



Northeast Fisheries Science Center Reference Document 09-05

**North Atlantic Right Whale Sighting Survey
(NARWSS)
and
Right Whale Sighting Advisory System
(RWSAS)**

2008 Results Summary

by Christin Khan, Timothy V.N. Cole, Peter Duley, Allison Glass,
Misty Niemeyer, and Cynthia Christman

Recent Issues in This Series

- 08-06 *North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2007 Results Summary*, by M Niemeyer, TVN Cole, CL Christman, P Duley, and AH Glass. April 2008.
- 08-07 *Northwest Atlantic Ocean Habitats Important to the Conservation of North Atlantic Right Whales (Eubalaena glacialis)*, by RM Pace III and RL Merrick. April 2008.
- 08-08 *Northeast Fisheries Science Center Publications, Reports, Abstracts, and Web Documents for Calendar Year 2007*, compiled by LS Garner. July 2008.
- 08-09 *Bycatch of Harbor Porpoises in Three U.S. Gillnet Management Areas: Southern Mid-Atlantic, Offshore, and Western Gulf of Maine*, by CD Orphanides and DL Palka. July 2008.
- 08-10 *Harbor Porpoise Bycatch Rates that Indicate Compliance with Pinger Regulations for the Northeast Gillnet Fishery*, by DL Palka and CD Orphanides. July 2008.
- 08-11 *47th SAW Assessment Summary Report*, by the 47th Northeast Regional Stock Assessment Workshop (47th SAW). July 2008.
- 08-12 *47th SAW (a) Assessment Report and (b) Appendixes*, by the 47th Northeast Regional Stock Assessment Workshop (47th SAW). July 2008.
- 08-13 *Predicted Harbor Porpoise Bycatch under Potential Mitigation Measure Scenarios*, by DL Palka and CD Orphanides. August 2008.
- 08-14 *Predicted Bycatch of Harbor Porpoises under Various Alternatives to Reduce Bycatch in the US Northeast and Mid-Atlantic Gillnet Fisheries*, by DL Palka and CD Orphanides. In press.
- 08-15 *Assessment of 19 Northeast Groundfish Stocks through 2007: A Report of the 3rd Groundfish Assessment Review Meeting (GARM III), Northeast Fisheries Science Center, Woods Hole, Massachusetts, August 4-8, 2008*, by Northeast Fisheries Science Center. August 2008.
- 08-16 *Assessment of 19 Northeast Groundfish Stocks through 2007: A Report of the 3rd Groundfish Assessment Review Meeting (GARM III) -- Appendixes*, by Northeast Fisheries Science Center. September 2008.
- 08-17 *Preparation of the Northeast Fisheries Observer Program Gillnet Data for Use in Bycatch Analyses of Protected Species*, by ML Warden and CD Orphanides. August 2008.
- 08-18 *A Description of the Allocation Procedure Applied to the 1994 to 2007 Commercial Landings data*, by SE Wigley, P Hersey, and JE Palmer. September 2008.
- 08-19 *11th Flatfish Biology Conference Program and Abstracts, Dec. 3-4, 2008, Water's Edge Resort and Spa, Westbrook, Connecticut*, by Conference Steering Committee: R Mercaldo-Allen (Chair), A Calabrese, D Danila, M Dixon, A Jearld, T Munroe, Deborah Pacileo, C Powell, and S Sutherland. November 2008.
- 08-20 *Estimated average annual bycatch of loggerhead sea turtles (Caretta caretta) in US Mid-Atlantic bottom otter trawl gear, 1996-2004 (2nd edition)*, by KT Murray. November 2008.
- 09-01 *Report of the Retrospective Working Group, January 14-16, 2008, Woods Hole, Massachusetts*, by CM Legault, Chair. January 2009.
- 09-02 *The Northeast Data Poor Stocks Working Group Report, December 8-12, 2008 Meeting*, by Northeast Data Poor Stocks Working Group. January 2009.
- 09-03 *The 2008 Assessment of the Gulf of Maine Atlantic Cod (Gadus morhua) Stock*, by RK Mayo, G Shepherd, L O'Brien, LA Col, and M. Traver. February 2009.
- 09-04 *Mortality and serious injury determinations for baleen whale stocks along the United States eastern seaboard and adjacent Canadian maritimes, 2003-2007*, by AH Glass, TVN Cole, and M Garron. March 2009.

