Northeast Fisheries Science Center Reference Document 12-22

Update on Harbor Porpoise Take Reduction Plan Monitoring Initiatives: Compliance and Consequential Bycatch Rates from June 2009 through May 2010

by Christopher D. Orphanides

Northeast Fisheries Science Center Reference Document 12-22

Update on Harbor Porpoise Take Reduction Plan Monitoring Initiatives: Compliance and Consequential Bycatch Rates from June 2009 through May 2010

by Christopher D. Orphanides

National Oceanic Atmospheric Administration, National Marine Fisheries Service,
Northeast Fisheries Science Center, 28 Tarzwell Dr., Narragansett RI 02882 USA

US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, MA

October 2012

Northeast Fisheries Science Center Reference Documents

This series is a secondary scientific series designed to assure the long-term documentation and to enable the timely transmission of research results by Center and/or non-Center researchers, where such results bear upon the research mission of the Center (see the outside back cover for the mission statement). These documents receive internal scientific review, and most receive copy editing. The National Marine Fisheries Service does not endorse any proprietary material, process, or product mentioned in these documents.

All documents issued in this series since April 2001, and several documents issued prior to that date, have been copublished in both paper and electronic versions. To access the electronic version of a document in this series, go to *http://www.nefsc.noaa.gov/nefsc/publications/*. The electronic version is available in PDF format to permit printing of a paper copy directly from the Internet. If you do not have Internet access, or if a desired document is one of the pre-April 2001 documents available only in the paper version, you can obtain a paper copy by contacting the senior Center author of the desired document. Refer to the title page of the document for the senior Center author's name and mailing address. If there is no Center author, or if there is corporate (*i.e.*, non-individualized) authorship, then contact the Center's Woods Hole Laboratory Library (166 Water St., Woods Hole, MA 02543-1026).

Editorial Treatment: To distribute this report quickly, it has not undergone the normal technical and copy editing by the Northeast Fisheries Science Center's (NEFSC's) Editorial Office as have most other issues in the NOAA Technical Memorandum NMFS-NE series. Other than the four covers and first two preliminary pages, all writing and editing have been performed by the authors listed within.

Information Quality Act Compliance: In accordance with section 515 of Public Law 106-554, the Northeast Fisheries Science Center completed both technical and policy reviews for this report. These predissemination reviews are on file at the NEFSC Editorial Office.

This document may be cited as:

Orphanides CD. 2012. Update on harbor porpoise take reduction plan monitoring initiatives: compliance and consequential bycatch rates from June 2009 through May 2010. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-22; 21 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/nefsc/publications/

TABLE OF CONTENTS

Abstract iii
Introduction 1
Methods and Data 2
  Bycatch and Compliance 2
Results 3
  1998 HPTRP Compliance 3
  Bycatch Rates 5
Discussion 6
References Cited 9

ABSTRACT

Harbor Porpoise Take Reduction Plan (HPTRP) compliance and bycatch rate analyses are updated for US Northwestern Atlantic gillnet fisheries using data from June 2009 through May 2010 (the 2009-2010 fishing season). The observed overall compliance rate with the HPTRP regulations was 46.3%. By region, the New England gillnet fishery had a compliance rate of 43.0%, while the Mid-Atlantic gillnet fishery had a compliance rate of 55.4%. Compliance with pinger regulations was determined solely by the number of pingers observed on a gillnet string; pinger functionality was not considered in the compliance rates because pinger functionality data for the 2009-2010 fishing season was limited to six trips. Bycatch rates from the 2009-2010 fishing season were compared to the regulations of the 1998 and 2010 HPTRP final rules, even though some of the 2010 HPTRP amendments were not implemented until March 22, 2010, and most were implemented after the completion of the 2009-2010 fishing season. All but two of the observed takes in the 2009-2010 fishing season occurred in times and areas that were either managed under the 1998 HPTRP regulations, or managed under the 2010 HPTRP amendments. Bycatch rates in the 2010 HPTRP areas associated with Consequence Closure Areas (CCAs) were well above the target rates that could trigger seasonal closures after the 2011-2012 fishing season. The bycatch rate in the 1998 and 2010 HPTRP Management Areas in nets that did not have the required number of pingers (0.058 harbor porpoise/mton landed) was higher than the bycatch rate from nets with the required number of pingers in the same times and areas (0.049 harbor porpoise/mton landed). However, the relative difference between these two rates has been greater in previous years. Pingers still appeared to reduce bycatch of harbor porpoises, although it was not possible to determine how many of the pingers deployed were actually functional and what the true bycatch rate was when a full set of working pingers was used.

INTRODUCTION

Since the beginning of the Northeast Fisheries Observer Program (NEFOP) in 1989, harbor porpoise bycatch in gillnets has been the focus of much attention. Over the years, two Harbor Porpoise Take Reduction Plan (HPTRP) final rules have been put in place to reduce the serious injury and mortality of the Gulf of Maine/Bay of Fundy stock of harbor porpoises (*Phocoena phocoena*). The first HPTRP final rule was announced on Dec 2, 1998 (63 FR 66464) and implemented on January 1, 1999. From here on, these HPTRP regulations will be referred to as the 1998 HPTRP. Shortly after the 1998 HPTRP was implemented, a sharp decline in harbor porpoise bycatch occurred.

Since the implementation of the 1998 HPTRP, a meeting of the Harbor Porpoise Take Reduction Team (HPTRT) was convened in December 2007 in response to recent harbor porpoise bycatch estimates that were above the stock's Potential Biological Removal[1] (PBR) level. The aim of this HPTRT meeting was to develop management actions that would reduce harbor porpoise bycatch in New England and Mid-Atlantic gillnet fisheries to levels below the stock's PBR and approaching the Zero Mortality Rate Goal (ZMRG), which is defined as 10% of PBR. To meet these goals, the meeting focused on addressing non-compliance with the HTPRP as well as harbor porpoise bycatch occurring outside of the 1998 HPTRP Management Areas (MAs).

In January 2008, the HPTRT discussions continued to address modifications to the 1998 HPTRP during a follow-up conference call. Based on the recommendations received from the HPTRT, NMFS published a proposed rule (74 FR 36058) on July 21, 2009 to amend the 1998 HPTRP. The modifications included an expansion of current HPTRP MAs, new management measures, implementation of a "consequence" closure area strategy in New England, and increased enforcement, monitoring, and outreach efforts.

On February 19, 2010 NMFS published a final rule (75 FR 7383) amending the 1998 HPTRP, which was virtually unchanged from the proposed rule. From here on, these HPTRP amendments will be referred to as the 2010 HPTRP. The 2010 HPTRP includes the same requirements and MAs as the 1998 HPTRP, with the following additions: 1) slight expansion in the size of the Massachusetts Bay MA as well as the pinger regulated season to include the month of November; 2) creation of the Stellwagen Bank MA (requiring pingers from November through May) and the Southern New England MA (requiring pingers from December through May); 3) implementation of the "consequence" closure area strategy; 4) creation of the Mudhole South MA in the Mid-Atlantic; 5) modification to the tie-down spacing requirement on large mesh gillnets in the Mid-Atlantic; and 6) slight modification to the northern boundary of the Waters off New Jersey.

On March 17, 2010 NMFS delayed the effective date for implementing new pinger requirements in the Stellwagen Bank and Southern New England MA from March 22, 2010 to September 15, 2010 (75 FR 12699). This was due to concerns expressed by members of the gillnet fishing industry regarding the lack of availability of pingers and the short time required to

[1] PBR is defined as the maximum number of animals that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. For the specifics on the harbor porpoise PBR, see the harbor porpoise stock assessment chapter in the most recent report on the US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments (Waring et al. 2011) (http://www.nefsc.noaa.gov/publications/tm/tm219/)

complete mandatory pinger authorization training. However, all other new 2010 HPTRP requirements became effective March 22, 2010.

One of the key new components of the 2010 HPTRP to address non-compliance is the Consequence Closure Area (CCA) strategy. Under this strategy, if the average bycatch rate from two consecutive management seasons in areas associated with a CCA exceeds a specified target bycatch rate, a seasonal closure of that CCA would be triggered. The CCA strategy involves three potential seasonal closure areas; these areas overlap with existing MAs. The Coastal Gulf of Maine CCA overlaps with the Mid-Coast, Stellwagen Bank, and Massachusetts Bay MAs. The Eastern Cape Cod and Cape Cod South Expansion CCAs overlap with the Southern New England MA (Figure 1C). A plan to monitor the effectiveness of and compliance with the HPTRP was developed along with an improved enforcement strategy (NOAA Fisheries PRD 2010). Compliance with the HPTRP requirements is critical to maximizing the effectiveness of the HPTRP, and the development of the monitoring plan and enforcement strategy were intended to contribute significantly toward achieving the goals and objectives of the HPTRP. For more information on the 1998 and 2010 HPTRP regulations, view the NOAA Fisheries Service Northeast Regional Office's HPTRP website at: http://www.nero.noaa.gov/hptrp.

This paper reports the observed compliance rates with the 1998 and 2010 HPTRP requirements, and the observed bycatch rates for the HPTRP MAs using data collected during June 2009 through May 2010 (referred to as the 2009-2010 fishing season). However, it should be emphasized that the 2010-2011 fishing season was the first of two consecutive fishing seasons used to evaluate bycatch rates within potential CCAs. The fishing season evaluated in this paper (2009-2010) was not used to evaluate a potential CCA. It is assumed that the 2009-2010 fishing season bycatch rates may not be an accurate indication of bycatch rates after the full implementation of the 2010 HPTRP amendments.

