.In K. Bjorndal (ed.), Biology and conservation of *sea* turtles. Smithsonian Institution Press; Washington, D.C.

Schmid, J.R. and W.N. Witzell. 1997. Age and growth of wild Kemp's ridley turtles (*Lepidochelys kempi*): cumulative results of tagging studies in Florida. C*helonian Conserv. Biol*. 2:532–537.

Schneider, D.C. and P.M. Payne. 1983. Factors affecting haul-out of harbor seals at a site in southeastern Massachusetts. *J. Mamm.* 64(3):518-520.

Schroeder, C.L. 2000. Population status and distribution of the harbor seal in Rhode Island waters. M.S. Thesis, University of Rhode Island, Kingston, RI. 197 pp.

Sears, R., F.W. Wenzel, and J.M. Williamson. 1981. Behavior and distribution observations of Cetacea along the Quebec north shore (Mingan Islands), summer-fall 1981, Unpublished report, Mingan Island Cetacean Study, Montreal, 72 pp.

Selzer, L.A. and P.M. Payne. 1988. The distribution of white-sided (*Lagenorhynchus acutus*) and common dolphins (*Delphinus delphis*) vs. environmental features of the continental shelf of the northeastern United States. *Mar. Mammal. Sci.* 4(2):141-153.

Sergeant, D.E., A.W. Mansfield, and B. Beck. 1970. Inshore records of cetacea for eastern Canada, 1949-68. *J. Fish. Res. Bd. Can.* 27:1903-1915.

Slocum, C.J., R. Schoelkopf, S. Tulevech, M. Stevens, S. Evert, and M. Moyer. 1999. Seal populations wintering in New Jersey (USA) have increased in abundance and diversity. Proceedings of the 13th Biennial Conference on the Biology of Marine Mammals, Wailea, Hawaii, Nov. 28 - Dec. 3, 1999. (Abstract).

Stein, A.B., K.D. Friedland, and M. Sutherland. 2004a. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society* 133: 527-537.

Stein, A.B., K.D. Friedland, and M. Sutherland. 2004b. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. *North American Journal of Fisheries Management* 24: 171-183.

Stevenson, D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, and M. Pentony. 2004. Characterization of the Fishing Practices and Marine Benthic Ecosystems of the Northeast U.S. Shelf, and Evaluation of the Potential Effects of Fishing on Essential Fish Habitat. NOAA Tech Memo NMFS NE 181.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. *Mar. Mamm. Sci. 9: 309-315.*

Temte, J.L., M.A. Bigg, and O. Wiig. 1991. Clines revisited: the timing of pupping in the harbour seal (*Phoca vitulina*). *J. Zool. Lond.* 224: 617-632.

Turtle Expert Working Group. 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the western North Atlantic. U.S. Dep. Commer. NOAA Tech. Memo. NMFS-SEFSC– 409, 96 pp.

Turtle Expert Working Group. 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. U.S. Dep. Commer. NOAA Tech. Mem. NMFS-SEFSC–444, 115 pp.

Ward, N. 1995. Stellwagen Bank: A Guide to the Whales, Sea Birds, and Marine Life of the Stellwagen Bank National Marine Sanctuary, pp. 157-158, Down East Books, Camden, ME.

Waring, G.T., C.P. Fairfield, C.M. Ruhsam, and M. Sano. 1992. Cetaceans associated with the Gulf Stream features off the northeastern USA shelf. ICES Marine Mammals Comm. C.M. 1992/N: 12, 29 pp.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley (ed.). 2006. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2005. NOAA Technical Memorandum NMFS–NE-194; 358 p.

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley (ed). 2007b. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2006. NOAA Tech Memo NMFS-NE-201; 378 p.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley (ed). 2007a. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2007. NOAA Tech Memo NMFS-NE-205; 415 p.

Waring, G.T., E. Josephson, C.P. Fairfield-Walsh, and K. Maze-Foley (ed). 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2008. NOAA Tech Memo NMFS-NE-210; 440 p.

Waring, G.T., J.M. Quintal, and S.L. Swartz. 2000. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2000. NOAA Technical Memorandum NMFS–NE-162; 298 p.

Waring, G.T., R.M. Pace, J.M. Quintal, C.P. Fairfield, and K. Maze-Foley (ed). 2004. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2003. NOAA Tech Memo NMFS-NE-182; 287 p.

Wells, R.S., H.L. Rhinehart, P. Cunningham, J. Whaley, M. Baran, C. Koberna and D.P. Costa. 1999. Long distance offshore movements of bottlenose dolphins. *Mar. Mammal Sci.*15(4):1098-1114.