North Atlantic Right Whale Sighting Survey (NARWSS)
and
Right Whale Sighting Advisory System (RWSAS)
2008 Results Summary

by Christin Khan¹, Timothy V.N. Cole², Peter Duley¹, Allison Glass¹,
Misty Niemeyer¹, and Cynthia Christman¹

¹Integrated Statistics
16 Sumner Street, Woods Hole, MA 02543

²Northeast Fisheries Science Center
166 Water Street, Woods Hole, MA 02543

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

March 2009

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 February 5, 2009; manuscript accepted through technical review February 5, 2009; manuscript accepted through policy review February 27, 2009; and final copy submitted for publication March 4, 2009. 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 February 5, 2009. The signed pre-dissemination review and documentation is on file at the NEFSC Editorial Office. This document may be cited as:

Khan C, Cole TVN, Duley P, Glass AH, Niemeyer M, Christman C. 2009. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2008 Results Summary. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-05; 7 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

North Atlantic Right Whale Sighting Surveys..... 1

Right Whale Sighting Advisory System..... 1

List of Tables

Table 1. Summary of NARWSS flights conducted in 2008 including the number of flights, flight hours, and right whales by both survey block and month..... 3

Table 2. The total number of right whale sightings reported to the RWSAS in 2008 by reporting source, the number of these reports which were unconfirmed, and the number of late reports (those received more than one day after the sighting)..... 3

List of Figures

Figure 1. The locations of the sawtooth survey blocks used by the North Atlantic Right Whale Sighting Survey (NARWSS) to monitor the seasonal distribution of right whales during 2008. 2

Figure 2a. NARWSS track lines and right whale sightings from January–March, 2008. 4

Figure 2b. NARWSS track lines and right whale sightings from April–June, 2008. 4

Figure 2c. NARWSS track lines and right whale sightings from July–September, 2008. 5

Figure 2d. NARWSS track lines and right whale sightings from October–December, 2008. 5

Figure 3. Number, month, and source of reported right whale sightings in 2008 within the (A) Northeast region- Maine through New York, (B) Mid-Atlantic region- New Jersey through North Carolina, and (C) Canadian waters. 6

Figure 4a. Locations of all right whale sightings reported to the RWSAS within the Northeast and Canada region in 2008, shown by reporting source..... 7

Figure 4b. Locations of all right whale sightings reported to the RWSAS within the Mid-Atlantic region in 2008, shown by reporting source..... 7

North Atlantic Right Whale Sighting Surveys

The North Atlantic Right Whale Sighting Survey (NARWSS) is a NOAA Fisheries program which locates and records the seasonal distribution of right whales off the northeastern United States. All NARWSS flights conducted in 2008 were sawtooth surveys and followed systematic track lines within nine survey blocks: Cashes Ledge, Franklin Basin, Georges Basin, Georges Shoal, Great South Channel, Howell Swell, Jeffreys Ledge, Jordan Basin, and Stellwagen Bank (Figure 1). There were no broadscale surveys conducted in 2008, as there have been in the past (Niemeier et al. 2008. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2007 results summary. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 08-06; 6 p.). During 2008, 53 flights that involved 295 flight hours were conducted in the nine survey blocks (Table 1). In addition, there were directed flights to relocate whale carcasses, entangled whales or support disentanglement efforts. During the 53 flights (not including the transits) 639 right whales were detected. The locations of the right whale sightings and transects flown by season are displayed in Figures 2a-2d.

Right Whale Sighting Advisory System

The Right Whale Sighting Advisory System (RWSAS) is designed to reduce collisions between ships and right whales by alerting mariners to the presence of the right whales via email, the internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR) (<http://www.nmfs.noaa.gov/pr/shipstrike/msr/>). There were 687 reports during 2008, of which 14 were unconfirmed and 54 were late (Table 2). These reports were obtained from a variety of sources including the NARWSS, whale research organizations, automated acoustic buoys, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The most common sources of the reports were acoustic buoys (211 or 31%) and aerial surveys (181 or 26%) (Table 2). Most of the reported right whale sightings in 2008 were within the Northeast region, which is from Maine through New York, where the number of reports per month varied from 24 in September to 137 in April (Figures 3 and 4a). Most of the reports of right whale sightings in the Mid-Atlantic region, which is from New Jersey through North Carolina, were from opportunistic sources, which is defined here as reports made by the general public, the Coast Guard, commercial ships and fishing vessels (Figures 3 and 4b). Most of the reported right whales in Canadian waters were from either shipboard or aerial surveys (Figures 3 and 4a).