This paper can be considered an update to the series of papers that reviewed bycatch rates and HPTRP compliance for the past two fishing seasons (2007-2008 and 2008-2009, Orphanides et al. 2009 and Orphanides 2010, respectively). The Orphanides et al. (2009) paper also discussed pinger tester development, while the present paper will update this and report on the deployment of pinger testers during the 2009-2010 season.

METHODS AND DATA

Bycatch and Compliance

The NEFOP data were used to calculate bycatch and compliance rates. Bycatch rates were calculated as the number of observed harbor porpoise takes per observed metric tons (mtons) of live fish landed. Recorded dressed landed weights were converted to live weights using established conversion factors (Warden and Orphanides 2008). Metric tons of fish landed were used to calculate bycatch rates to be consistent with how annual harbor porpoise bycatch estimates are calculated (e.g., Orphanides 2010), and because 2010 HPTRP CCAs are tied to bycatch rates using this unit of effort. Landings are used to calculate annual harbor porpoise bycatch estimates because landings are the only unit of effort that are both statistically appropriate and available in the databases used to estimate the bycatch for the total fishery (Orphanides and Palka 2007).

Rare missing values in the NEFOP database were imputed using medians from representative strata using methods described in Warden and Orphanides (2008). After imputing missing values from representative strata, 3.5% (125 out of 3525) of the observed hauls still had

missing values in the variables used in the bycatch and compliance analysis. Two hauls with incidental harbor porpoise takes were missing twine size information. One haul was in the Waters off New Jersey where twine size is regulated, though the other haul was in the Gulf of Maine where twine size is not regulated under the HPTRP. Mesh size was recorded on all observed hauls. For 99.2% (3496 out of 3525) of the hauls, mesh size was recorded as a single value, for 0.8% of the hauls (28 of 3525), it was recorded as minimum and maximum values, and one value was imputed from other mesh sizes on the trip. When a minimum and maximum range was recorded, a simple average of these two mesh sizes was used in this analysis. Twine size was imputed on 5.8% of the observed hauls (203 out of 3525), which accounted for most of the imputed values used in this analysis. Out of 707 hauls observed using tie-downs, ten hauls (1.4% of those using tie-downs) were observed as having used tie-downs without recording the length of the tie-downs, and one of these hauls had an incidental take of harbor porpoise. However, none of these occurred within HPTRP MAs and so do not impact compliance calculations. Latitude and longitude was imputed for 17 (0.5%) out of 3525 hauls, and was missing for 36 (1.0%) hauls. These missing locations were left unknown and therefore were not included when compliance and bycatch information was summarized by area. The number of pingers on a haul was not recorded for 1.0% of hauls with known pinger use (6 out of 588). For these hauls, the number of pingers also could not be determined from examination of the NEFOP gear logs and observer comments. However, none of these six hauls had observed harbor porpoise bycatch.

Recorded gear configurations were used to check for HPTRP compliance. The gear requirements that were checked within the time/areas defined within the HPTRP included: pinger use, net length, twine size, number of nets per string, tie-down length, and tie-down use. Additionally, compliance with seasonal HPTRP closures to gillnet fishing was examined. In the Mid-Atlantic for large mesh and small mesh gillnets, the regulations for the tie-down spacing and number of nets per vessel were not investigated because this information was not recorded on observer logs.

Pinger functionality was assessed for the six trips where pinger testers were employed. For these six trips, the total percentage of functional pingers was quantified, as was the true compliance (where pingers were both functional and present in the proper number). However, since limited pinger functionality data was available for this time period, pinger functionality data were not included in the compliance calculations.

In the New England gillnet fisheries during times and areas where pingers are required, a typical gillnet string with 10 300-ft long nets is required to have 11 working pingers on the string (one pinger on each end of the string, and one in between each net). The presence of the proper number of pingers was assessed. In addition, pinger use in less than the required numbers was also assessed to examine attempted compliance and to provide a complete investigation of pinger use in the fishery. However, it is thought that only the use of the proper number of functional pingers will achieve bycatch reduction goals (Palka et al. 2008). It is also important to note that the pinger compliance for this analysis did not assess whether pingers were functioning properly, but simply whether the required number of pingers was present on nets.

RESULTS

1998 HPTRP Compliance

The overall observed compliance rate to the HPTRP for the period June 2009 – May 2010 was 46.3% (Table 1). The total observed compliance rate for New England was 43.0%,

with the highest New England compliance rate within the Cape Cod South MA (85.2%), and lowest rate within the Offshore MA (21.3%). No hauls were observed in the Northeast Closure Area or in the Cashes Ledge Closure Area when they were closed to gillnets. The Mid-Atlantic had similarly poor compliance rates, with an overall rate of 55.4%. The highest Mid-Atlantic compliance rate was within the small mesh hauls in the Waters off New Jersey MA (87.5%), and the lowest rate among areas with more than one haul observed was within the large mesh hauls in the Southern Mid-Atlantic MA (29.0%). For a description of the 1998 HPTRP regulations see Table 2 and Figures 1A and 1B.

In the New England sink gillnet fishery, all non-compliant hauls were out of compliance because they did not have the required number of pingers. No fishing was observed in areas closed to all gillnet fishing (Table 3). Among the pingered hauls in the 1998 HPTRP New England MAs, 21.5% (98 out of 455) contained greater than or equal to 90%, but less than 100% of the required number of pingers (Table 4). It is important to note that the pinger compliance for this analysis did not assess whether pingers were functioning properly, but simply whether the required number of pingers was present on the nets.

Outside of the 1998 HPTRP New England MAs that required pingers, 7.6% (84 out of 1099) of the observed New England hauls used pingers in a fashion that would be compliant, if they were within a MA requiring pingers (Table 4). Roughly two thirds of these New England pingered hauls outside of 1998 HPTRP MAs occurred within the 2010 HPTRP Stellwagen Bank and Southern New England MAs (35.7%, 30 out of 84, and 33.3%, 28 out of 84, respectively).

Pinger testers were present on 7 trips during the study period, 4 in December 2009, 2 in January 2010 (Table 5), and 1 in March 2010. These trips comprised 22 hauls, though 7 hauls had no pingers on the nets and were not included in this summary, including all 4 hauls on the March 2010 trip. Of the observed pinger tester hauls with pingers on the nets, 9 were in the Mid-Coast MA, 3 in the Massachusetts Bay MA, and 3 in the 2010 Stellwagen Bank MA. No harbor porpoise were incidentally caught on any of the trips where pinger testers were present. Seventy-nine percent of pingers tested were working. On roughly half of the tested hauls (8 of 15), all pingers that were present were working, though they may not have had the proper number of pingers. Among the tested hauls, 6 had the proper number of pingers present, but only 1 of these had all pingers working. A third of these (2 of 6) were in the 2010 Stellwagen Bank MA, where pingers were not yet required. On a third of the tested hauls (5 of 15) it was reported that at least one pinger was lost. This loss rate is much higher than that reported on observed hauls with pingers that did not have the pinger testers. Only 6 of 573 (1.0%) New England hauls deployed with pingers, but without pinger testers, reported a pinger lost.

Only half of the observed hauls (6/12) with incidental harbor porpoise takes within 1998 HPTRP MAs were compliant with the 1998 HPTRP regulations (Table 6). Among the 6 non-compliant hauls in the New England 1998 HPTRP MAs, 5 Mid-Coast MA hauls used pingers, but not enough to be compliant. In addition, 10 hauls with a total of 11 takes occurred in the area that would become the Southern New England 2010 HPTRP MA, which was not in place at the time of the takes. These incidental takes occurred in two primary areas; 6 occurred in the southern portion of the area that would become the Southern New England MA, and 5 occurred on 4 hauls east of Cape Cod (Figure 2).

In the Mid-Atlantic 1998 HPTRP MAs, 8 harbor porpoises were taken on 4 hauls, three of which were compliant with closed area and gear modification requirements (no pingers are required in the Mid-Atlantic) (Table 6). The non-compliant haul was non-compliant due to exceeding the maximum required tie down length. This haul also took place in a time and area

that would be closed under the 2010 HPTRP (Mudhole South MA); however, the final rule amending the HPTRP became effective on March 22, 2010, which was after the seasonal closure of this area would have taken place (February 1 through March 15). Therefore, the area was not closed at the time the take occurred. All Mid-Atlantic hauls with takes occurred in the Waters off New Jersey MA in hauls with large mesh.

In the Mid-Atlantic, 19.7% (17 out of 86) of all non-compliant hauls occurred in a closed area (Tables 1 and 3). The majority of non-compliant hauls (89.5%, 77 out of 86) occurred on large mesh strings. More than a third (37.2%, or 32 out of 86) of non-compliant Mid-Atlantic hauls exceeded the limit on the number of nets per haul. Among non-compliant hauls, only a handful (3.5%, 3 out of 86) had multiple violations, such as having too many nets on a string and not fishing with tie-downs on the same string (Table 2).

