New England Harbor Porpoise
Bycatch Rates During 2010-2012
Associated with Consequence Closure Areas

by Christopher D. Orphanides
New England Harbor Porpoise Bycatch Rates During 2010-2012 Associated with Consequence Closure Areas

by Christopher D. Orphanides

National Oceanic Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA, 02543 USA

September 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. This report was reviewed by the Stock Assessment Review Committee, a panel of assessment experts from the Center for Independent Experts (CIE), University of Miami.

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:

TABLE OF CONTENTS

Abstract ......................................................................................................................................................... 1
Introduction ................................................................................................................................................... 1
Methods ........................................................................................................................................................ 2
Data ............................................................................................................................................................ 2
Bycatch Rates ............................................................................................................................................ 3
  2011-2012 Pinger Compliance Rates ........................................................................................................ 4
Results ........................................................................................................................................................ 5
Discussion .................................................................................................................................................... 6
Acknowledgements ....................................................................................................................................... 7
References Cited ........................................................................................................................................... 8

LIST OF TABLES

Table 1. Observed incidentally taken harbor porpoise, landings, trips, and percent Northeast
Fishery Observer Program (NEFOP) groundfish trip landings by Consequence Closure Area
(CCA)-associated-area in the New England gillnet fishery for the 2011-2012 HPTRP
management season. ................................................................................................................................. 10

Table 2. Bycatch rates, coefficients of variations (CVs), and hauls by Consequence Closure Area
(CCA)-associated area in the New England gillnet fishery for the 2010-2011 (year 1), 2011-2012
(year 2), and combined 2010-2012 Harbor Porpoise Take Reduction Plan (HPTRP) management
seasons. ....................................................................................................................................................... 10

Table 3. Estimated Harbor Porpoise Take Reduction Plan (HPTRP) pinger compliance in the
New England gillnet fishery during the 2011-2012 HPTRP management season. ............................... 11

LIST OF FIGURES

Figure 1. Harbor Porpoise Take Reduction Plan (HPTRP) New England gillnet management and
closure areas ............................................................................................................................................... 12

Figure 2. Harbor Porpoise Take Reduction Plan (HPTRP) New England gillnet Consequence
Closure Areas (CCAs). ............................................................................................................................... 13

Figure 3. Northeast Fishery Observer Program (NEFOP) observed gillnet hauls and harbor
porpoise bycatch locations for the 2011-2012 Harbor Porpoise Take Reduction Plan (HPTRP)
management season. ................................................................................................................................. 14

Figure 4. At-Sea-Monitor (ASM) observed gillnet hauls and harbor porpoise bycatch locations
for the 2011-2012 Harbor Porpoise Take Reduction Plan (HPTRP) management season. ................. 15
ABSTRACT

The New England component of the Harbor Porpoise Take Reduction Plan (HPTRP) requires bycatch rates to be below HPTRP target bycatch rates in specified areas when averaged over two consecutive management seasons to avoid seasonal closure of Consequence Closure Areas (CCAs). Bycatch rates and HPTRP compliance rates were calculated for the Coastal Gulf of Maine (CGOM) and Southern New England (SNE) CCA-associated areas for the 2011-2012 HPTRP management season and combined with previous estimates from the 2010-2011 season (Orphanides and Palka 2012). Bycatch rates (harbor porpoise per metric ton of landings) during the 2011-2012 season calculated using Northeast Fisheries Observer Program (NEFOP) data were 0.043 (CV=36%) in CGOM and 0.029 in SNE (CV=54%). The resulting two-year average bycatch rates (2010-2012) were 0.057 (CV=25%) in CGOM and 0.020 in SNE (CV=47%). These rates were above the target bycatch rate in CGOM (0.031) and below the target bycatch rate in SNE (0.023). For comparative purposes, bycatch rates were also calculated using a combination of At-Sea Monitor (ASM) data, a data source which began in 2010, and the traditionally used NEFOP data. Joint 2011-2012 NEFOP-ASM bycatch rates were 0.038 (CV=23%) for CGOM and 0.035 (CV=46%) for SNE, resulting in two-year bycatch rates of 0.053 (CV=14%) in CGOM and 0.042 (CV=32%) in SNE. Compliance with HPTRP pinger regulations was also evaluated. HPTRP pinger compliance (pingers fully deployed and all fully functional) was estimated to be 62.0% in CGOM and 73.2% in SNE.

