Northeast Fisheries Science Center Reference Document
07-18a, 07-18b, 07-18c, 07-18d, & 07-18e

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

Part A: 2002 Results Summary (CRD 07-18a)
Part B: 2003 Results Summary (CRD 07-18b)
Part C: 2004 Results Summary (CRD 07-18c)
Part D: 2005 Results Summary (CRD 07-18d)
Part E: 2006 Results Summary (CRD 07-18e)

compiled by Misty Niemeyer

contributing authors (alphabetical by last name):
Timothy V.N. Cole, Cynthia L. Christman, Peter Duley,
Allison Glass, Kelly Houle, Misty Nelson, Misty Niemeyer,
Liz Pomfret, Brenda K. Rone, & Alison Stimpert

October 2007

Northeast Fisheries Science Center Reference Document 07-18a

North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2002 Results Summary

by Timothy V.N. Cole, Alison Stimpert, Liz Pomfret,
Kelly Houle, and Misty Niemeyer

National Marine Fisheries Serv, Woods Hole Lab, 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

October 2007

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 volume is part of a larger document containing five separate results summaries for five separate years. There is no analysis across the years included in this volume. This is the first publication of the collected data; future reports will be published annually in separate volumes.

This document's publication history is as follows: manuscript submitted for review October 10, 2007; manuscript accepted through technical review October 10, 2007; manuscript accepted through policy review October 10, 2007; and final copy submitted for publication October 10, 2007. This document may be cited as:

Cole TVN, Stimpert A, Pomfret L, Houle K, Niemeyer M. 2007. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2002 results summary. US Dept Commer, *Northeast Fish Sci Cent Ref Doc*. 07-18a; 6 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents (Volume A)

A. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2002 Results Summary..... A-1

Tables

Table 1. Summary of the flight hours and flight types for 2002 NARWSS flights..... A-2
Table 2. Total sightings reported to the RWSAS in 2002 ..... A-5

Figures

Figure 1. Completed track lines and right whale sighting locations for 2002 NARWSS flights separated by season..... A-3
Figure 2. Synopsis of the systematic broadscale surveys conducted for the NARWSS in 2002, showing the resulting Sightings Per Unit Effort (SPUE) analysis..... A-4
Figure 3. Sightings reported to the RWSAS in 2002 by source, month and region..... A-5
Figure 4. Map of Sightings reported to the RWSAS in 2002 in the Northeast region and Canadian waters..... A-6

A. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2002 Results Summary

By Timothy V.N. Cole, Alison Stimpert, Liz Pomfret and Kelly Houle

Overview – 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. 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 fax, email, the Internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). These reports are obtained from a variety of sources including the NARWSS, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The results from both the NARWSS and the RWSAS programs in 2002 are summarized in the following tables and figures.

Table 1 – This table provides information on: (a) the total number of the NARWSS flight hours accomplished in each month during 2002; (b) the number of the NARWSS flights conducted in each month, by survey type; and (c) the total number of right whales sighted on all the NARWSS flights during each month in 2002. There were three primary types of surveys flown: (1) broadscale; (2) focused surveys in the Great South Channel (GSC) region; and (3) focused surveys over potential and realized Dynamic Area Management (DAM) closure zones. Broadscale surveys were flown along systematic east-west track lines that covered all Federal waters west of the Hague Line, from south of Long Island, New York, to Eastport, Maine. These surveys were flown to obtain a synoptic view of the distribution of right whales off the northeastern Atlantic coast; a completed series indicates coverage of the entire area. Surveys focused in the GSC served the dual purpose of providing commercial shipping traffic with the current locations of right whale aggregations, and obtaining photographic data of individual right whales for use in vital rate models of the population. DAM confirmation flights included flights made to investigate reported sightings of right whale aggregations outside existing closures, as well as to monitor the duration of residence of aggregations within established DAM zones.

Figure 1 – This figure shows, by season, all the NARWSS survey track lines and right whale sighting locations in 2002. Seasonal right whale closure areas in effect during each period are shown as heavy bold lines. Closure areas in effect for only a portion of the period are represented by medium bold lines. The duration of each closure area is as follows: Cape Cod Bay: Jan 1 - May 15; Great South Channel: April 1 - June 30; Seasonal Area Management (SAM) West: March 1 - April 30; Seasonal Area Management (SAM) East: May 1 - July 31.