Westgate, A.J., A.J. Read, T.M. Cox, T.D. Schofield, B.R. Whitaker, and K.E. Anderson. 1998. Monitoring a rehabilitated harbor porpoise using satellite telemetry. *Mar. Mammal Sci.* 14(3):599-604.

Whitman, A.A. and P.M. Payne. 1990. Age of harbour seals, *Phoca vitulina concolor*, wintering in southern New England. *Can. Field Nat.* 104(4):579-582.

Wiley, D.N., R.A. Asmutis, T.D. Pitchford, and D.P. Gannon. 1995. Stranding and mortality of humpback whales, *Megaptera novaeangliae*, in the mid-Atlantic and southeast United States, 1985-1992. *Fish. Bull*. 93: 196-205.

Wilson, S.C. 1978. Social organization and behavior of harbor seals, *Phoca concolor*, in Maine. Final Report contract MM6ACO13, GPO-PB-280-188, Marine Mammal Commission, Washington, DC, 36 pp.

Wynne, K. and M. Schwartz. 1999. Guide to marine mammals and turtles of the U.S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant. Narragansett, RI. 115 pp.

## 8.0 LIST OF ACRONYMS

| | |
|---|---|
| **ALWTRP** | Atlantic Large Whale Take Reduction Plan |
| **APA** | Administrative Procedure Act |
| **ASMFC** | Atlantic States Marine Fisheries Commission |
| **BDTRP** | Bottlenose Dolphin Take Reduction Plan |
| **CAM** | Closed Area Model |
| **CCSECCA** | Cape Cod South Expansion Consequence Closure Area |
| **CCSMA** | Cape Cod South Management Area |
| **CEQ** | Council on Environmental Quality |
| **CETAP** | Cetacean and Turtle Assessment Program |
| **CF** | NEFSC Commercial Fisheries Database |
| **CFR** | Code of Federal Regulations |
| **CGOMCCA** | Coastal Gulf of Maine Consequence Closure Area |
| **COLREGS** | Demarcation Line for the International Regulations for Preventing Collisions at Sea, 1972 |
| **CPUE** | Catch per Unit Effort |
| **CZMA** | Coastal Zone Management Act |
| **DAS** | Days at Sea |
| **DPS** | Distinct Population Segment |
| **DPWG** | Northeast Data Poor Stocks Working Group |
| **EA** | Environmental Assessment |
| **ECC** | East of Cape Cod |
| **ECCCCA** | Eastern Cape Cod Consequence Closure Area |
| **EEZ** | Exclusive Economic Zone |
| **EFH** | Essential Fish Habitat |
| **EO** | Executive Order |
| **ESA** | Endangered Species Act of 1973 |
| **FMP** | Fishery Management Plan |
| **FR** | Federal Register |
| **GAMS** | General Algebraic Modeling System |
| **GB** | Georges Bank |
| **GOM** | Gulf of Maine |
| **GOM/BOF** | Gulf of Maine/Bay of Fundy |
| **GOMTRT** | Gulf of Maine Harbor Porpoise Take Reduction Team |
| **HAPC** | Habitat Areas of Particular Concern |
| **HPTRP** | Harbor Porpoise Take Reduction Plan |
| **HPTRT** | Harbor Porpoise Take Reduction Team |
| **ICES** | International Council for the Exploration of the Sea |
| **IRFA** | Initial Regulatory Flexibility Analysis |
| **MA** | Mid-Atlantic |
| **MAFMC** | Mid-Atlantic Fishery Management Council |
| **MATRT** | Mid-Atlantic Harbor Porpoise Take Reduction Team |
| **MMPA** | Marine Mammal Protection Act of 1972 |
| **MSFCMA** | Magnuson-Stevens Fishery Conservation and Management Act |
| **MSMA** | Mudhole South Management Area |
| **NB** | North of Boston |
| **NCDMF** | North Carolina Division of Marine Fisheries |
| **NEFMC** | New England Fishery Management Council |