INTRODUCTION

Since the creation of the Northeast Fisheries Science Center (NEFSC) Northeast Fishery Observer Program (NEFOP) in 1989, harbor porpoise bycatch has been the focus of much attention due to frequently observed incidental takes in commercial gillnet fisheries. In response to high levels of observed harbor porpoise incidental mortality and serious injury, Harbor Porpoise Take Reduction Teams (HPTRTs) were convened for the Gulf of Maine in 1996 and for the Mid-Atlantic in 1997, and were reconvened for both regions combined in 2007. As a result of reconvening the HPTRT in 2007, on February 19, 2010 NMFS published the 2010 HPTRP (75 FR 7383) to address both non-compliance with existing HPTRP requirements and bycatch that was occurring outside of existing HPTRP management areas. One of the key new components in the 2010 HPTRP that was developed to address non-compliance in areas with historically high levels of bycatch was the Consequence Closure Area (CCA) strategy. This strategy involves three potential seasonal closure areas, which are referred to as CCAs. Under this strategy, if the average bycatch rate within two consecutive management seasons in a “CCA-associated area” exceeds a specified target bycatch rate, then a seasonal closure of the CCA is triggered. These target bycatch rates were set to match previously observed bycatch rates within CCA-associated areas on NEFOP-observed hauls with full pinger deployment that were observed between January 1, 1999 and May 31, 2007 (Palka and Orphanides, 2008). CCA-associated areas encompass CCAs and are composed of existing Management Areas (MAs). The Coastal Gulf of Maine (CGOM) CCA-associated area is composed of the Mid-Coast, Stellwagen Bank, and Massachusetts Bay MAs (Figure 1), which also include the CGOM CCA (Figure 2). The target bycatch rate for the CGOM CCA-associated area is 0.031 harbor porpoise per metric ton of landings; if that rate is exceeded after two consecutive management seasons, the CGOM CCA becomes seasonally closed under the 2010 HPTRP. The
Southern New England (SNE) CCA-associated area is the Southern New England MA (Figure 1), which includes the Eastern Cape Cod CCA and the Cape Cod South Expansion CCA (Figure 2). The target bycatch rate for the SNE CCA is 0.023 harbor porpoise per metric ton of landings, and if that rate is exceeded after two consecutive management seasons, both the Eastern Cape Cod and Cape Cod South Expansion CCAs become seasonally closed. For details on the time period each MA is either seasonally closed to gillnet fishing or requires the use of pingers, see Figure 1.

The first management season under the 2010 HPTRP CCA strategy was the 2010-2011 HPTRP management season, which was from Sept 15, 2010 to May 31, 2011. CCA bycatch rates and compliance with the pinger requirements for that season were documented in Orphanides and Palka (2012). The current report provides a similar update for the second HPTRP management season (Sept 15, 2011 to May 31, 2012). This report also provides the first two-year average bycatch rates for each CCA.

METHODS

Data

The NEFOP data and At-Sea-Monitor (ASM) data were used to calculate bycatch and compliance rates. The NEFSC NEFOP was initiated in 1989 to document the bycatch of marine mammals taken incidentally in commercial fishing operations (Waring et al. 2004). Its role has since expanded to monitor commercial fishing from Maine through North Carolina, collecting, maintaining, and distributing data for scientific and management purposes. To achieve these and other goals, NEFOP collects data on landed and discarded catch, numerous fishing vessel and gear characteristics, and many other variables. For additional details on the data collected, see the NEFOP Fisheries Observer Program Manual for 2010 at http://www.nefsc.noaa.gov/fsb.