Figure 2 – Presents a synopsis of the systematic broadscale surveys conducted during both the spring and fall of 2002. The data were grouped by ten-minute latitude by ten-minute longitude geographic cells. Effort levels within each cell were ranked according to the nautical miles of surveys completed within them, excluding circling. Cells with higher effort levels were shaded more darkly, while areas with no effort were left blank. To make sighting levels between cells with different effort levels comparable, the number of right whales sighted within a cell was divided by the nautical miles of survey completed in the same cell. The resulting Sighting Per Unit Effort (SPUE) within each cell was then ranked, with higher SPUE levels indicated by

darker shading. Seasonal right whale closure areas in effect during each period are shown as heavy bold lines. Closure areas in effect for only a portion of the period are represented by medium bold lines.

Table 2 – This table lists the number of right whale sightings reported to the RWSAS in 2002, by reporting source, and indicates the number of unconfirmed and late reports by source. Unconfirmed and late reports did not produce an alert. Often sightings were combined into a single alert. A total of 110 alerts were broadcast in 2002.

Figure 3a – This figure depicts the total number of right whale sightings reported to the RWSAS in 2002, by month and source, in the Northeast (*i.e.,* from Maine through New York) and Canada region.

Figure 3b – This figure depicts the total number of right whale sightings reported to the RWSAS in 2002, by month and source, in the Mid-Atlantic region (*i.e.,* from New Jersey through North Carolina).

Figure 4 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2002 in the Northeast and Canada region (including unconfirmed and late reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. Shipping lanes, the Hague Line and the Cape Cod Bay and Great South Channel Critical Habitat areas are included for reference, as are the 50-fathom and 100-fathom depth contours.

Table 1. Summary of the flight hours and flight types for 2002 NARWSS flights

Month in 2002	Flight hours	# Flights *			Broadscale series completed	GSC surveys completed	DAM confirmation flights
		broadscale	*focused*	*other*			
March	35	2	3	2			1
April	92	10	7		1	1	3
May	89	9	8	1	1	3	3
June	141	15	11	1	2	4	
July	36	4	4			3	1
August	0						
September	47	9			1		
October	44	7	1		1		
November	25	2	3			1	1
December	18	1	3				3
totals	**527**	**59**	**40**	**4**	**6**	**12**	**12**

* Flights that had both broadscale and focused survey time were counted as broadscale flights.
Of the focused flights, 17 were strictly 'management' flights totaling 82 hours; these included DAM confirmations, disentanglement support, and carcass checks. Other flights included ferrying flights, telemetry testing, and a Congressional review flight.

Figure 1. Completed track lines and right whale sighting locations for 2002 NARWSS flights separated by season. Thin lines represent track lines and bull's-eyes represent right whale sighting locations.