| | |
|---|---|
| **NEFSC** | Northeast Fisheries Science Center |
| **NEPA** | National Environmental Policy Act of 1969 |
| **NERO** | Northeast Regional Office (NMFS) |
| **NFMA** | Northern Fishery Management Area |
| **NMFS** | National Marine Fisheries Service |
| **NNB** | Net National Benefit |
| **NOAA** | National Oceanic and Atmospheric Administration |
| **OBS** | NEFSC Observer Database |
| **OMA** | Offshore Management Area |
| **PBR** | Potential Biological Removal |
| **PVC** | Present Value of Cost |
| **RFA** | Regulatory Flexibility Act |
| **RIR** | Regulatory Impact Review |
| **SAR** | Stock Assessment Report |
| **SB** | South of Boston |
| **SCC** | South of Cape Cod |
| **SEFSC** | Southeast Fisheries Science Center |
| **SFMA** | Southern Fishery Management Area |
| **SMA** | Southern Mid-Atlantic Management Area |
| **SNE** | Southern New England Management Area |
| **SSNE** | South of Southern New England |
| **TAC** | Total Allowable Catch |
| **TED** | Turtle Excluder Device |
| **TRP** | Take Reduction Plan |
| **TRT** | Take Reduction Team |
| **USCG** | United States Coast Guard |
| **VMRC** | Virginia Marine Resources Commission |
| **VMS** | Vessel Monitoring System |
| **VTR** | Vessel Tracking and Reporting Database |
| **WONJ** | Waters off New Jersey Management Area |
| **WTP** | Willingness-to-Pay |
| **ZMRG** | Zero Mortality Rate Goal |

## 9.0 LIST OF PREPARERS AND CONTRIBUTORS

For inquiries about the EA or to request a copy of the document, please contact the NMFS, Northeast Region, Protected Resources Division, at (978) 281-9328.

### PREPARERS (PREPARED EA)

Michael J. Asaro
Biologist
NMFS, Northeast Region, Protected Resources Division

Kathryn Bisack
Protected Species Economist
NMFS, Northeast Fisheries Science Center

Colleen Coogan
Consultant
Oak Management Inc.

David Gouveia
Marine Mammal Coordinator
NMFS, Northeast Region, Protected Resources Division

Amanda Johnson
Fishery Biologist
NMFS, Northeast Region, Protected Resources Division

Gisele Magnusson
Protected Species Economist
NMFS, Northeast Fisheries Science Center

Christopher Orphanides
Research Fishery Biologist
NMFS, Northeast Fisheries Science Center

Debra Palka
Research Fishery Biologist
NMFS, Northeast Fisheries Science Center

Amy VanAtten
Fishery Biologist
NMFS, Northeast Fisheries Science Center

### CONTRIBUTORS (CONSULTED ON EA)

Melissa Andersen
Fishery Biologist
NMFS Headquarters, Office of Protected Resources

Jennifer Anderson
NEPA Specialist
NMFS, Northeast Region, NEPA Office

Diane Borggaard
Marine Mammal Policy Analyst
NMFS, Northeast Region, Protected Resources Division

Stacey Carlson
BDTRP Coordinator
NMFS, Southeast Region, Protected Resources Division

Lou Chiarella
Essential Fish Habitat Coordinator
NMFS, Northeast Region, Habitat Conservation Division

Douglas Christel
Policy Analyst
NMFS, Northeast Region, Sustainable Fisheries Division

Mary Colligan
Assistant Regional Administrator
NMFS, Northeast Region, Protected Resources Division

Kevin Collins
Attorney Advisor
NOAA Office of General Counsel, Northeast Region

Kim Damon-Randall
Proactive Conservation Program Coordinator
NMFS, Northeast Region, Protected Resources Division

Allison Ferreira
Policy Analyst
NMFS, Northeast Region, Sustainable Fisheries Division

John Higgins
Gear Research and Outreach, Northern Coordinator
NMFS, Northeast Region, Protected Resources Division

Ellen Keane
Sea Turtle Biologist
NMFS, Northeast Region, Protected Resources Division

Lynn Lankshear
Section 7 Biologist
NMFS, Northeast Region, Protected Resources Division

David Stevenson
Marine Habitat Resource Specialist
NMFS, Northeast Region, Habitat Conservation Division

Thomas Warren
Policy Analyst
NMFS, Northeast Region, Sustainable Fisheries Division