The ASM program was established in response to Amendment 16 of the Northeast Multispecies Fishery Management Plan (FMP) to monitor catch and discards in the large mesh portion of this fishery, often referred to as the “groundfish” fishery. Specifically, ASM data are used to monitor Annual Catch Entitlements (ACE) and Annual Catch Limits (ACL) of each stock managed by the FMP as of May 1, 2010 and to verify area fished as well as catch and discards by species and gear type (NOAA Fisheries 2011, 15 CFR Part 902, 50 CFR Part 648). When using the ASM data for calculating harbor porpoise bycatch rates, care was taken to combine the ASM data with NEFOP data in a manner that ensured the final sample was representative of the groundfish/non-groundfish (i.e., Northeast Multispecies fishery/other fisheries) distribution in the NEFOP data (see Bycatch Rates section of the Methods below for more details). For complete information on the fields collected in ASM see the ASM Program Manual at http://www.nefsc.noaa.gov/fsb, and for additional background on ASM data and the relationship between NEFOP and ASM data see Orphanides and Palka (2012).

The 2011-2012 datasets (NEFOP and ASM) were processed using standard protocols established for past bycatch and compliance calculations (e.g., Orphanides 2011; Orphanides and Palka 2012). Specifically, the 2011-2012 recorded dressed landed weights were converted to live weights using established conversion factors (Warden and Orphanides 2008; Palmer 2010) and rare missing location values were imputed using medians from representative strata using methods described in Warden and Orphanides (2008). For the 2011-2012 data, original location values were present in over 99% of SNE and CGOM hauls, and no incidental harbor porpoise takes were associated with imputed locations in CCA-associated areas. One NEFOP haul was
located on the border of the SNE and Massachusetts Bay MAs. This haul was counted as only being located in the SNE MA since most other hauls on that trip occurred in the SNE MA and none occurred in the Massachusetts Bay MA.

**Bycatch Rates**

Bycatch rates were calculated as the number of observed harbor porpoise incidental takes per observed metric tons (mtons) of live fish landed. All bycatch rates discussed in this report can be assumed to be in terms of harbor porpoise incidental takes per metric tons of live fish landed. A harbor porpoise incidental take was defined as any observed incidentally caught harbor porpoise that was recorded as either alive or dead. In some cases, it was possible that a decomposed harbor porpoise could be an animal that was dead prior to being entangled in a gillnet. Therefore, if an incidental take was recorded as being either moderately or severely decomposed when incidentally caught, the gear’s soak duration was examined to see if the incidental take could have reached the recorded state of decomposition within the given soak time, i.e., whether the harbor porpoise could have been alive when entangled in the net. No harbor porpoise were excluded due to decomposition status in the 2011-2012 season.

When calculating bycatch rates using only the NEFOP data (NEFOP Byc\_CCA), the number of harbor porpoise observed incidentally taken in a CCA associated time-area (NEFOP Observed Takes\_CCA) was divided by the amount of effort (metric tons of live fish landed) in the corresponding CCA associated time-area (NEFOP Observed Effort\_CCA):

$$\text{NEFOP Byc}_\text{CCA} = \frac{\text{NEFOP Observed Takes}_\text{CCA}}{\text{NEFOP Observed Effort}_\text{CCA}}$$

Calculating bycatch rates using NEFOP and ASM data (Joint NEFOP ASM Byc\_CCA) was slightly more complicated because it was necessary to account for the fact that the ASM data were the result of a higher observer coverage as compared to the NEFOP data and the ASM data were only recorded from groundfish trips:

$$\text{Joint NEFOP ASM Byc}_\text{CCA} = (\text{Groundfish}\%_\text{CCA} \times \text{GroundfishByc}_\text{CCA}) + (\text{NonGroundfish}\%_\text{CCA} \times \text{NonGroundfishByc}_\text{CCA})$$

