



Northeast Fisheries Science Center Reference Document 08-13

Predicted Harbor Porpoise Bycatch under Potential Mitigation Measure Scenarios

by Debra L. Palka

NOAA's National Marine Fisheries Serv, 166 Water St, Woods Hole MA 02543-1026

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

July 2008

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).

This document's publication history is as follows: manuscript submitted for review July 14, 2008; manuscript accepted through technical review July 17, 2008; manuscript accepted through policy review July 17, 2008; and final copy submitted for publication July 17, 2008. Pursuant to section 515 of Public Law 106-554 (the Information Quality Act), this information product has undergone a pre-dissemination review by the Northeast Fisheries Science Center, completed on July 17, 2008. The signed pre-dissemination review and documentation is on file at the NEFSC Editorial Office. This document may be cited as:

Palka DL. 2008. Predicted harbor porpoise bycatch under potential mitigation measure scenarios. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-13; 4 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents

Abstract.....	iv
List of Acronyms	iv
Introduction.....	1
Methods.....	1
Results.....	2
References.....	2

List of Tables

Table 1. Predicted harbor porpoise bycatch from 2005 under different potential take reduction management actions	3
Table 2. Predicted harbor porpoise bycatch from 2006 under different potential take reduction management actions	4

Abstract

During the Harbor Porpoise Take Reduction Team meeting in December 2007, questions were raised concerning what the predicted harbor porpoise bycatch would have been in 2005 and 2006 if: (a) the current Harbor Porpoise Take Reduction Plan (HPTRP) was followed (Scenario I); (b) if, in addition, pingers had been used in the entire Northeast gillnet fishery (Scenario II); and (c) if, in addition, the gillnet fishery off of New Jersey, including the Mudhole area, had also used pingers (Scenario III). Using the observed data collected since the implementation of the HPTRP, average bycatch rates of harbor porpoise were estimated for each of these scenarios. Based on these estimated bycatch rates, the average predicted annual harbor porpoise bycatch in 2005 and 2006 under Scenario I (641 animals) would have been slightly above the Potential Biological Removal (PBR) level (610 animals). The average predicted annual bycatch under Scenario II (370 animals) would have been about 61% of PBR, and the predicted bycatch under Scenario III (243 animals) would have been about 40% of PBR. All of the estimates exceed the Zero Mortality Rate Goal (ZMRG) level of 61 animals.

List of Acronyms

HPTRP	=	Harbor Porpoise Take Reduction Plan
HPTRT	=	Harbor Porpoise Take Reduction Team
NEFOP	=	Northeast Fisheries Observer Program
PBR	=	Potential Biological Removal
VTR	=	Vessel Trip Report
ZMRG	=	Zero Mortality Rate Goal

Introduction

During discussions at the Harbor Porpoise Take Reduction Team (HPTRT) meeting, questions arose from HPTRT members regarding the effectiveness of the existing Harbor Porpoise Take Reduction Plan (HPTRP) and, in particular, the effectiveness of pingers as a bycatch reduction measure. To this end, the HPTRT requested information on what the bycatch of harbor porpoises would have been under three different bycatch mitigation scenarios. The predicted harbor porpoise bycatches under these scenarios could then be compared to current bycatch estimates to determine if the potential mitigation measure might reduce bycatches to below the Potential Biological Removal (PBR) level (currently 610 animals), or to levels below the Zero Mortality Rate Goal (ZMRG) level (currently 61 animals). The three scenarios were:

- I. What if there had been 100% compliance with the regulations specified in the HPTRP implemented on January 1, 1999 (NMFS 1998)?
- II. In addition to conditions under Scenario I, what if pingers has been required in the fall and winter for the entire Northeast gillnet fishery (in the Gulf of Maine and southern New England waters north of New York)?
- III. In addition to the conditions under Scenario II, what if pingers had been required in the waters off New Jersey, including the Mudhole area, during January to April?

Methods

The three scenarios were evaluated using fishing effort data from 2005 and 2006 as reported in the commercial dealer and Vessel Trip Report (VTR) databases, and harbor porpoise bycatch rates were derived from data collected by the Northeast Fisheries Observer Program (NEFOP) during 1 January 1999–31 May 2007. The bycatch rate for each scenario was estimated using the time and area strata developed for the 2005 and 2006 harbor porpoise bycatch estimates. Details on the 2005 and 2006 harbor porpoise bycatch estimates are provided in Belden (2007) and Belden and Orphanides (2007), respectively.

The Northeast gillnet fishery (referred to as “Northeast”) is prosecuted within Gulf of Maine and southern New England waters north and east of New York. For this fishery, winter is defined as January–May, summer as June–August, and fall as September–December. For the gillnet fishery in waters off New Jersey, including the Mudhole, (referred to as “NJ Mid-Atlantic”) only fishing activity between January and April was considered because this time period is when harbor porpoise takes had been documented in the Mid-Atlantic gillnet fishery.