## 10.0 LIST OF AGENCIES AND PERSONS CONSULTED

**Harbor Porpoise Take Reduction Team**

**Gillnet Fishing Industry Representatives**

Erik Anderson
New Hampshire Commercial Fishermen's Association

William McCann
Wareham, MA

Ernie Bowden Jr.
Eastern Shore Watermen's Association

Rick Marks
Monkfish Defense Fund

Peter Inniss
Falmouth, ME

Stephen Welch
Hanover, MA

Bill Van Druten
Frisco, NC

Greg DiDomenico
Garden State Seafood Association

Bill Mackintosh
Little Compton, RI

Arthur Sawyer
Gloucester, MA

Earl (Sonny) Gwin
Berlin, MD

Leonard Voss
Smyrna, DE

**Federal Management Organizations**

Melissa Andersen
NMFS Headquarters, Office of Protected Resources

David Gouveia
NMFS, Northeast Region, Protected Resources Division

David Laist
Marine Mammal Commission

David N. Wiley
Stellwagen Bank National Marine Sanctuary

**State Management Organizations**

Erin Burke
Massachusetts Division of Marine Fisheries

Hugh Carberry
New Jersey Division of Fish & Wildlife

Steve Early
Maryland Department of Natural Resources, Fisheries Service

Michael Greco
Delaware Division of Fish & Wildlife

Vacant
New Hampshire Fish and Game Department

Alicia Middleton
Virginia Marine Resources Commission

Vacant
New York State Department of Environmental Conservation (Marine Resources)

Fentress (Red) Munden
North Carolina Division of Marine Fisheries

Terry Stockwell
Maine Department of Marine Resources

April Valliere
Rhode Island Division of Fish and Wildlife

**Conservation/Environmental Organizations**

Regina Asmutis-Silvia
Whale and Dolphin Conservation Society

Vicki Cornish
The Ocean Conservancy

Sharon Young
The Humane Society of the U.S.

**Fishery Management Organizations**

Patricia Fiorelli
New England Fishery Management Council

Melissa Paine
Atlantic States Marine Fisheries Commission

Rich Seagraves
Mid-Atlantic Fishery Management Council

**Academic/ Scientific Organizations**

Sue Barco
Virginia Aquarium and Marine Science Center

William McLellan
Center for Marine Science Research, University of North Carolina at Wilmington

Andrew Read
Duke University Marine Lab, Duke University

**Gear Research**

Joseph DeAlteris
Professor of Fisheries and Aquaculture, University of Rhode Island

Scott Kraus
Edgerton Research Laboratory, New England Aquarium

Ron Smolowitz
Coonamessett Farm, MA

## 11.0 APPENDICES

Appendix A

Palka, D.L., C.D. Orphanides, and M.L. Warden. 2008a. Summary of harbor porpoise bycatch, covariates and levels of compliance in the Northeast and Mid-Atlantic gillnet fisheries after the implementation of the Take Reduction Plan: January 1, 1999 through May 31, 2007. In press.

Appendix B

CONCUR, Inc. January 7, 2008. Key Outcomes Memorandum for the Harbor Porpoise Take Reduction Team Meeting December 17-19, 2007, Philadelphia, Pennsylvania. Available from the HPTRP Web site at: http://www.nero.noaa.gov/prot_res/porptrp/MeetingsKeyOutcomes.html.

Appendix C

Palka, D. L. 2008. Predicted harbor porpoise bycatch under potential mitigation measure scenarios. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-13; 4 p. Available from: http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0813/.

Appendix D

Palka, D., M. Rossman, A. VanAtten, and C. Orphanides. 2008b. Effect of Pingers on Harbor Porpoise and Seal Bycatch in the US Northeast Gillnet Fishery. Paper SC/60/SM2 presented to the Scientific Committee, June 2008 (unpublished); 27pp. Paper available from the IWC Secretariat: secretariat@iwcoffice.org.

Appendix E

NMFS. November 2007. Discussion Paper on Planned Amendments to the Harbor Porpoise Take Reduction Plan. Available from the HPTRP Web site at: http://www.nero.noaa.gov/prot_res/porptrp/followup.html.

Appendix F

CONCUR, Inc. March 20, 2008. Key Outcomes Memorandum for the Harbor Porpoise Take Reduction Team January 31, 2008 Teleconference. Available from the HPTRP Web site at: http://www.nero.noaa.gov/prot_res/porptrp/MeetingsKeyOutcomes.html.

Appendix G

Palka, D. L. and C. D. Orphanides. 2008a. Harbor porpoise bycatch rates that indicate compliance with pinger regulations for the Northeast gillnet fishery. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-10; 13 p. Available from: http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0810/.

Appendix H

Orphanides, C. D. and D. L. Palka. 2008. Bycatch of harbor porpoises in three U.S. gillnet management areas: Southern Mid-Atlantic, Offshore, and Western Gulf of Maine. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-09; 8 p. Available from: http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0809/.

Appendix I

Palka, D.L. and C.D. Orphanides. 2008b. Predicted bycatch of harbor porpoises under various alternatives to reduce bycatch in the US Northeast and Mid-Atlantic gillnet fisheries. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-14; 31 p. Available from: http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0814/.