The ASM data are by definition a subset of the entire gillnet fishery as it is designed to only sample groundfish trips. In contrast, the NEFOP data are designed to be a sample of the entire gillnet fishery. When calculating the joint NEFOP-ASM bycatch rates, NEFOP data were separated into groundfish and non-groundfish trip types using the NEFOP sector id code (NOAA Fisheries 2010). The NEFOP groundfish trips were then pooled with the ASM groundfish trips and used to calculate a groundfish bycatch rate for each CCA associated time-area (GroundfishByc\_CCA). Similarly, non-groundfish NEFOP data were used to calculate a non-groundfish bycatch rate for each CCA associated time-area (NonGroundfishByc\_CCA). Next, steps were taken to preserve the groundfish/non-groundfish ratio of the NEFOP data and retain consistency with how the target bycatch rates were originally calculated from only NEFOP data. The percentage of landings from the two trip types (groundfish and non-groundfish) was recorded for each CCA associated time-area (Groundfish\%_CCA and NonGroundfish\%_CCA). These percentages were then used to weight the groundfish and non-groundfish bycatch rates. Thus, the weighted groundfish bycatch rate had an influence proportional to the percentage of groundfish trip landings in the NEFOP data.
Once the NEFOP-only and joint NEFOP-ASM bycatch rates for 2010-2011 and 2011-
2012 HPTRP management seasons were calculated, two-year average bycatch rates were
calculated using a weighted average of the estimates from those two management seasons, or
“years,” as described in Palka and Orphanides (2008). The two year average is weighted by the
number of observed hauls in each HPTRP management season.

\[ 2 \text{Yr Weighted Avg Byc Rate} = \]

\[ \frac{\text{Yr1 Byc Rate} \ast \text{Yr1 N of Obs Hauls} + \text{Yr2 Byc Rate} \ast \text{Yr2 N of Obs Hauls}}{\text{Yr1 Observed Hauls} + \text{Yr2 Observed Hauls}} \]

For both the NEFOP-only bycatch rates and the joint NEFOP-ASM bycatch rates, the
number of observed hauls in the NEFOP data was used to weight the two year average. For the
joint NEFOP-ASM two-year bycatch rates, weighting with only NEFOP hauls was done to keep
the ASM groundfish hauls from having a disproportionate influence on the final bycatch rates.

Standard bootstrapping techniques were used to derive the coefficients of variation (CV)
and 95% confidence intervals (CIs) for the bycatch estimates for each 2011-2012 stratum, as has
been done for past bycatch estimates (e.g., Orphanides and Palka 2012). Also consistent with
past estimates, the re-sampling unit used was an entire trip rather than an individual haul to
ensure that any trip-based characteristics that might influence bycatch rates were carried over
into the estimated CV (Bisack 2003). The two HPTRP season bycatch rates and their associated
CVs were used to derive the two-year bycatch rate CVs using the following equation:

\[ \text{CV (2 Yr Weighted Avg Byc Rate)} = \]

\[ \frac{\sqrt{((\text{Yr1 Weight}^2) \ast \text{var(\text{Yr1 Byc Rate})}) + ((\text{Yr2 Weight}^2) \ast \text{var(\text{Yr2 Byc Rate})})}}{2 \text{ Yr Weighted Avg Byc Rate}} \]

where

\[ \text{Yr1 Weight} = \frac{\text{Yr1 N Obs Hauls}}{\text{Yr1 N Obs Hauls} + \text{Yr2 N Obs Hauls}} \]

\[ \text{Yr2 Weight} = \frac{\text{Yr2 N Obs Hauls}}{\text{Yr1 N Obs Hauls} + \text{Yr2 N Obs Hauls}} \]

and

\[ \text{var(\text{Yr1 Byc Rate})} = (\text{Yr1 Byc Rate} \ast \text{CV(\text{Yr1 Byc Rate})})^2 \]

\[ \text{var(\text{Yr2 Byc Rate})} = (\text{Yr2 Byc Rate} \ast \text{CV(\text{Yr2 Byc Rate})})^2 \]

2011-2012 Pinger Compliance Rates

During times and areas where pingers are required in the New England gillnet fisheries,
the 2010 HPTRP requires that each gillnet string has one functioning pinger on each end of the
string, and one functioning pinger in between each net. For example, a typical gillnet string with
10 300-foot long nets is required to have 11 functioning pingers on the string. In the past, the measure of compliance was often calculated based only on whether a gillnet haul had the proper number of pingers on the string because the functionality of the pingers was not regularly recorded by NEFOP (Palka et al. 2008, Orphanides et al. 2009). Use of the proper number of pingers on a string, regardless of whether the pinger is working, will be referred to here as full pinger deployment.