Bycatch Rates

The observed harbor porpoise bycatch rate in the Mid-Coast MA (0.091 harbor porpoise/mton landed) was the highest of any MA in New England (Table 7). The bycatch rate in the neighboring 1998 HPTRP version of the Massachusetts Bay MA (prior to its slight expansion in the 2010 HPTRP) (0.088 harbor porpoise/mton landed) was just slightly lower than in the Mid-Coast. The bycatch rate within the Cape Cod South MA was 0.032 harbor porpoise/mton landed. The 2010 HPTRP expanded that area to the Southern New England MA (see Figure 1), and the bycatch rate within that larger area was higher at 0.075 harbor porpoise/mton landed because the bycatch rate within the additional area was high (0.085 harbor porpoise/mton landed). The difference between these two regions is likely real, but could be due in part to a more than three times larger sample size in the Southern New England area outside of the Cape Cod South MA. On the opposite end of the spectrum, the Offshore MA and the 2010 HPTRP Stellwagen Bank MA both had more than 160 hauls observed and each had an observed bycatch rate of zero. Also non-HPTRP areas had a low bycatch rate of 0.007 harbor porpoise/mton landed.

Bycatch rates in the Mid-Atlantic varied considerably by area. An extremely high bycatch rate of 0.500 harbor porpoise/mton landed was observed in the Waters off New Jersey MA (Table 7). This excludes the Mudhole North MA, but includes the area of the Mudhole South MA. The Mudhole South MA was part of the Waters off New Jersey MA during this time, prior to the creation of the Mudhole South MA as a separate area with more stringent requirements. But, no matter how the area is divided up, the end result is a very high bycatch rate in the region off New Jersey (0.418 harbor porpoise/mton landed in Waters off New Jersey, Mudhole South, and Mudhole North MAs combined). No takes were observed in the Southern Mid-Atlantic.

Bycatch rates in areas associated with 2010 HPTRP CCAs were well above the 2010 HPTRP target bycatch rates. The combined bycatch rate for the areas associated with the Coastal Gulf of Maine CCA was 0.060 harbor porpoise/mton landed, or nearly twice the HPTRP 2010 target rate for that area (0.031 harbor porpoise/mton landed) (Table 7). The bycatch rate for the area associated with the Eastern Cape Cod and Cape Cod South Expansion CCAs was 0.075 harbor porpoise/mton landed, or more than three times the 2010 HPTRP target bycatch rate for that area (0.023 harbor porpoise/mton landed). However, it should be emphasized that the 2010 HPTRP CCA management measures were not in place during the fishing season evaluated in this paper, June 2009 – May 2010. Monitoring of the areas associated with the Consequence Closure Areas began on September 15, 2010.

Among the 29 harbor porpoises observed incidentally taken during the 2009-2010 management seasons, only 2 (6.9%) were taken outside of the 1998 or 2010 HPTRP management times and areas. More than a third of the observed incidental takes (11 out of 29 harbor porpoises) were observed in areas that were not historically regulated under the 1998 HPTRP, but would be included in the 2010 HPTRP amendments. The remainder (16 harbor porpoises, 62.1%) occurred within the 1998 HPTRP MAs (Figure 2 and Tables 6 and 7). One of these 16 animals was observed in waters that would be closed under the 2010 HPTRP as part of the Mudhole South MA, but was open at the time as a part of the Waters off New Jersey MA. Among observed hauls in New England, the additional 2010 HPTRP MAs had a higher bycatch rate (0.065 harbor porpoise/mton landed) than the 1998 HPTRP MAs (0.047 harbor porpoises/mton landed) and non-HPTRP times and areas (0.007 harbor porpoises/mton landed) (Table 7).

Bycatch rates with compliant pinger use varied by MA, where compliance is defined solely in terms of using the correct number of pingers because the functionality of the pingers is unknown (Table 8). Overall, the bycatch rate in the 1998 or 2010 HPTRP MAs was only about 16% less on compliant pingered hauls (0.049 harbor porpoise/mton landed) than on non-compliant hauls (0.058 harbor porpoises/mton landed) that had less than the required number of pingers for the same times and areas. It should also be noted that the more than two-thirds of observed hauls had fewer than the required number of pingers. The bycatch rate for compliant Mid-Coast MA hauls was far less than for non-compliant Mid-Coast MA hauls. However, the bycatch rates were higher in the Cape Cod South and Massachusetts Bay MAs in non-compliant hauls as compared to compliant hauls, though in each case only one take was observed in the compliant MA hauls (Table 8).

DISCUSSION

Compliance levels for the 2009-2010 fishing season were similar to those of the previous fishing season (2008-2009) in the Mid-Atlantic, and worse in New England. In the Mid-Atlantic, this season's compliance (55.4%) was about the same as in the previous management season (56.3%), though it was still poor. Compliance in New England this season (43.0%) was quite a bit lower than during the 2008-2009 fishing season (51.9%) (Orphanides 2010b). This fishing season's compliance in large mesh in the Southern Mid-Atlantic and Offshore MAs was particularly low (29.0% and 21.3%, respectively) (Table 1), though no harbor porpoise incidental takes were observed in either MA. In contrast, the small mesh Southern Mid-Atlantic MA and the Cape Cod South MA both had compliance rates over 80% (Table 1). These compliance levels were associated with no observed bycatch in the Southern Mid-Atlantic MA, and one bycatch event in the Cape Cod South MA. As in past years, no hauls were observed in New England closed areas, while several were observed in Mid-Atlantic closed areas (Table 3) (Orphanides et al. 2009, Orphanides 2010b).

New England pinger compliance rates presented in this paper are likely to be an over-estimate of the actual compliance rates if the limited sample of pinger tester data is representative of the fishery. For the vast majority of observed hauls, it was not known whether the pingers present were functional. However, of the 15 hauls for which pingers were tested, only one haul (6.7%) had the proper number of pingers on the nets and all of the pingers working. Looking more broadly, just over half, or 8 of 15, of the hauls tested had all present pingers on each string functioning, however, 7 of 8 did not have the proper number of pingers on their nets. Admittedly, this is a small sample of tested hauls, but if the results are representative of actual

pinger functionality, then the actual compliance rate estimate would be half or less than the estimates presented here in Table 1, and thus would be at or below the 20 percent range.

Very high bycatch rates (0.500 harbor porpoise/mton) and limited compliance (59.7%) in the Waters off New Jersey continue to be a problem, though observed effort during the MA time period is limited (Table 7). A high bycatch rate in the 2010 HPTRP Southern New England MA shows the importance of this MA in limiting future bycatch. The bycatch rate in Southern New England (not including Cape Cod South MA) during the 2009-2010 season (0.085 harbor porpoise/mton) was less than during the 2008-2009 season (0.117 harbor porpoise/mton), though it was still among the highest rates observed in New England. In contrast, no incidental takes were observed in the 2010 HPTRP Stellwagen Bank MA in the 2009-2010 season, whereas bycatch rates in this area had very high bycatch rates in the previous two management seasons (0.320 harbor porpoise/mton in 2008-2009 and 0.302 harbor porpoise/mton in 2007-2008) (Orphanides et. al. 2009, Orphanides 2010). On the other hand, the Massachusetts Bay MA, right next to Stellwagen Bank MA, had one of the highest MA bycatch rates in New England for the 2009-2010 season.

Despite the lack of observed bycatch in the Stellwagen Bank MA, bycatch patterns for the 2009-2010 fishing season looked fairly similar to those from the previous fishing seasons (Orphanides et al. 2009, Orphanides 2010b). As in the past, the majority of the bycatch occurred in either 1998 or 2010 HPTRP MAs, with very little bycatch occurring outside of 1998 and 2010 MAs. Clusters of bycatch occurred in the Hudson Canyon region (in the general area of the Mudhole North, Mudhole South, and Waters off New Jersey MAs), south of the Cape Cod South MA but within the 2010 HPTRP Southern New England MA, and in the Gulf of Maine in the region of Massachusetts Bay, and southern Mid-Coast MA (Figure 2). Another similarity to previous management seasons was that the bycatch rates in the CCA-associated areas were over twice the target rate needed to avoid closures in the future. However, it should be noted that the 2010 HPTRP management measures, including some new pinger requirements, were not yet in place for the 2009-2010 season.

A change from previous management seasons was the contrast between bycatch rates on hauls with the full complement of pingers versus those with fewer than the required number of pingers. In the previous two seasons, the bycatch rates on hauls with the proper number of pingers were on average roughly 50-70% less than those on hauls without the required number of pingers (Orphanides et al. 2009, Orphanides 2010b). This corresponds with the differences in bycatch rates Palka et al. (2008) found in earlier years between hauls with the required number of pingers and non-pingered hauls. During the 2009-2010 fishing season, the bycatch rate on hauls with a full complement of pingers was still lower than non-pinger compliant hauls, though the difference was not as great (0.049 versus 0.058 harbor porpoise/mton landed). As with all bycatch rates, annual variability is expected. So, this outcome could simply reflect that variability.

Pinger functionality, or lack thereof, could be playing a role in these bycatch rates. For most hauls, it was not known whether pingers present were functional. Using data collected in previous years, it appears that bycatch rates increase on nets with some pingers, but not the proper number (Palka et al. 2008). So, the relatively high bycatch rates on hauls with a full complement of pingers could be explained if a high enough portion of these nets contained pingers that were not working. Alternatively, the difference in compliant and non-compliant bycatch rates could be influenced by unequal sample sizes of hauls with and without pingers in many MAs. Overall, the number of hauls with a full complement of pingers was less than half

the number of hauls without a full complement of pingers. However, in the Mid-Coast MA the sample size was relatively large, and the number of hauls with a full complement of pingers was fairly similar to the number of hauls without the required number of pingers. In this region with similar sample sizes, the bycatch rate was far lower on pinger-compliant hauls as compared to that on pinger non-compliant hauls (0.033 versus 0.142 harbor porpoise/mton landed).