A total of 257 alerts were broadcast in 2008. Unconfirmed reports, duplicate reports, and late reports of one to two right whales did not generate an alert. Late reports of two or more whales did generate an alert since it was likely that right whales remained in the vicinity of the reported location. Multiple sightings received on the same day were typically combined into a single alert.

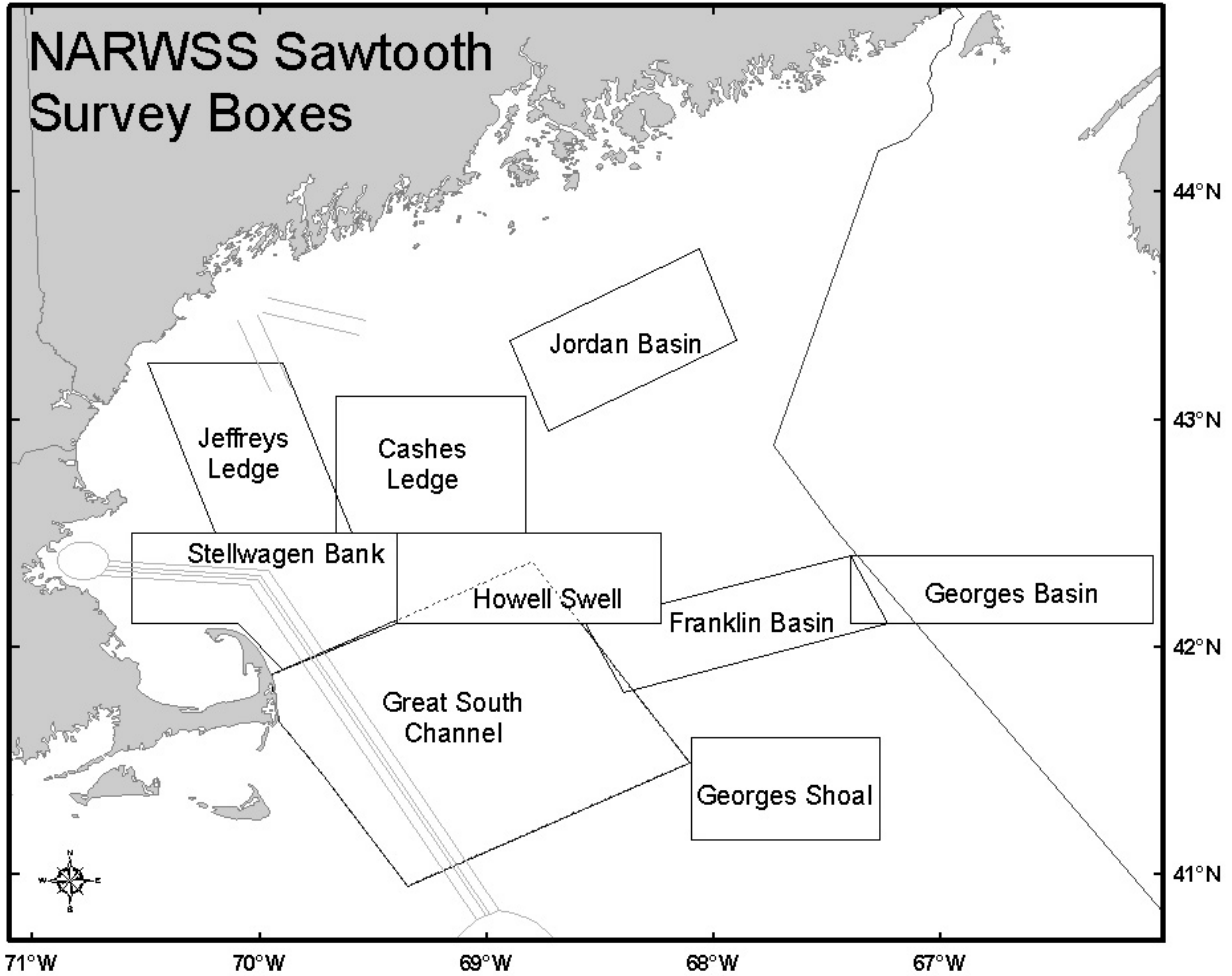


Figure 1. The locations of the sawtooth survey blocks used by the North Atlantic Right Whale Sighting Survey (NARWSS) to monitor the seasonal distribution of right whales during 2008.