Recently, NEFOP developed a new pinger tester that was deployed on a limited sample of NEFOP trips during 2011 and 2012 (none deployed on ASM trips). On those trips, the aim was to test all of the pingers on each string to determine if they were functioning properly. Pinger tester data from hauls with full pinger deployment were used to assess the true pinger compliance rate; that is, the number of tested hauls with both full pinger deployment and all pingers functional were divided by the number of tested hauls with full pinger deployment. The resulting number was the percent of hauls with fully deployed pingers that also had all pingers functioning. This percentage was then applied to the percentage of all NEFOP observed hauls with full pinger deployment (whether tested for pinger functionality or not) to estimate the true pinger compliance rate. For additional details on how pinger tester data were recorded, see Orphanides and Palka (2012). Compliance with HPTRP pinger regulations was assessed using only NEFOP data to be consistent with the previous year’s CCA analysis (Orphanides and Palka 2012), and because pinger tester data were only collected on NEFOP hauls. However, full pinger deployment was also summarized for ASM data.

RESULTS

The spatial distributions of the observed hauls and harbor porpoise takes collected by the NEFOP and ASM programs are similar (Figures 3 and 4). Between the NEFOP and ASM data 21 harbor porpoise were observed incidentally taken in CGOM CCA-associated areas and 8 were observed incidentally taken in SNE (Table 1). In CGOM the observed bycatch rates were above the target bycatch rate (0.031) in all cases (Table 2). The 2011-2012 CGOM bycatch rate was above the target when using NEFOP data (0.043, CV=36%) and when using the joint NEFOP-ASM data (0.038, CV=23%). The larger sample size of observed hauls in the joint NEFOP-ASM bycatch rate resulted in an increased level of confidence, and a lower CV. The two-year weighted average bycatch rates were also above the targets: 0.057 (CV=25%) for NEFOP and 0.053 for NEFOP-ASM (CV=14%) (Table 2).

In the 2011-2012 season, the SNE observed bycatch rates (0.029 for NEFOP, CV=54%, and 0.035 for NEFOP-ASM, CV = 46%) were above the SNE target bycatch rate (0.023) (Table 2). However, the two-year weighted average bycatch rate for SNE was below the target bycatch rate when using NEFOP data (0.020, CV = 47%) and above the target when using joint NEFOP-ASM data (0.042, CV=32%).

Compliance with pinger regulations was estimated at 62% in CGOM and 73% in SNE. Full pinger deployment occurred on 80% of observed hauls in CGOM and 73% of hauls in SNE (Table 3). However, among CGOM hauls with full pinger deployment also tested for pinger functionality, about 23% did not have all pingers functioning. In SNE all tested pingers on hauls with full pinger deployment were functional, though the sample size was much smaller than in CGOM.
In this paper two sets of CCA bycatch rates were calculated. One set was calculated using only NEFOP data, and the other set was calculated using both NEFOP and ASM data. For the 2010-2011 HPTRP season, NOAA Fisheries Northeast Regional Office (NERO) decided to use NEFOP bycatch rates to evaluate bycatch rates within CCA-associated areas in order to maintain consistency with how the original CCA target bycatch rates were calculated. Compared to the 2010-2011 HPTRP season, the NEFOP 2011-2012 bycatch rates were lower in CGOM, but higher in SNE. Based on year one CCA data (2010-2011), it was determined that the bycatch rate in the CGOM CCA was too high to avoid a closure even if no harbor porpoise were caught in year two (2011-2012). This assertion proved correct, as the combined NEFOP two-year average bycatch rate was 0.057 (CV=25%) in CGOM, well above the 0.031 target. The corresponding two-year average bycatch rate in SNE was 0.020 (CV=47%), slightly below the target rate of 0.023.

In CGOM, the two-year bycatch rates were very comparable when calculated using NEFOP data (0.057, CV=25%) and when using joint NEFOP-ASM data (0.053, CV=14%). However, in SNE the two-year bycatch rates differed greatly between NEFOP data (0.020, CV=47%) and joint NEFOP-ASM data (0.042, 32%). The difference in rates between data sources is likely associated with sample size combined with the variability of observing a rare event like an incidental harbor porpoise take. The sample size of observed hauls (and landings) in SNE was smaller than in CGOM, whether looking at NEFOP, ASM, or joint datasets (Tables 1 and 2). Further, the sample size of hauls (and landings) in NEFOP data in SNE was much smaller than the sample size of ASM data in the region. Differences in the vessels sampled and their manner of fishing between NEFOP and ASM data could also contribute to the differences between these rates. An investigation comparing NEFOP and ASM data is currently underway.