Reducing bycatch in the US Northwest Atlantic gillnet fisheries is largely dependent on compliance with HPTRP regulations. Pingers need to be both present in the proper numbers, and functioning properly to be an effective deterrent to harbor porpoise bycatch (Palka et al. 2008). Pinger functionality is beginning to be assessed by NEFOP, but the sample size for the 2009-2010 fishing season was not large enough to get an accurate picture of how many pingers are functioning and to what extent present but non-functioning pingers are affecting the bycatch rates of strings with a full complement of pingers.

REFERENCES CITED

NOAA Fisheries, Protected Species Division (PRD). 2010. Harbor Porpoise Take Reduction Plan Monitoring Strategy: Monitoring the Effectiveness and Regulatory Compliance of the Harbor Porpoise Take Reduction Plan (HPTRP). p18. Available from: http://www.nero.noaa.gov/prot_res/

Orphanides CD, Palka DL. MS 2007. Landings: the Unit of Effort for Bycatch Rates in Gillnet Fishing Gear. Harbor Porpoise Take Reduction Team (HPTRP) Meeting Materials. Binder Document 3d. Available from National Marine Fisheries Service, Northeast Regional Office, 55 Great Republic Drive, Gloucester, Massachusetts, 01930-2298.

Orphanides CD. 2010. Estimates of Cetacean and Pinniped Bycatch in the 2007 and 2008 Northeast Sink Gillnet and Mid-Atlantic Gillnet Fisheries. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 10-10; 45 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026 or http://www.nefsc.noaa.gov/publications/crd/

Orphanides CD. 2010b. Update on Harbor Porpoise Take Reduction Plan Monitoring Initiatives: Compliance and Consequential Bycatch Rates from June 2008 through May 2009. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 10-22; 23 p.Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications/crd/

Orphanides CD, Wetmore S, Johnson A. 2009. Update on Harbor Porpoise Take Reduction Plan Monitoring Initiatives: Compliance and Consequential Bycatch Rates from June 2007 through May 2008, Pinger Tester Development and Enforcement from January 2008 through July of 2009. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-14; 16 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026 or http://www.nefsc.noaa.gov/publications/crd/

Palka DL, Rossman, MC, VanAtten, AS, and CD Orphanides. 2008. Effect of pingers on harbour porpoise bycatch in the US northeast gillnet fishery. J. Cetacean Res. Manage. 10(3):217-226.

Warden ML, Orphanides CD. 2008. Preparation of the Northeast Fisheries Observer Program gillnet data for use in bycatch analyses of protected species. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-17; 44 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026 or http://www.nefsc.noaa.gov/publications/crd/

Waring GT, Josephson E, Maze-Foley K, Rosel, PE, editors. 2011. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2010. NOAA Tech Memo NMFS NE 219; 598 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications/tm/

Table 1. Observed compliance during June 2009 – May 2010 to the 1998 Harbor Porpoise Take Reduction Plan (HPTRP), by time period and Management Area (MA). Percent compliance was calculated using only those hauls for which compliance was known (i.e., hauls with unknown compliance were removed from the count of total hauls for the calculation). See footnotes and Table 3 for additional non-compliance details.

Time Period	Management Area	Total Observed Hauls in Compliance	Total Observed Hauls in Non-Compliance	Hauls with Unknown Compliance	Total Observed Hauls	Percent Compliant Hauls
Dec 1 - May 31	Cape Cod South	52	9	0	61	85.2
Dec 1 - May 31	MassBay	29	39	0	68	42.6
Sep 15 - May 31	MidCoast	110	120	6[§]	236	47.8
Dec 1 - May 31	Offshore	36	133	0	169	21.3
	New England Total	*227*	*301*	*6*	*534*	43.0
Jan 1 - Apr 30	Mudhole North Large Mesh	7	4	0	11	63.6
Jan 1 - Apr 30	Mudhole North Small Mesh	-	-	-	0	NA
Mar 22* - Apr 30	Mudhole South Large Mesh	0	1	0	1	0.0
Feb 1 - Apr 30	Southern Mid-Atlantic Large Mesh	18	44	0	62	29.0
Feb 1 - Apr 30	Southern Mid-Atlantic Small Mesh	39	8	0[‡]	47	83.0
Jan 1 - Apr 30	Waters off New Jersey Large Mesh	36	28	5[+]	69	56.3
Jan 1 - Apr 30	Waters off New Jersey Small Mesh	7	1	0	8	87.5
	Mid-Atlantic Total	*107*	*86*	*5*	*198*	55.4
	All Areas Total	*334*	*387*	*11*	*732*	46.3

[§] Pinger use could not be evaluated for 6 Mid-Coast Management Area hauls because the number of pingers was not recorded.

* 2010 HPTRP Mudhole South MA was implemented March 22, 2010

[‡] Three Southern Mid-Atlantic Small Mesh hauls had unknown compliance in one gear modification requirement, however, these hauls were also non-compliant in other gear requirements and so are counted in the non-compliant column.

[+] In addition to the 5 Waters off New Jersey Large Mesh hauls with unknown compliance presented here, 4 other hauls had unknown compliance with regards to some gear modification requirement. However, these 4 were also non-compliant for other gear modifications, and thus were included in the non-compliant count.

Table 2. 1998 Harbor Porpoise Take Reduction Plan (HPTRP) management measures for large and small mesh nets in the Mid-Atlantic gillnet fishery that were in effect during June 2009 – May 2010. Note, a net tagging program for both large and small mesh nets was specified in the 1998 HPTRP, but was repealed in the 2010 HPTRP.

LARGE MESH GILLNETS (7 inches to 18 inches)	
Floatline length:	
NJ Mudhole	<= 3,900 ft
NJ waters (excluding the Mudhole)	<= 4,800 ft
Southern Mid-Atlantic waters	<= 3,900 ft
Twine Size	>= 0.90 mm
Tie Downs	Required; spaced not more than 15 ft apart along floatline; not more than 48 inches in length
Net Number per Vessel	<= 80 nets
Net Size	<= 300 ft
Number of Nets within a Net String	
NJ Mudhole	<= 13 nets
NJ waters (excluding the Mudhole)	<= 16 nets
Southern Mid-Atlantic waters	<= 13 nets
Time/Area Closures:	
NJ waters (including the Mudhole)	Closed from Apr 1 – 20
NJ Mudhole	Closed from Feb 15 – Mar 15, April 1 -20
Southern Mid-Atlantic waters	Closed from Feb 15 – Mar 15
Gear Modification Requirements:	
NJ waters (excluding the Mudhole)	Jan 1 – Mar 30 and Apr 21 – 30
NJ Mudhole	Jan 1 – Feb 14; Mar 16 – Mar 31; and Apr 21 – 30
Southern Mid-Atlantic waters	Feb 1 – Feb 14 and Mar 16 – Apr 30
SMALL MESH GILLNETS (> 5 inches to < 7 inches)	
Floatline length:	
NJ waters (including the Mudhole)	<= 3,000 ft
Southern Mid-Atlantic waters	<= 2,118 ft
Twine Size	>= 0.81 mm
Tie Downs	Prohibited
Net Number per Vessel	<= 45 nets
Net Size	<= 300 ft
Number of Nets within a Net String	
NJ Waters (including the Mudhole)	<= 10 nets
Southern Mid-Atlantic waters	<= 7 nets
Time/Area Closures:	
NJ Mudhole	Closed from Feb 15 - Mar 15
Gear Modification Requirements:	
NJ waters (excluding Mudhole)	Jan 1 – Apr 30
NJ Mudhole	Jan 1 – Feb 14 and Mar 16 – Apr 30
Southern Mid-Atlantic waters	Feb 1 – Apr 30

Table 3. Observed compliance with the 1998 Harbor Porpoise Take Reduction Plan (HPTRP) regulations categorized by compliance infraction. NA indicates violation category is not applicable to the row's specific time and management area. For additional details on HPTRPs, see Table 2 or the NOAA Fisheries Service Northeast Regional Office's HPTRP website at: http://www.nero.noaa.gov/prot_res/porptrp/

				General Violation Categories		Specific Violation Categories						
Time Period	1998 HPTRP Management Area	Total Observed Hauls	Total Observed Hauls in Non-Compliance / Unknown Compliance	Gear Modification	Closed Area	Multiple Violations Per Haul	Pingers	Number of Nets	Twine Size	Tie-Down Lengths	Tie-Down Use	Net Length
Dec 1 - May 31	Cape Cod South	61	9	9	0	0	9	NA	NA	NA	NA	NA
Dec 1 - May 31	Massachusetts Bay	68	39	39	0	0	39	NA	NA	NA	NA	NA
Sep 15 - May 31	Mid-Coast*	236	126/6	120	0	0	120	NA	NA	NA	NA	NA
Dec 1 - May 31	Offshore	169	133	133	0	0	133	NA	NA	NA	NA	NA
Jan 1 - Apr 30	Mudhole North Large Mesh	11	4	4	0	0	NA	4	0	0	0	0
Jan 1 - Apr 30	Mudhole North Small Mesh	0	-	-	-	-	NA	-	-	-	-	-
Mar 22‡- Apr 30	Mudhole South Large Mesh	1	1	1	0	0	0	1	0	0	0	0
Feb 1 - Apr 30	Southern Mid-Atlantic Large Mesh	62	44	27	17	3	NA	2	14	0	12	2
Feb 1 - Apr 30	Southern Mid-Atlantic Small Mesh†	47	8/3	8	0	0	NA	5	3	0	0	0
Jan 1 - Apr 30	Waters off New Jersey Large Mesh#	69	28/9	28	0	0	NA	20	0	8	0	0
Jan 1 - Apr 30	Waters off New Jersey Small Mesh	8	1	3	0	0	NA	0	0	0	1	0

* Pinger use could not be evaluated for 6 Mid-Coast Management Area hauls because the number of pingers was not recorded.