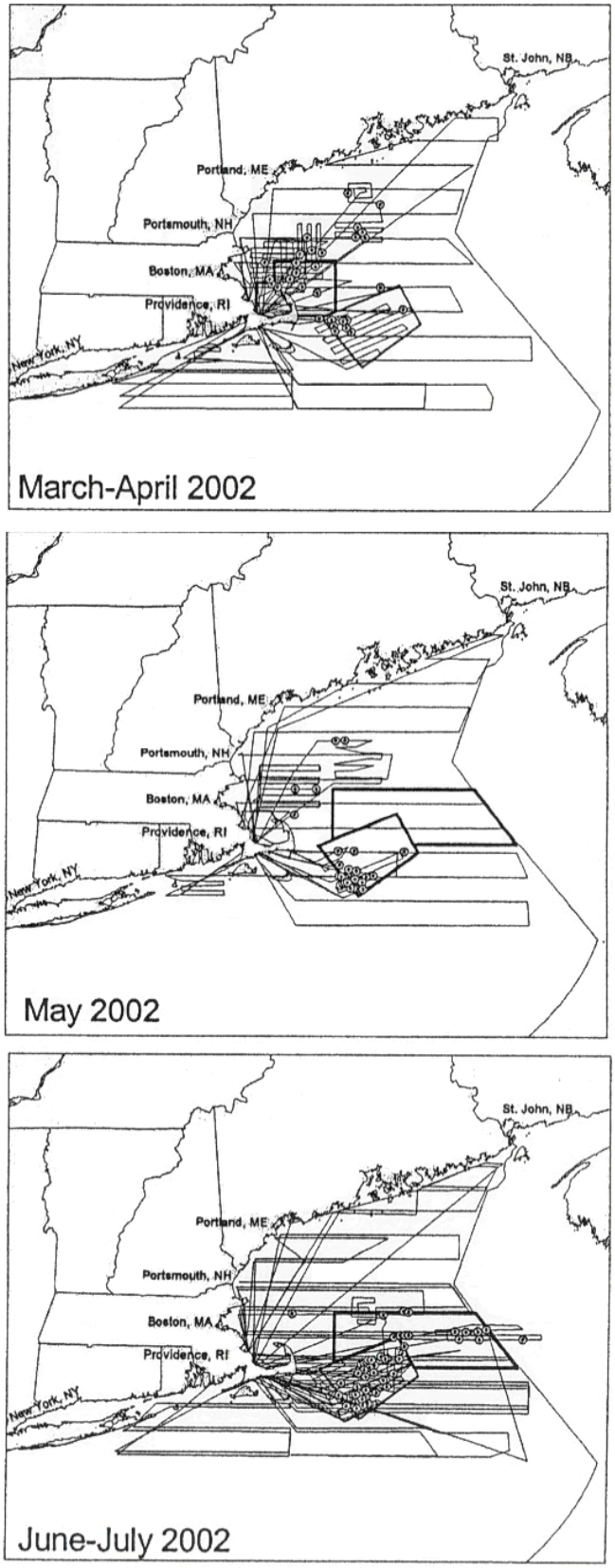


Figure 2. Synopsis of the systematic broadscale surveys conducted for the NARWSS in 2002, showing the resulting Sightings Per Unit Effort (SPUE) analysis