Annual harbor porpoise bycatch under each of the scenarios was estimated by multiplying the estimated average bycatch rate for that scenario (see next paragraph) by the actual effort observed (metric tons [mtons] of fish landings) within each stratum in that scenario. This procedure assumes that: (1) landings are not affected by the assumed actions within each scenario; (2) the factors affecting the bycatch rate and landings in 2005 and 2006 were similar to those since the implementation of the HPTRP, that is since 1 January 1999; (3) a cause-and-effect relationship exists between the bycatch rate and the actions proposed in each of the

scenarios; and (4) the bycatch rate of hauls with pingers in the NJ Mid-Atlantic area is similar to the average bycatch rate observed in the Mid-coast Management Area.

From January 1999–May 2007, the average bycatch rate of observed hauls which used all of the required number of pingers in the Mid-coast Management Area was 0.041 harbor porpoises per mtons landed, and was 0.023 harbor porpoises per mtons landed in the Cape Cod South Management Area. In the NJ Mid-Atlantic area, the average bycatch rate of hauls in compliant with the HPTRP regulations was 0.203 harbor porpoises per mtons landed.

Results

Under Scenario I (Tables 1 and 2), the predicted annual harbor porpoise bycatch during 2005 and 2006 was 641 animals (651 in 2005, and 630 in 2006), slightly higher than the current value of PBR (610 animals).

Under Scenario II (Tables 1 and 2), the predicted annual harbor porpoise bycatch during 2005 and 2006 was 370 animals (367 in 2005, and 373 in 2006), about 61% of PBR.

Under Scenario III (Tables 1 and 2), the predicted annual harbor porpoise bycatch during 2005 and 2006 was 243 animals (246 in 2005, and 240 in 2006), about 40% of PBR.

All of the predicted bycatch estimates exceed the ZMRG level of 61 animals.

References

- Belden D. 2007. Estimates of cetacean and pinniped bycatch in the 2005 Northeast sink gillnet and Mid-Atlantic coastal gillnet fisheries. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 07-08; 16 p. Available at: <http://www.nefsc.noaa.gov/publications/crd/crd0708/>
- Belden D, Orphanides CD. 2007. Estimates of cetacean and pinniped bycatch in the 2006 Northeast sink gillnet and Mid-Atlantic coastal gillnet fisheries. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 07-20; 18 p. Available at: <http://www.nefsc.noaa.gov/publications/crd/crd0720/>
- National Marine Fisheries Service (NMFS). 1998. Taking of marine mammals incidental to commercial fishing operations; harbor porpoise take reduction plan regulations. Fed Regis. 63(231): 66464-66490.

Table 1. Predicted harbor porpoise bycatch from 2005 under different potential take reduction management actions

		Scenario I.		Scenario II.		Scenario III.	
Time/Area	2005 bycatch estimates	Bycatch when all hauls are in compliance under current TRP	Details about changes	Bycatch when required number of pingers used everywhere in NE (Winter and Fall)	Details about changes	Bycatch when required number of pingers used in NE (winter and fall) and in NJ (Jan-Apr)	Details about changes
Winter NE	306	306		68	Bycatch rate = 0.041 for all areas	68	Bycatch rate = 0.041 for all areas
Summer NE	52	52		52		52	
Fall NE	272	141	Midcoast closure bycrate = 0.041 (117->36) + Mass Bay closures bycrate = 0.041 (56->6)	95	Bycatch rate = 0.041 for all areas	95	Bycatch rate = 0.041 for all areas
NORTHEAST SUBTOTAL	630	499		215		215	
NJ MidAtlantic	470	152	Average compliant bycatch rate = 0.203	152	Average compliant bycatch rate = 0.203	31	Bycatch rate = 0.041 for all areas
GRAND TOTAL	1100	651		367		246	

Table 2. Predicted harbor porpoise bycatch from 2006 under different potential take reduction management actions

		Scenario I.		Scenario II.		Scenario III.	
Time/Area	2005 bycatch estimates	Bycatch when all hauls are in compliance under current TRP	Details about changes	Bycatch when required number of pingers used everywhere in NE (Winter and Fall)	Details about changes	Bycatch when required number of pingers used in NE (winter and fall) and in NJ (Jan-Apr)	Details about changes
Winter NE	420	369	Bycatch rate in S. Cape Closure = 0.023 (67->16)	123	Bycatch rate = 0.041 for all areas	123	Bycatch rate = 0.041 for all areas
Summer NE	37	37		37		37	
Fall NE	57	57		46	Bycatch rate = 0.041 for all areas	46	Bycatch rate = 0.041 for all areas
NORTHEAST SUBTOTAL	514	463		206		206	
NJ MidAtlantic	512	167	Average compliant bycatch rate = 0.203	167	Average compliant bycatch rate = 0.203	34	Bycatch rate = 0.041 for all areas
GRAND TOTAL	1026	630		373		240	

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.