The two-year bycatch rates calculated using joint NEFOP-ASM data were weighted using only the NEFOP hauls, though one might expect that both NEFOP and ASM hauls would be used to weight this bycatch rate. In this case, only NEFOP hauls were used so that the ASM groundfish hauls would not have a disproportionate effect on the final bycatch rates. However, one could argue that since ASM hauls were used to calculate the single-year bycatch rates, they should be used for the two-year rates as well. The best solution may be to use, but somehow down-weight, the number of ASM hauls in the weighting process when calculating the two-year average bycatch rate. But, in practice, weighting the two-year bycatch rate using both the ASM and NEFOP hauls made little difference in either the final two-year bycatch rate or CV. In a post-hoc analysis using both NEFOP and ASM hauls to weight the two-year bycatch rates, the CVs of neither region differed from when only NEFOP hauls were used to weight the two-year bycatch rates, and the bycatch rates shifted from 0.057 to 0.054 in CGOM and 0.040 to 0.042 in SNE.

It is possible that the high two-year bycatch rate in CGOM was due, at least in part, to a mixture of working and non-working pingers on the hauls with fully deployed pingers. Research in this fishery has shown that bycatch rates for hauls without pingers has been two to three times the rates of hauls with pingers (Palka et al. 2008). In addition, that study showed that hauls with insufficient numbers of pingers can have higher bycatch rates than hauls with the required number of pingers; however, the reason for this is not clear. Pinger functionality analysis found that roughly 80% of hauls in 2011-2012 with fully deployed pingers that were tested for functionality had all pingers functioning, compared to roughly 62% in 2010-2011 (Orphanides
and Palka 2012). The problem of non-functioning pingers has been consistent throughout this fishery, and it makes it challenging to assess the true capability of pingers to deter harbor porpoise within this fishery (Palka et al. 2008, Orphanides et al. 2009, Orphanides et al. 2010, Orphanides and Palka 2012). Other possible reasons for high bycatch rates may include shifts in fishing effort or harbor porpoise distributions, though these have not been investigated in this report. The most likely cause of high bycatch rates in CGOM is the low pinger compliance rates, though more data is needed to confirm the effect of missing or non-functional pingers on a string.

ACKNOWLEDGEMENTS

Special thanks to the NEFOP and ASM observers whose data make this analysis possible. Also, much gratitude is due to several NEFOP and DMS staff members who sped the processing of the NEFOP gillnet data in order to help get this paper published as quickly as possible. Thanks to Joshua Hatch for assistance preparing the data used in this analysis. Lastly, thanks to anonymous staff members at the NEFSC for their reviews and comments on this paper.
REFERENCES CITED


Table 1. Observed incidentally taken harbor porpoise, landings, trips, and percent Northeast Fishery Observer Program (NEFOP) groundfish trip landings by Consequence Closure Area (CCA)-associated-area in the New England gillnet fishery for the 2011-2012 HPTRP management season.

<table>
<thead>
<tr>
<th>CCA-Associated Area</th>
<th>NEFOP</th>
<th>ASM</th>
<th>NEFOP</th>
<th>ASM</th>
<th>NEFOP</th>
<th>ASM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Gulf of Maine</td>
<td>8 (8)</td>
<td>13 (13)</td>
<td>277</td>
<td>741</td>
<td>188.12 (187.21)</td>
<td>437.64 (437.64)</td>
</tr>
<tr>
<td>Southern New England</td>
<td>3 (0)</td>
<td>5 (5)</td>
<td>37</td>
<td>175</td>
<td>104.60 (62.78)</td>
<td>361.52 (361.52)</td>
</tr>
</tbody>
</table>

Table 2. Bycatch rates, coefficients of variations (CVs), and hauls by Consequence Closure Area (CCA)-associated area in the New England gillnet fishery for the 2010-2011 (year 1), 2011-2012 (year 2), and combined 2010-2012 Harbor Porpoise Take Reduction Plan (HPTRP) management seasons.