Table 1. Summary of NARWSS flights conducted in 2008 including the number of flights, flight hours, and right whales by both survey block and month. All flights conducted were sawtooth surveys and followed systematic track lines within nine survey blocks. Directed flights to relocate whale carcasses, entangled whales or support of disentanglement efforts are not included in this table.

Total Number of Flights in Each Survey Block												
Month	Cashes Ledge	Franklin Basin	Georges Basin	Georges Shoal	Great South Channel	Howell Swell	Jeffreys Ledge	Jordan Basin	Stellwagen Bank	Number Flights	Flight hours ¹	#Egs ²
Jan							2	1	2	5	29.5	47
Feb	2						2	1		5	28.5	31
Mar				1	2				1	4	23.0	40
Apr	1	1			3	1	1	1	1	9	50.0	70
May					3					3	17.8	111
Jun		2			3	1				6	31.8	106
Jul		2	3		2				1	8	38.3	87
Aug										0	0.0	0
Sept										0	0.0	0
Oct	1						2	1	1	5	27.4	11
Nov	1						1	2	1	5	28.8	48
Dec	1							2		3	19.4	88
Totals	6	5	3	1	13	2	8	8	7	53	295	639
# Egs²	31	89	34	0	264	6	30	160	25			

¹ Flight hours includes transit time in addition to time on survey and while circling to photograph whales

² # Egs = number of right whales sighted (may include duplicate individuals and does not include whales seen on transit)

Table 2. The total number of right whale sightings reported to the RWSAS in 2008 by reporting source, the number of these reports which were unconfirmed, and the number of late reports (those received more than one day after the sighting).

	# of Reports	Unconfirmed	Late
Aerial Survey	181	0	16
Shipboard Survey	55	0	15
Acoustic ¹	211	0	7
Whale Watch	59	0	2
Coast Guard	14	1	0
Commercial Ship	10	3	1
Fishing Vessel	2	0	0
Opportunistic	89	10	13
Totals	687	14	54

¹ For acoustic buoys, a report is considered a day in which one or more acoustic buoys detected right whale vocalizations.

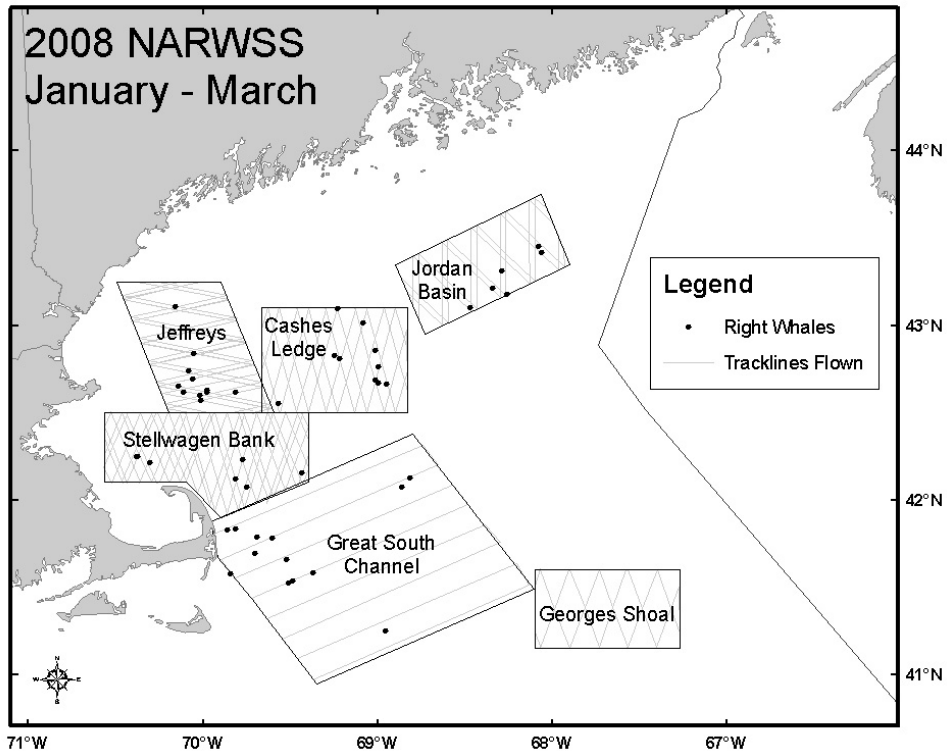


Figure 2a. NARWSS track lines and right whale sightings from January through March, 2008.