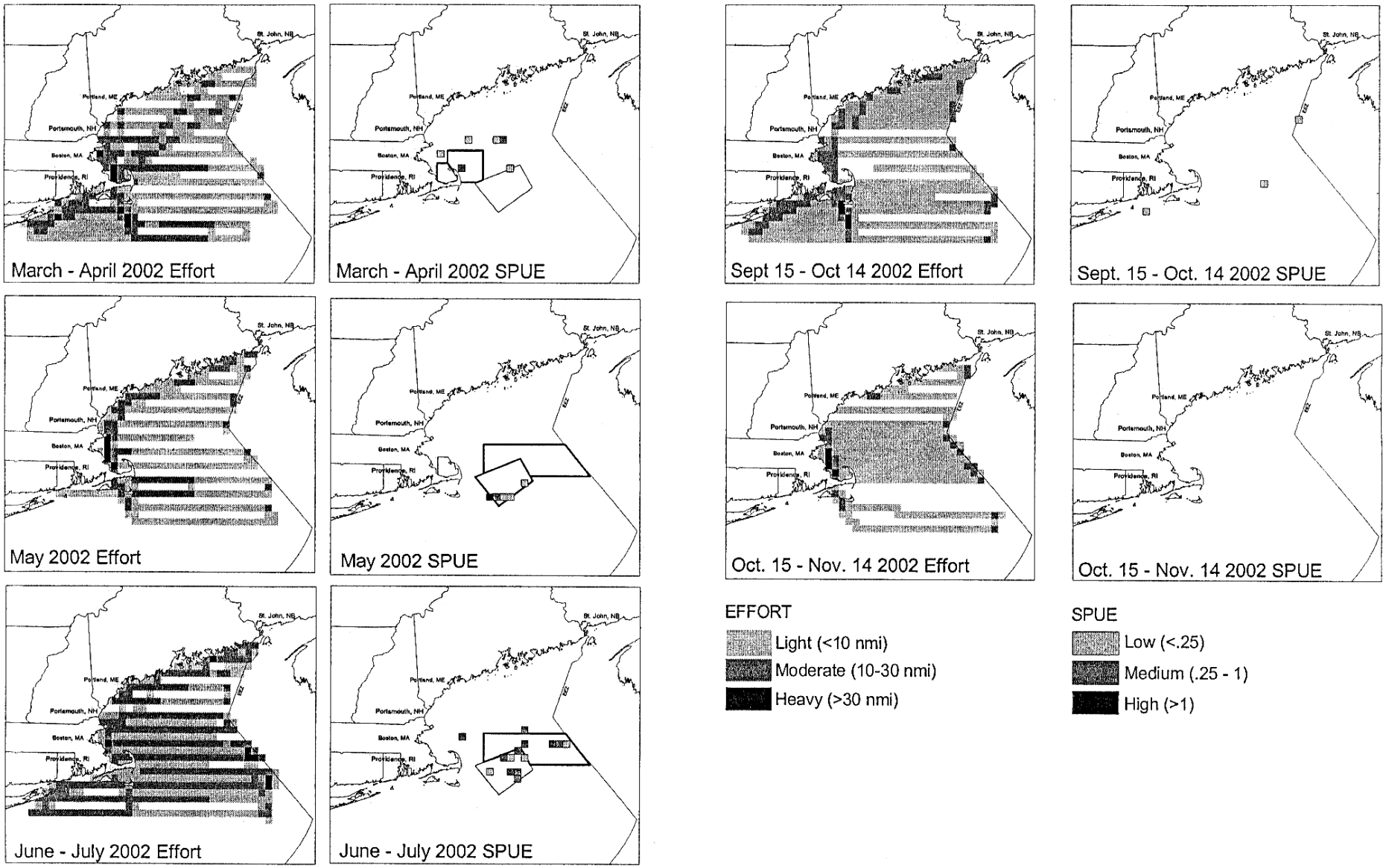


Table 2. Total sightings reported to the RWSAS in 2002

Report source	# Reports	Unconfirmed	Late
Aerial survey	145		
Shipboard survey	34		1
Whale Watch	21		2
Opportunistic	31	3	5
Coast Guard	7		
Commercial Ship	6	4	1
Fishing Vessel	1		
totals	**245**	**7**	**9**