‡ 2010 HPTRP Mudhole South MA was implemented March 22, 2010. During the 2009-2010 HPTRP fishing year this area was within the Waters off New Jersey MA. In later years this MA would span from Jan1 through Apr 30

† Three observed Southern Mid-Atlantic Small Mesh hauls had unknown number of nets but were also non-compliant with another gear modification requirement

Nine Waters off New Jersey Large Mesh hauls had unknown twine size, though 4 of these hauls were also non-compilant with another gear requirement.

Table 4. New England pinger use percentages by 1998 and 2010 Harbor Porpoise Take Reduction Plan (HPTRP) Management Areas (MAs). Percentages shown are the percentage of all hauls observed within the time/area specified for that particular row. The term 100% pinger usage (full compliance) means the string has the required number of pingers as defined by the HPTRP, that is, there is one pinger on each end of the string, and one in between each net. Pinger use in the 2010 HPTRP MAs and non-HPTRP areas is summarized in these areas during the 2009-2010 fishing season. No pingers were required in the Mid-Atlantic so this region was not assessed for pinger use.

		Hauls							
Location	Time Period	Total Observed	No Pingers	Some Pingers	Unknown Pinger Use	Pingers Used but an Unknown Quantity	> 0% and < 90% Pinger Use	90% to < 100% Pinger Use (Near Compliance)	100% Pinger Use (Full Compliance)
1998 HPTRP MAs									
Cape Cod South	Dec 1 - May 31	61	9 (15%)	52 (85%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	52 (85%)
Massachusetts Bay	Dec 1 - May 31	68	36 (53%)	32 (47%)	0 (0%)	0 (0%)	2 (3%)	1 (1%)	29 (43%)
Mid-Coast	Sep 15 - May 31	236	15 (6%)	220 (93%)	1 (<1%)	6 (3%)	64 (27%)	41 (17%)	109 (46%)
Offshore	Dec 1 - May 31	169	18 (11%)	151 (89%)	0 (0%)	0 (0%)	59 (35%)	56 (33%)	36 (21%)
Subtotal (1998 HPTRP MAs)		534	78 (15%)	455 (85%)	1 (<1%)	6 (1%)	125 (23%)	98 (18%)	226 (42%)
Additional 2010 HPTRP MAs									
Massachusetts Bay (Additional)	Nov 1 - May 31	6	2 (33%)	4 (67%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (67%)
Southern New England	Dec 1 - May 31	208	170 (82%)	38 (18%)	0 (0%)	0 (0%)	5 (2%)	5 (2%)	28 (13%)
Stellwagen Bank	Nov 1 - May 31	162	125 (77%)	37 (23%)	0 (0%)	0 (0%)	7 (4%)	0 (0%)	30 (19%)
Subtotal (Additional 2010 HPTRP MAs)		376	297 (79%)	79 (21%)	0 (0%)	0 (0%)	12 (3%)	5 (1%)	62 (16%)
Non-HPTRP Areas									
Other	June 1 - May 31	723	668 (92%)	54 (7%)	1 (< 1%)	0 (0%)	15 (2%)	17 (2%)	22 (3%)

Table 5. Results of pinger testing by haul. Note: the Stellwagen Bank Management Area was not in effect at the times of these hauls.

Management Area	Trip	Year	Month	Number of Pingers Hauled	Number of Pingers Working	Pingers Recorded as Lost	Number of Pingers Required	Percentage of Tested Pingers That Were Working	Percent of Required Pingers Present	Required Pingers Present and Working
Mid-Coast	1	2009	Dec	6	6	5	12	100%	50%	No
Mid-Coast	1	2009	Dec	3	3	0	4	100%	75%	No
Mid-Coast	1	2009	Dec	9	9	0	10	100%	90%	No
Mid-Coast	2	2009	Dec	6	6	4	12	100%	50%	No
Mid-Coast	2	2009	Dec	1	1	0	7	100%	14%	No
Stellwagen Bank	3	2009	Dec	8	5	1	8	63%	100%	No
Stellwagen Bank	3	2009	Dec	9	4	0	9	44%	100%	No
Stellwagen Bank	3	2009	Dec	3	1	0	4	33%	75%	No
Mid-Coast	4	2009	Dec	16	13	0	15	81%	107%	No
Mid-Coast	4	2009	Dec	12	5	1	13	42%	92%	No
Mid-Coast	4	2009	Dec	3	1	0	3	33%	100%	No
Mid-Coast	4	2009	Dec	12	10	0	12	83%	100%	No
Massachusetts Bay	5	2010	Jan	7	7	2	11	100%	64%	No
Massachusetts Bay	5	2010	Jan	8	8	0	8	100%	100%	Yes
Massachusetts Bay	6	2010	Jan	10	10	0	11	100%	91%	No
Totals				113	89	13	139	79%	81%	

Table 6. The number of harbor porpoises bycaught during June 2009 – May 2010 by year, month, and Management Area (MA). Also included are details of HPTRP compliance and pinger use on hauls with takes, including: whether a full complement of pingers was used (independent of pinger functionality), compliance with all HPTRP closed area and gear modification regulations (again, pinger functionality was not assessed), and what type of violation was documented, if any.

Year	Month	1998 HPTRP Management Area	1998 and 2010 HPTRP Management Areas (and Management Measures)	Harbor Porpoises	Full Pinger Usage	Compliance (not including functionality) with 1998 HPTRP Regulations	HPTRP Violation Type
2009	Aug			1	No	NA	None
2009	Sep	Mid-Coast	Mid-Coast (Pingers)	1	No	Non-Compliant	Not Enough Pingers*
2009	Oct	Mid-Coast	Mid-Coast (Pingers)	1	No	Non-Compliant	Not Enough Pingers*
2009	Nov	Mid-Coast	Mid-Coast (Pingers)	1	No	Non-Compliant	Not Enough Pingers*
2009	Nov	Mid-Coast	Mid-Coast (Pingers)	1	No	Non-Compliant	Not Enough Pingers*
2009	Nov	Mid-Coast	Mid-Coast (Pingers)	1	No	Non-Compliant	Not Enough Pingers*
2009	Nov			1	No	NA	None
2009	Dec	Massachusetts Bay	Massachusetts Bay (Pingers)	1	Yes	Compliant	None
2010	Jan	Cape Cod South	Cape Cod South (Pingers)	1	Yes	Compliant	None
2010	Jan		Southern New England (Pingers)	1	No	NA	None
2010	Jan		Southern New England (Pingers)	1	No	NA	None
2010	Jan		Southern New England (Pingers)	1	No	NA	None
2010	Feb		Southern New England (Pingers)	1	Yes	NA	None
2010	Mar	Waters off New Jersey Large Mesh	Mudhole South (Closed)	1	No	Non-Compliant	Tie Down Length**
2010	Mar		Southern New England (Pingers)	1	No	NA	None
2010	Mar		Southern New England (Pingers)	1	Yes	NA	None
2010	Mar		Southern New England (Pingers)	1	No	NA	None
2010	Mar	Waters off New Jersey Large Mesh	Waters off New Jersey Large Mesh (Gear Modifications)	2	No	Compliant	None
2010	Mar	Waters off New Jersey Large Mesh	Waters off New Jersey Large Mesh (Gear Modifications)	4	No	Compliant	None
2010	Mar	Waters off New Jersey Large Mesh	Waters off New Jersey Large Mesh (Gear Modifications)	1	No	Compliant	None
2010	Apr	Mid-Coast	Mid-Coast (Pingers)	1	Yes	Compliant	None
2010	Apr		Southern New England (Pingers)	1	No	NA	None
2010	May		Southern New England (Pingers)	2	No	NA	None
2010	May		Southern New England (Pingers)	1	No	NA	None

* Non-compliant Mid-Coast hauls had pinger percentages of 75, 82, 55, 78, and 82 % (where 100% would be compliant).
** Twine size was unrecorded so it was not possible to determine compliance with twine size regulations.

Table 7. Harbor porpoise bycatch rates (number of observed harbor porpoises per observed mtons of landings) in 1998 and 2010 Harbor Porpoise Take Reduction Plan (HPTRP) Management Areas (MAs) and areas associated with 2010 HPTRP Consequence Closure Areas (CCAs), and the compliance rates for the 1998 HPTRP MAs. Compliance as applied to this table is defined as the percent of observed hauls in compliance with all of the applicable regulations, except for pinger functionality in New England and net tagging in the Mid-Atlantic.