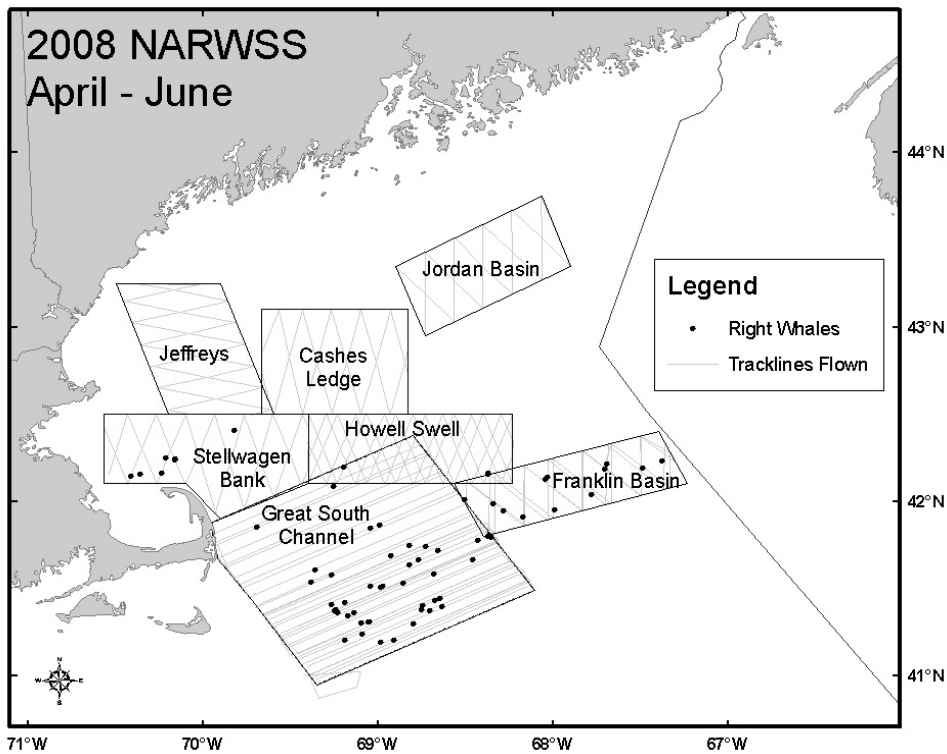


Figure 2b. NARWSS track lines and right whale sightings from April through June, 2008.