Figure 3. Sightings reported to the RWSAS in 2002 by source, month and region

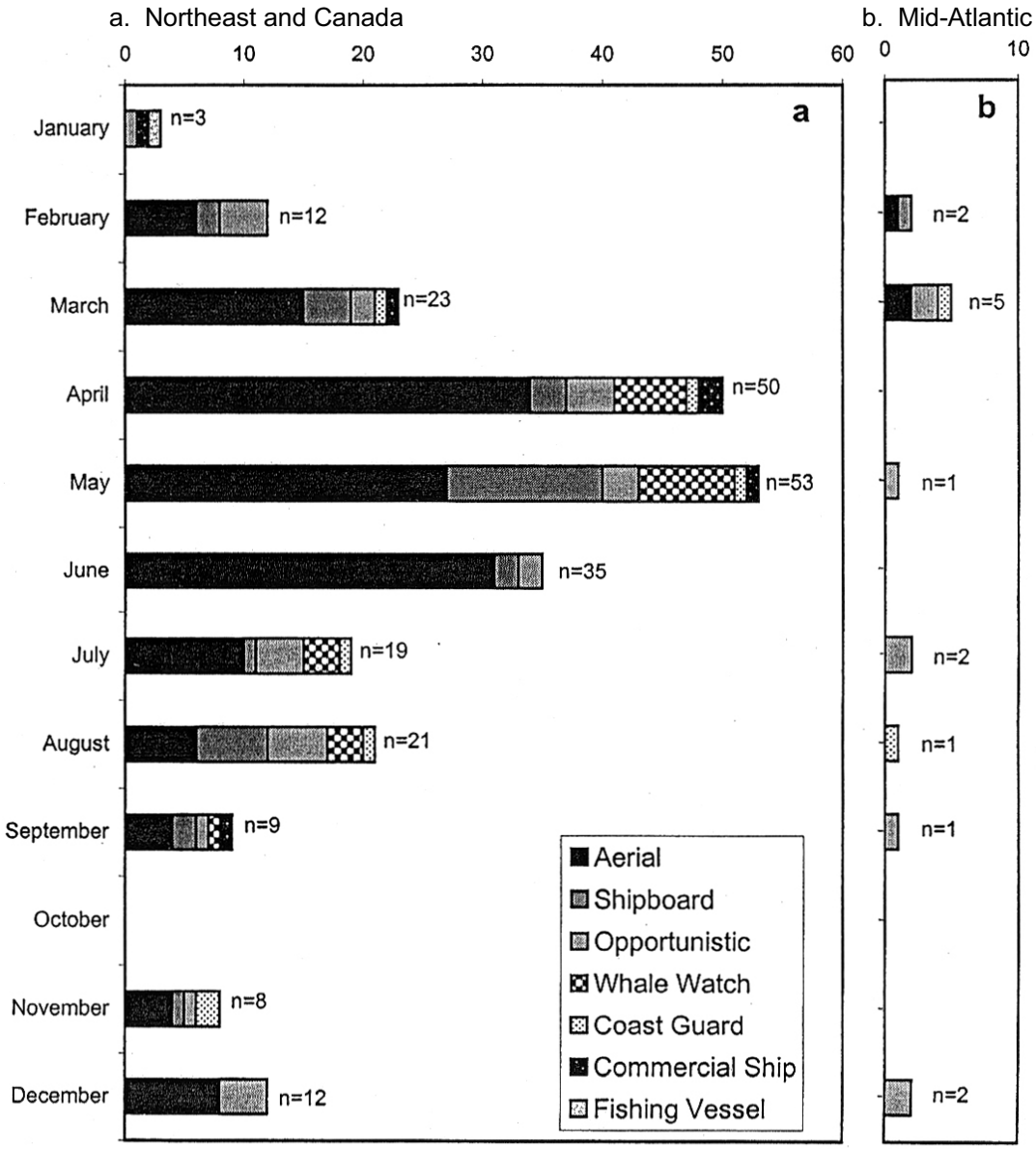
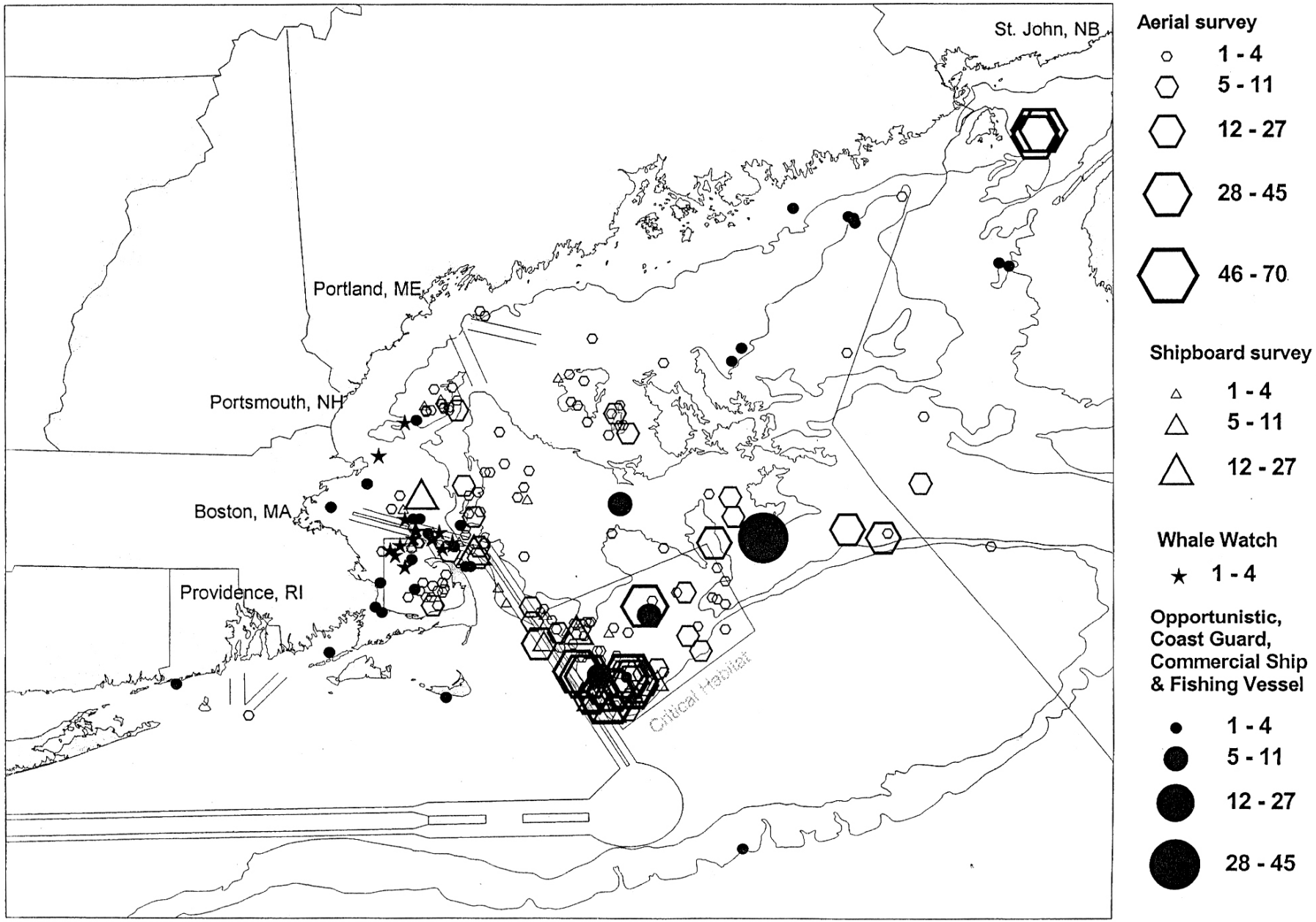