Region	New England Management Areas	Observed Number of Hauls	Observed Landings (mtons)	Observed Number of Bycaught Harbor Porpoises	1998 HPTRP Compliance Rate (percent hauls)	Bycatch Rate (harbor porpoises per mtons)
New England	*1998 HPTRP MAs*					
	Cape Cod South	61	30.871	1	85.3%	0.032
	Massachusetts Bay	68	11.391	1	42.7%	0.088
	Mid-Coast	236	65.823	6	46.6%	0.091
	Offshore	169	63.717	0	21.3%	0.000
	Subtotal (1998 HPTRP MAs)	534	171.802	8	42.5%	0.047
	Additional 2010 HPTRP MAs					
	Southern New England (not including Cape Cod South)	208	129.985	11	NA	0.085
	Stellwagen Bank	162	39.941	0	NA	0.000
	Massachusetts Bay (Additional)	6	0.482	0	NA	0.000
	Subtotal (Additional 2010 HPTRP MAs)	376	170.408	11	NA	0.065
	New England Non-HPTRP Areas					
	Other	723	282.178	2	NA	0.007
	Areas Associated with Consequence Closure Areas (CCAs)					
	Areas Associated with Gulf of Maine CCA (includes Massachusetts Bay, Stellwagen Bank, and Mid-Coast Management Areas)	472	117.637	7	NA	0.060
	Areas Associated with the Eastern Cape Cod and Cape Cod South Expansion CCAs (includes Cape Cod South)	269	160.856	12	NA	0.075
	Subtotal (Areas Associated with Consequence Closure Areas (CCAs))	741	278.493	19	NA	0.068
	Mid-Atlantic Management Areas					
Mid-Atlantic	*1998 HPTRP MAs*					
	Mudhole North	11	3.138	0	63.6%	0.000
	Southern Mid-Atlantic	109	30.851	0	52.3%	0.000
	Waters off New Jersey (including 2010 Mudhole South, but not 1998 Mudhole North)*	78	15.992	8	53.9%	0.500
	Subtotal (1998 HPTRP MAs)	198	49.981	8	53.5%	0.160
	Additional 2010 HPTRP Management Areas					
	Mudhole South (included in 1998 Waters off New Jersey)	29	4.668	1	NA	0.214
	Mid-Atlantic Non-HPTRP Areas					
	Other	1694	249.459	0	NA	0.000

* Waters off New Jersey includes the one Mudhole South haul that was listed in its own row in Table 1.

Table 8. Bycatch rates (number of observed harbor porpoises per observed mtons of landings) by 1998 and 2010 New England Harbor Porpoise Take Reduction Plan (HPTRP) times and areas and pinger usage. No pingers were required in the Mid-Atlantic, so this region was not assessed for pinger use bycatch rates.

Time Period	1998 and 2010 HPTRP Management or Closure Areas	Full Pinger Use	Observed Hauls	Observed Landings (mtons)	Observed Harbor Porpoise	Bycatch Rate
	1998 HPTRP Management Areas					
Dec 1 - May 31	Cape Cod South	No	9	4.657	0	0
Dec 1 - May 31	Cape Cod South	Yes	52	26.213	1	0.038
Dec 1 - May 31	Mass. Bay (1998 HPTRP)	No	39	6.15	0	0
Dec 1 - May 31	Mass. Bay (1998 HPTRP)	Yes	29	5.241	1	0.191
Sep 15 - May 31	Mid-Coast	No	127	35.113	5	0.142
Sep 15 - May 31	Mid-Coast	Yes	109	30.71	1	0.033
Nov 1 - May 31	Offshore	No	133	49.497	0	0
Nov 1 - May 31	Offshore	Yes	36	14.22	0	0
	Additional 2010 HPTRP Management Areas					
Nov 1 - May 31	Mass. Bay (Additional, not included in 1998 HPTRP)	No	2	0.092	0	0
Nov 1 - May 31	Mass. Bay (Additional, not included in 1998 HPTRP)	Yes	4	0.39	0	0
Dec 1 - May 31	Southern New England (not including Cape Cod South)	No	180	110.218	9	0.082
Dec 1 - May 31	Southern New England (not including Cape Cod South)	Yes	28	19.767	2	0.101
Nov 1 - May 31	Stellwagen Bank	No	132	34.199	0	0
Nov 1 - May 31	Stellwagen Bank	Yes	30	5.742	0	0
	Areas Associated with Consequence Closure Areas (CCAs)					
Sept15/Nov 1/Dec 1 - May 31	Areas Associated with the Gulf of Maine CCA	No	300	75.554	5	0.066
Sept15/Nov 1/Dec 1 - May 31	Areas Associated with the Gulf of Maine CCA	Yes	172	42.083	2	0.048
Dec 1 - May 31	Areas Associated with the Eastern Cape Cod and Cape Cod South Expansion CCAs	No	189	114.875	9	0.078
Dec 1 - May 31	Areas Associated with the Eastern Cape Cod and Cape Cod South Expansion CCAs	Yes	80	45.980	3	0.065
All MA Time Periods	*All New England Management Areas*	No	622	239.926	14	0.058
All MA Time Periods	*All New England Management Areas*	Yes	288	102.283	5	0.049

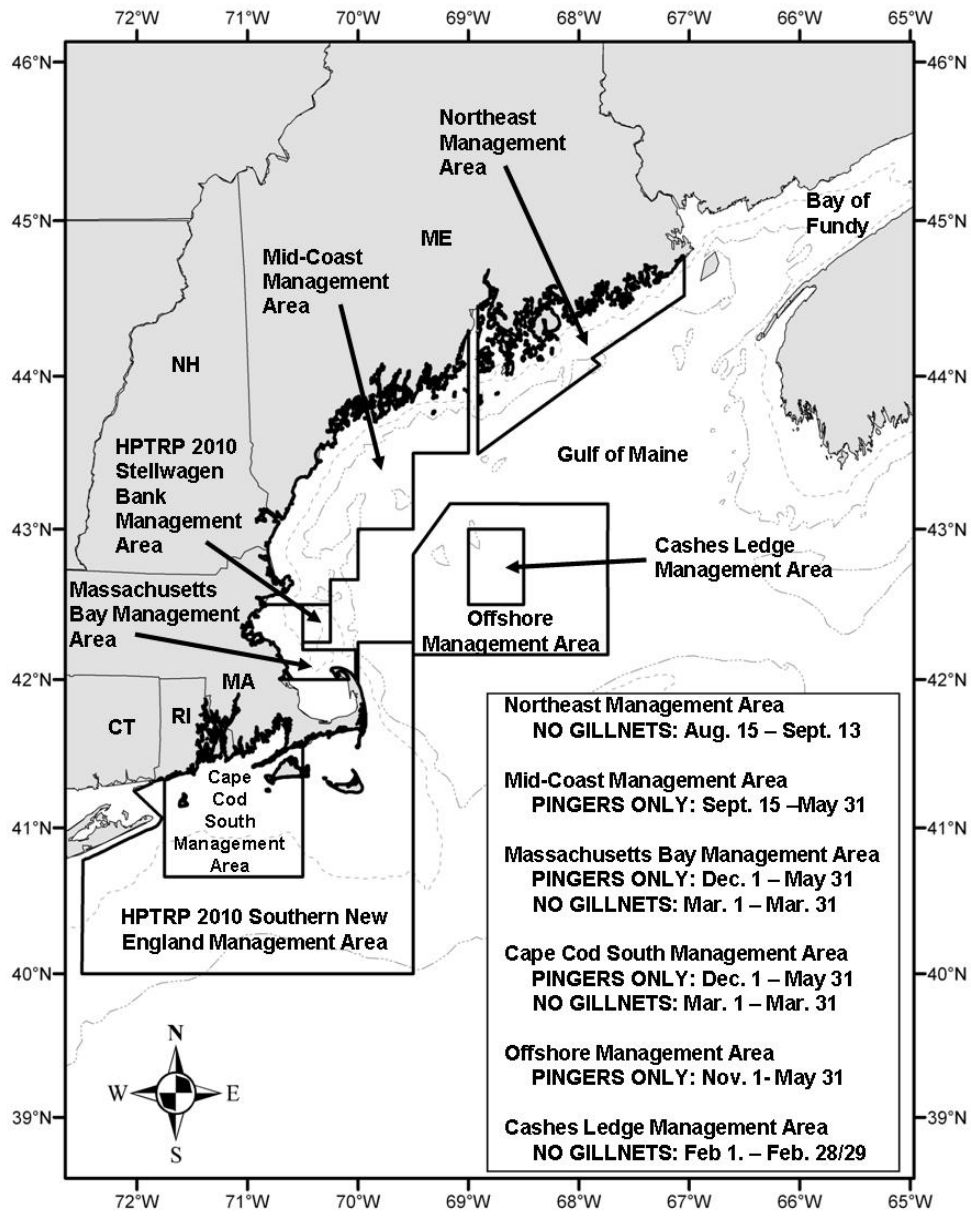

Figure 1A. 1998 New England Harbor Porpoise Take Reduction Plan (HPTRP) Management Areas (MAs) and the management measures associated with them depicted prior to the 2010 HPTRP amendments, and two additional 2010 HPTRP MAs. Note that under the 2010 HPTRP amendments, part of the Massachusetts Bay MA is expanded slightly to the north, eliminating the small gap between it and the 2010 HPTRP Stellwagen Bank MA to the north. Under the 2010 HPTRP amendments, the time period for the Massachusetts Bay MA is lengthened to include November, which matches the time period for the adjacent 2010 HPTRP Stellwagen Bank MA (Nov 1 – May 31). The time period for the 2010 HPTRP pinger requirement in the Southern New England MA is from Dec 1 through May 31. For more information on the 1998 and 2010 HPTRP regulations, see the NOAA Fisheries Service Northeast Regional Office's HPTRP website at: www.nero.noaa.gov/hptrp.