<table>
<thead>
<tr>
<th>CCA-Associated Area</th>
<th>Data Source(s)</th>
<th>Year 1 Bycatch rate (CV, Observed Hauls)</th>
<th>Year 2 Bycatch Rate (CV, Observed Hauls)</th>
<th>2-Year Weighted Average Bycatch Rate (CV)</th>
<th>HPTRP Target Bycatch Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Gulf of Maine</td>
<td>NEFOP</td>
<td>0.078 (34%, 883)</td>
<td>0.043 (36%, 1265)</td>
<td>0.057 (25%)</td>
<td>0.031</td>
</tr>
<tr>
<td>Coastal Gulf of Maine</td>
<td>NEFOP-ASM</td>
<td>0.074 (18%, 2589)</td>
<td>0.038 (23%, 3339)</td>
<td>0.053 (14%)</td>
<td>0.031</td>
</tr>
<tr>
<td>Southern New England</td>
<td>NEFOP</td>
<td>0.012 (96%, 238)</td>
<td>0.029 (54%, 205)</td>
<td>0.020 (47%)</td>
<td>0.023</td>
</tr>
<tr>
<td>Southern New England</td>
<td>NEFOP-ASM</td>
<td>0.048 (43%, 651)</td>
<td>0.035 (46%, 925)</td>
<td>0.042 (32%)</td>
<td>0.023</td>
</tr>
</tbody>
</table>
Table 3. Estimated Harbor Porpoise Take Reduction Plan (HPTRP) pinger compliance in the New England gillnet fishery during the 2011-2012 HPTRP management season.

<table>
<thead>
<tr>
<th>CCA-Associated Area</th>
<th>Data Source</th>
<th>Full pinger deployment hauls</th>
<th>Non-Full Pinger Deployment Hauls</th>
<th>Total Observed Hauls</th>
<th>Full Pinger Deployment Percentage</th>
<th>Recorded Hauls (and Trips) Tested for Pinger Functionality</th>
<th>Full Pinger Deployment Hauls (and Trips) Tested for Pinger Functionality</th>
<th>Functionality on Full Pinger Deployment Hauls</th>
<th>Percent Compliant Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Gulf of Maine</td>
<td>NEFOP</td>
<td>1012</td>
<td>253</td>
<td>1265</td>
<td>80.00%</td>
<td>214 (56)</td>
<td>120 (38)</td>
<td>77.50%</td>
<td>62.00%</td>
</tr>
<tr>
<td>Coastal Gulf of Maine</td>
<td>ASM</td>
<td>1647</td>
<td>427</td>
<td>2074</td>
<td>79.41%</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Southern New England</td>
<td>NEFOP</td>
<td>150</td>
<td>55</td>
<td>205</td>
<td>73.17%</td>
<td>12 (3)</td>
<td>10 (3)</td>
<td>100.00%</td>
<td>73.17%</td>
</tr>
<tr>
<td>Southern New England</td>
<td>ASM</td>
<td>578</td>
<td>142</td>
<td>720</td>
<td>80.28%</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
Figure 1. Harbor Porpoise Take Reduction Plan (HPTRP) New England gillnet management and closure areas.
Figure 2. Harbor Porpoise Take Reduction Plan (HPTRP) New England gillnet Consequence Closure Areas (CCAs).
Figure 3. Northeast Fishery Observer Program (NEFOP) observed gillnet hauls and harbor porpoise bycatch locations for the 2011-2012 Harbor Porpoise Take Reduction Plan (HPTRP) management season. Hatched area represents the year-round Western Gulf of Maine Closure Area under the Northeast Multispecies Fishery Management Plan (FMP). For a corresponding figure for the 2010-2011 season, see Orphanides and Palka (2012).
Figure 4. At-Sea-Monitor (ASM) observed gillnet hauls and harbor porpoise bycatch locations for the 2011-2012 Harbor Porpoise Take Reduction Plan (HPTRP) management season. Hatched area represents the year-round Western Gulf of Maine Closure Area under the Northeast Multispecies Fishery Management Plan (FMP). For a corresponding figure for the 2010-2011 season, see Orphanides and Palka (2012).
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.
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.