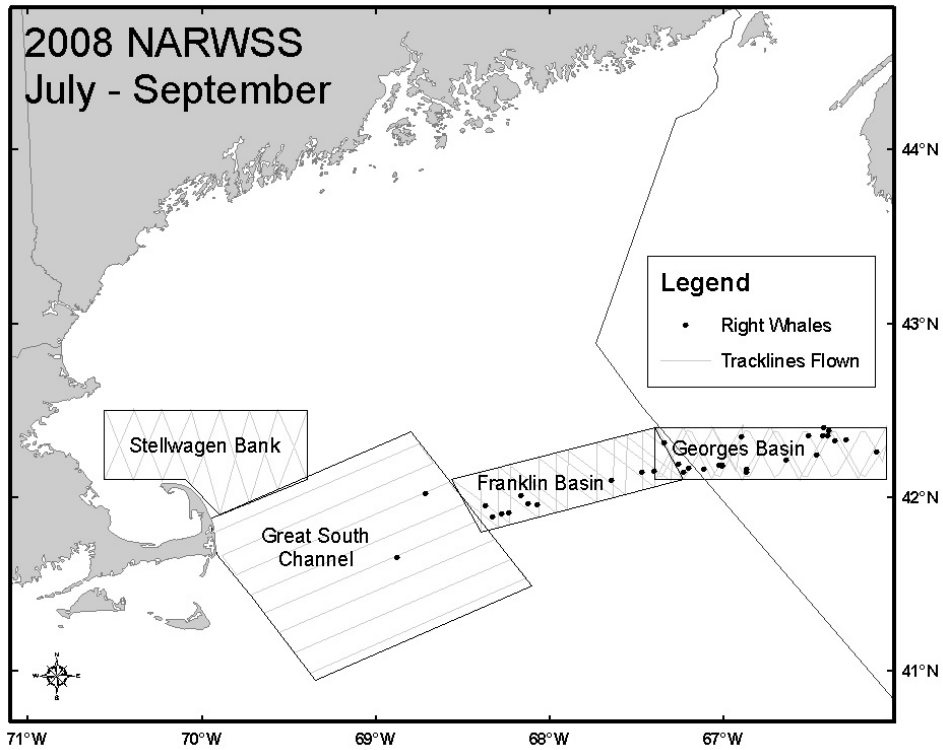


Figure 2c. NARWSS track lines and right whale sightings from July through September, 2008.

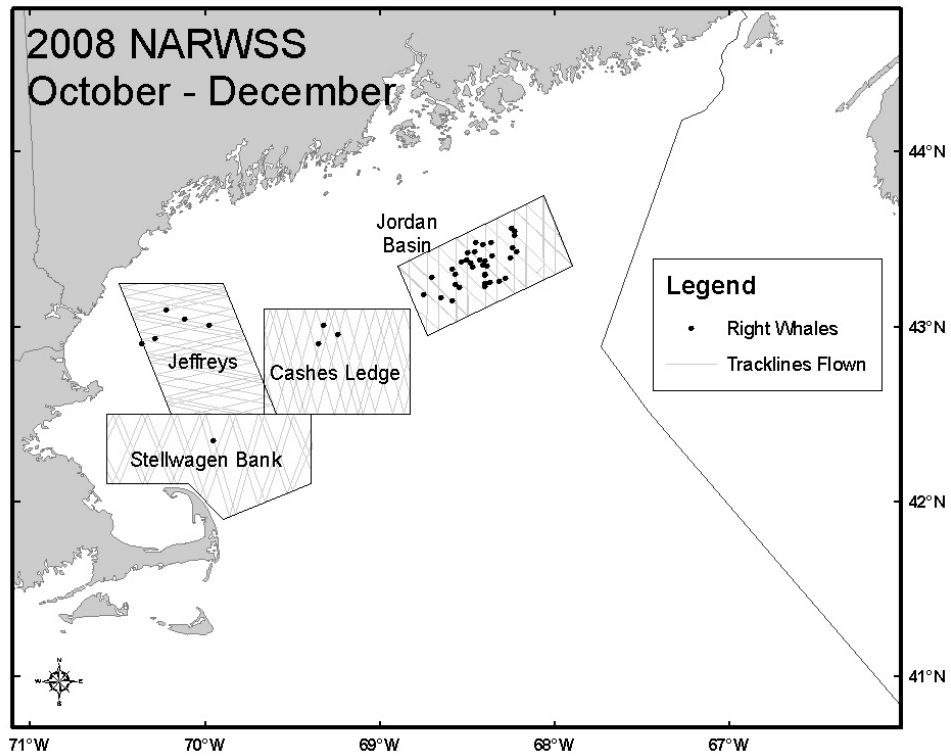


Figure 2d. NARWSS track lines and right whale sightings from October through December, 2008.