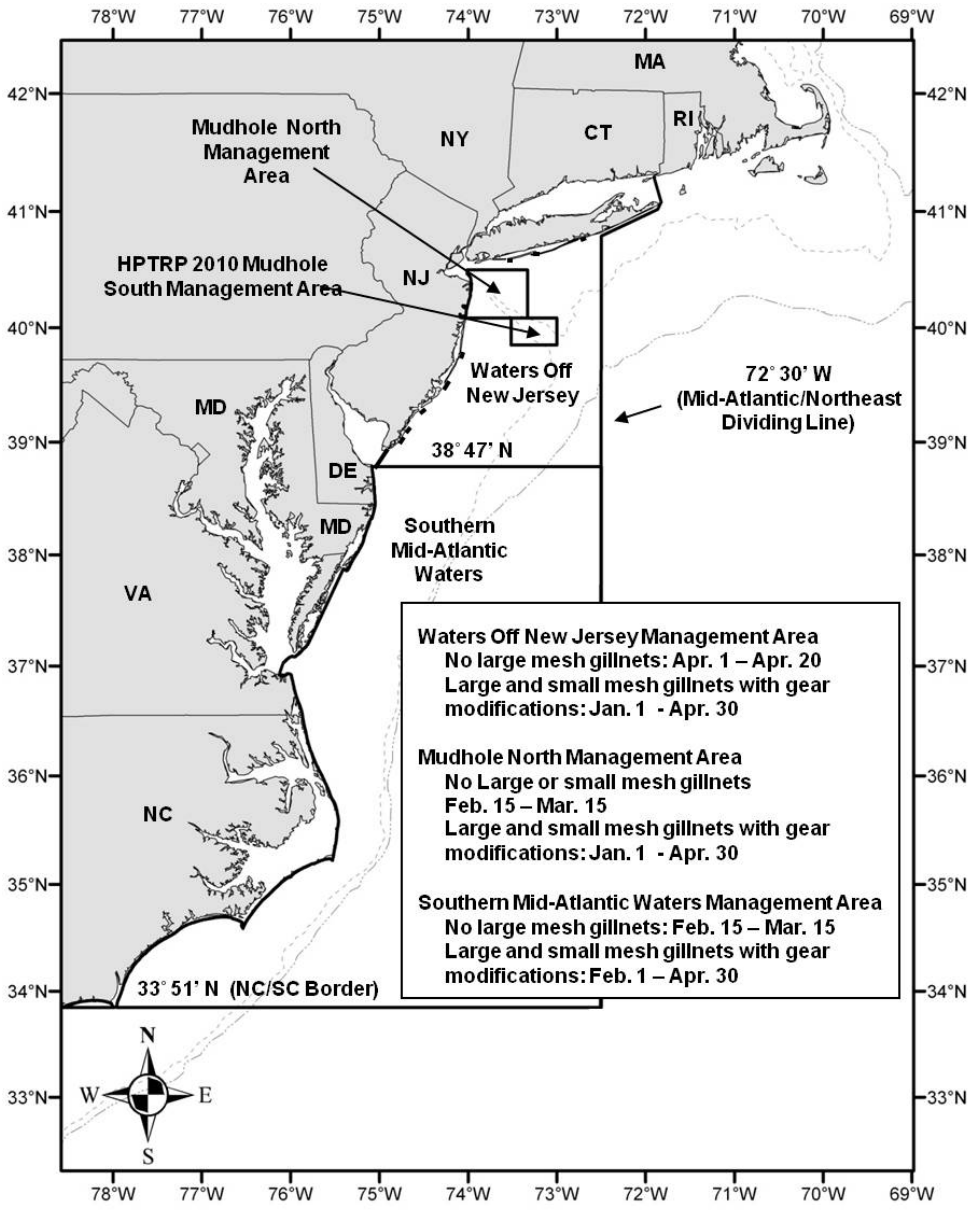

Figure 1B. 1998 Mid-Atlantic Harbor Porpoise Take Reduction Plan (HPTRP) Management Areas (MA) and a summary of the associated regulations, and the additional 2010 HPTRP Mudhole South MA. Under the 2010 HPTRP amendments, the Mudhole South MA is closed to gillnet gear from February 1 through March 15, and gear modification requirements are mandatory from January 1 through April 30, except when the Waters off New Jersey MA closure applies for large mesh gillnets (April 1-20). The boundary shown between New England and the Mid-Atlantic components of the 2010 HPTRP is the boundary that intersects the south shore of Long Island. For more details on the 1998 HPTRP gear modification requirements, see Table 2. For more information on both the 1998 and 2010 HPTRP regulations, see the NOAA Fisheries Service Northeast Regional Office's HPTRP website at: www.nero.noaa.gov/hptrp

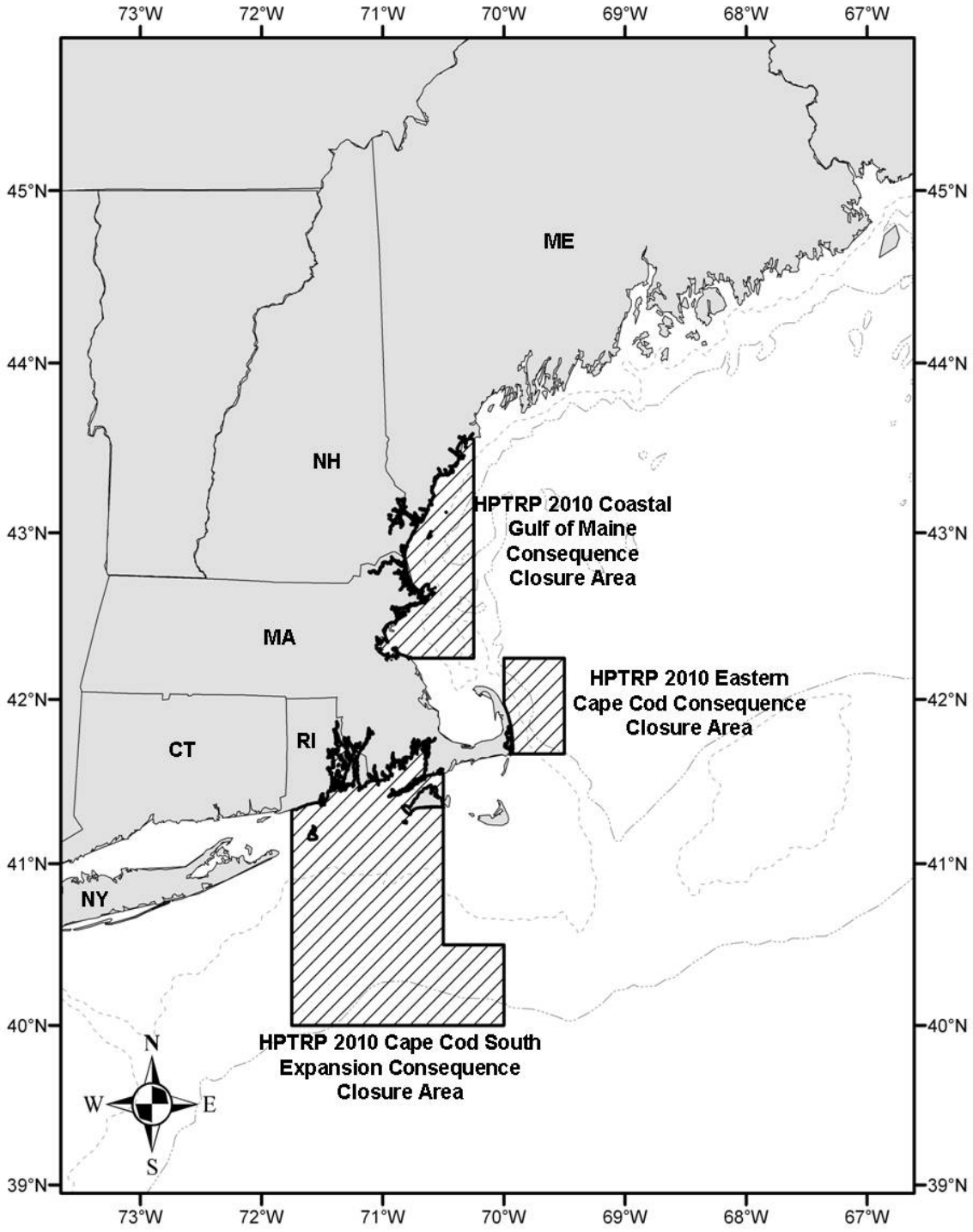

Figure 1C. 2010 Harbor Porpoise Take Reduction Plan (HPTRP) seasonal Consequence Closure Areas (CCA). For more information on these regulations, see the NOAA Fisheries Service Northeast Regional Office's HPTRP website at: www.nero.noaa.gov/hptrp

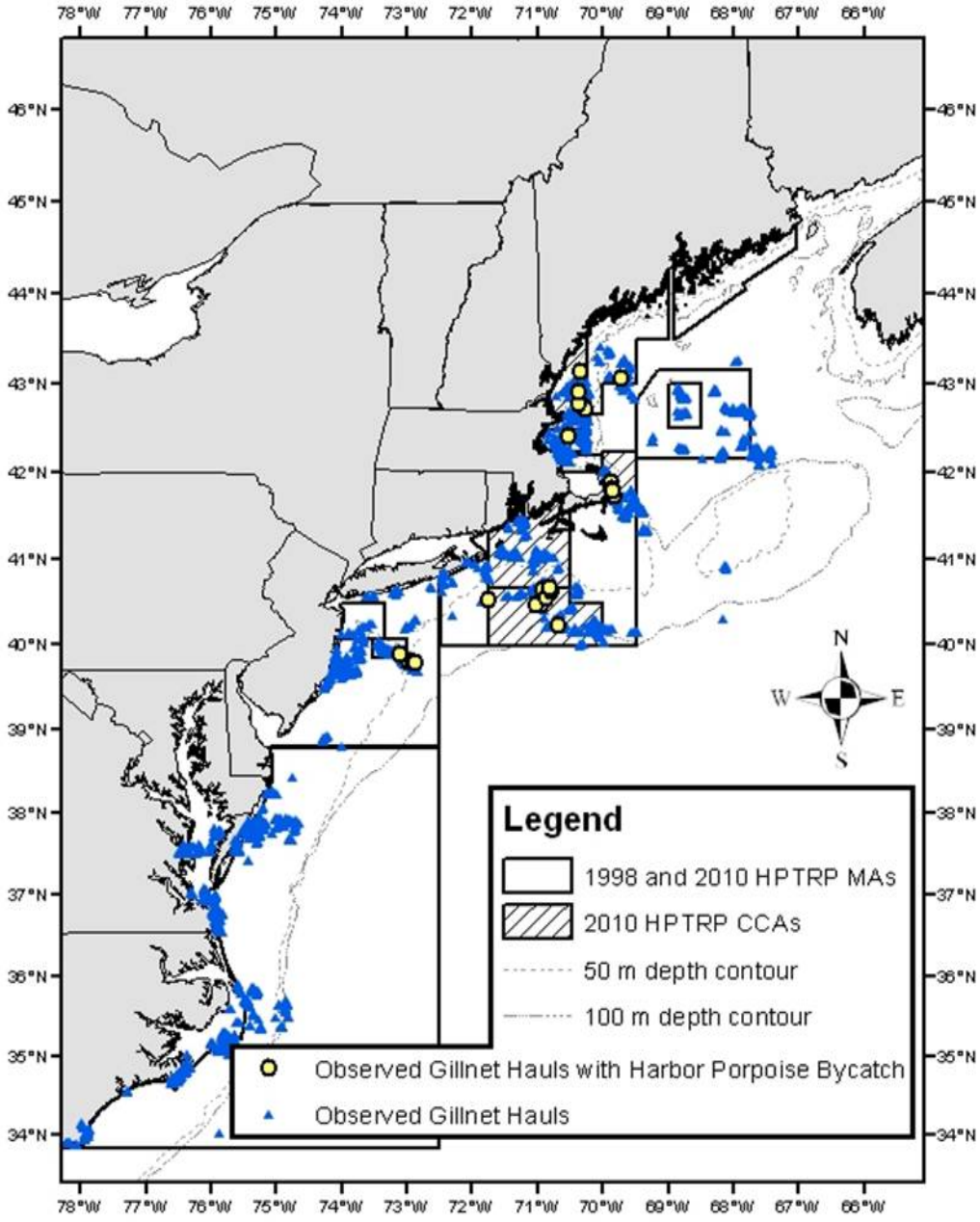

Figure 2. Location of Northeast Fisheries Observer Program (NEFOP) observed gillnet hauls without harbor porpoise takes (blue triangles) and observed hauls with harbor porpoise bycatch (yellow circles) from June 2009 through May 2010. These are overlaid on top of the 1998 and 2010 HPTRP Management Areas (MAs) as shown in Figures 1a and 1b. The hatched areas depict Consequence Closure Areas (CCAs) as shown in Figure 1c.

Procedures for Issuing Manuscripts in the *Northeast Fisheries Science Center Reference Document* (CRD) Series

Clearance

All manuscripts submitted for issuance as CRDs must have cleared the NEFSC's manuscript/abstract/webpage review process. If any author is not a federal employee, he/she will be required to sign an "NEFSC Release-of-Copyright Form." If your manuscript includes material from another work which has been copyrighted, then you will need to work with the NEFSC's Editorial Office to arrange for permission to use that material by securing release signatures on the "NEFSC Use-of-Copyrighted-Work Permission Form."

For more information, NEFSC authors should see the NEFSC's online publication policy manual, "Manuscript/abstract/webpage preparation, review, and dissemination: NEFSC author's guide to policy, process, and procedure," located in the Publications/Manuscript Review section of the NEFSC intranet page.

Organization

Manuscripts must have an abstract and table of contents, and (if applicable) lists of figures and tables. As much as possible, use traditional scientific manuscript organization for sections: "Introduction," "Study Area" and/or "Experimental Apparatus," "Methods," "Results," "Discussion," "Conclusions," "Acknowledgments," and "Literature/References Cited."

Style

The CRD series is obligated to conform with the style contained in the current edition of the United States Government Printing Office Style Manual. That style manual is silent on many aspects of scientific manuscripts. The CRD series relies more on the CSE Style Manual. Manuscripts should be prepared to conform with these style manuals.

The CRD series uses the American Fisheries Society's guides to names of fishes, mollusks, and decapod crustaceans, the Society for Marine Mammalogy's guide to names of marine mammals, the Biosciences Information Service's guide to serial title abbreviations, and the ISO's (International Standardization Organization) guide to statistical terms.

For in-text citation, use the name-date system. A special effort should be made to ensure that all necessary bibliographic information is included in the list of cited works. Personal communications must include date, full name, and full mailing address of the contact.

Preparation

Once your document has cleared the review process, the Editorial Office will contact you with publication needs – for example, revised text (if necessary) and separate digital figures and tables if they are embedded in the document. Materials may be submitted to the Editorial Office as files on zip disks or CDs, email attachments, or intranet downloads. Text files should be in Microsoft Word, tables may be in Word or Excel, and graphics files may be in a variety of formats (JPG, GIF, Excel, PowerPoint, etc.).

Production and Distribution

The Editorial Office will perform a copy-edit of the document and may request further revisions. The Editorial Office will develop the inside and outside front covers, the inside and outside back covers, and the title and bibliographic control pages of the document.

Once both the PDF (print) and Web versions of the CRD are ready, the Editorial Office will contact you to review both versions and submit corrections or changes before the document is posted online.

A number of organizations and individuals in the Northeast Region will be notified by e-mail of the availability of the document online.

Research Communications Branch
Northeast Fisheries Science Center
National Marine Fisheries Service, NOAA
166 Water St.
Woods Hole, MA 02543-1026

MEDIA MAIL

Publications and Reports of the Northeast Fisheries Science Center

The mission of NOAA's National Marine Fisheries Service (NMFS) is "stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment." As the research arm of the NMFS's Northeast Region, the Northeast Fisheries Science Center (NEFSC) supports the NMFS mission by "conducting ecosystem-based research and assessments of living marine resources, with a focus on the Northeast Shelf, to promote the recovery and long-term sustainability of these resources and to generate social and economic opportunities and benefits from their use." Results of NEFSC research are largely reported in primary scientific media (*e.g.*, anonymously-peer-reviewed scientific journals). However, to assist itself in providing data, information, and advice to its constituents, the NEFSC occasionally releases its results in its own media. Currently, there are three such media:

NOAA Technical Memorandum NMFS-NE -- This series is issued irregularly. The series typically includes: data reports of long-term field or lab studies of important species or habitats; synthesis reports for important species or habitats; annual reports of overall assessment or monitoring programs; manuals describing program-wide surveying or experimental techniques; literature surveys of important species or habitat topics; proceedings and collected papers of scientific meetings; and indexed and/or annotated bibliographies. All issues receive internal scientific review and most issues receive technical and copy editing.

Northeast Fisheries Science Center Reference Document -- This series is issued irregularly. The series typically includes: data reports on field and lab studies; progress reports on experiments, monitoring, and assessments; background papers for, collected abstracts of, and/or summary reports of scientific meetings; and simple bibliographies. Issues receive internal scientific review and most issues receive copy editing.

Resource Survey Report (formerly *Fishermen's Report*) -- This information report is a regularly-issued, quick-turnaround report on the distribution and relative abundance of selected living marine resources as derived from each of the NEFSC's periodic research vessel surveys of the Northeast's continental shelf. This report undergoes internal review, but receives no technical or copy editing.

TO OBTAIN A COPY of a *NOAA Technical Memorandum NMFS-NE* or a *Northeast Fisheries Science Center Reference Document*, either contact the NEFSC Editorial Office (166 Water St., Woods Hole, MA 02543-1026; 508-495-2350) or consult the NEFSC webpage on "Reports and Publications" (http://www.nefsc.noaa.gov/nefsc/publications/). To access *Resource Survey Report*, consult the Ecosystem Surveys Branch webpage (http://www.nefsc.noaa.gov/femad/ecosurvey/mainpage/).

ANY USE OF TRADE OR BRAND NAMES IN ANY NEFSC PUBLICATION OR REPORT DOES NOT IMPLY ENDORSEMENT.