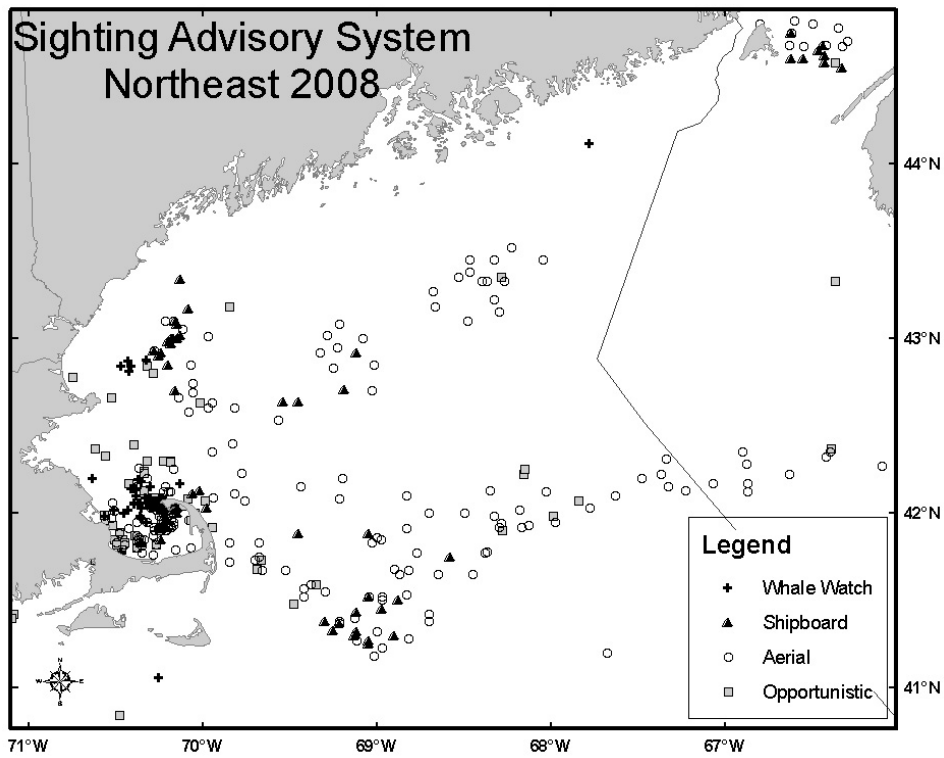


Figure 4a. Locations of all right whale sightings reported to the RWSAS within the Northeast and Canada region in 2008, shown by reporting source. The category 'Opportunistic' includes reports made by the general public, the Coast Guard, commercial ships, and fishing vessels. Unconfirmed reports were excluded from this figure.

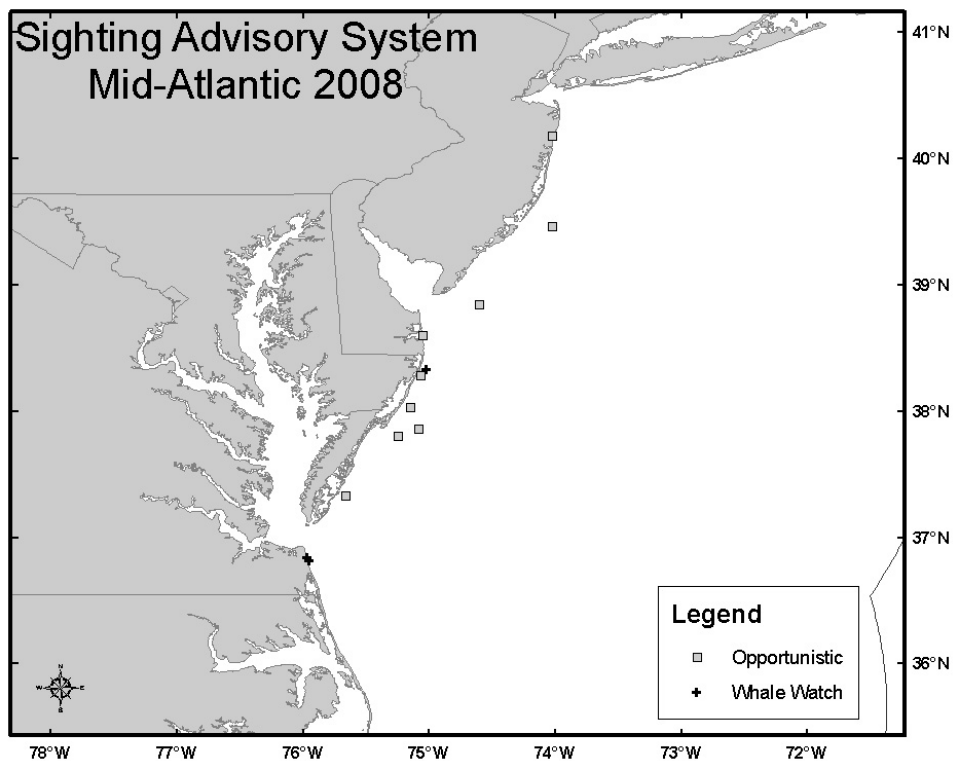


Figure 4b. Locations of all right whale sightings reported to the RWSAS within the Mid-Atlantic region in 2008, shown by reporting source. The category 'Opportunistic' includes reports made by the general public, the Coast Guard, commercial ships, and fishing vessels. Unconfirmed reports were excluded from this figure.

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.

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.