Figure 4. Map of Sightings reported to the RWSAS in 2002 in the Northeast region and Canadian waters



Northeast Fisheries Science Center Reference Document 07-18b

North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2003 Results Summary

by Brenda K. Rone, Timothy V.N. Cole, Peter Duley,
Misty Nelson, & Misty Niemeyer

National Marine Fisheries Serv, Woods Hole Lab, 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

October 2007

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 volume is part of a larger document containing five separate results summaries for five separate years. There is no analysis across the years included in this volume. This is the first publication of the collected data; future reports will be published annually in separate volumes.

This document's publication history is as follows: manuscript submitted for review September 28, 2007; manuscript accepted through technical review September 28, 2007; manuscript accepted through policy review October 10, 2007; and final copy submitted for publication October 10, 2007. This document may be cited as:

Rone BK, Cole TV, Duley P, Nelson M, Niemeyer M. 2007. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2003 results summary. US Dept Commer, *Northeast Fish Sci Cent Ref Doc*. 07-18b; 5 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents (Volume B)

B. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2003 Results Summary..... B-1

Tables

Table 1. Summary of the flight hours and flight types for 2003 NARWSS flights..... B-2
Table 2. Total sightings reported to the RWSAS in 2003 ..... B-4

Figures

Figure 1. Completed track lines and right whale sighting locations for 2003 NARWSS flights, separated by season..... B-3
Figure 2. Sightings reported to the RWSAS in 2003 by source, month and region B-4
Figure 3. Map of sightings reported to the RWSAS in 2003 in the Northeast region and Canadian waters B-5

B. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2003 Results Summary

by Brenda K. Rone, Timothy V.N. Cole, Peter Duley and Misty Nelson

Overview – 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. 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 fax, email, the Internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). These reports are obtained from a variety of sources including the NARWSS, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The results from both the NARWSS and the RWSAS programs in 2003 are summarized in the following tables and figures.

Table 1 – This table provides information on: (a) the total number of the NARWSS flight hours accomplished in each month during 2003; (b) the number of the NARWSS flights conducted in each month, by survey type; and (c) the total number of right whales sighted on all the NARWSS flights during each month in 2003. There were three primary types of surveys flown: (1) broadscale; (2) focused surveys in the Great South Channel (GSC) region; and (3) focused surveys over potential and realized Dynamic Area Management (DAM) closure zones. Broadscale surveys were flown along systematic east-west track lines that covered all Federal waters west of the Hague Line, from south of Long Island, New York, to Eastport, Maine. These surveys were flown to obtain a synoptic view of the distribution of right whales off the northeastern Atlantic coast; a completed series indicates coverage of the entire area. Surveys focused in the GSC served the dual purpose of providing commercial shipping traffic with the current locations of right whale aggregations, and obtaining photographic data of individual right whales for use in vital rate models of the population. DAM confirmation flights included flights made to investigate reported sightings of right whale aggregations outside existing closures, as well as to monitor the duration of residence of aggregations within established DAM zones.

Figure 1 – This figure shows, by season, all the NARWSS survey track lines and right whale sighting locations in 2003. Seasonal right whale closure areas in effect during each period are shown as bold lines. The duration of each closure area is as follows: Cape Cod Bay: Jan 1 - May 15; Great South Channel: April 1 - June 30; Seasonal Area Management (SAM) West: March 1 - April 30; Seasonal Area Management (SAM) East: May 1 - July 31.

Table 2 – This table lists the number of right whale sightings reported to the RWSAS in 2003, by reporting source, and indicates the number of unconfirmed and late reports by source. Unconfirmed reports did not produce an alert. Late reports generated an alert when it was likely that the reported location would continue to be occupied by right whales. Often sightings were combined into a single alert. A total of 134 alerts were broadcast to mariners in 2003.

Figure 2a – This figure depicts the total number of right whale sightings reported to the RWSAS in 2003, by month and source, in the Northeast (*i.e.,* from Maine through New York) and Canada region.

Figure 2b – This figure depicts the total number of right whale sightings reported to the RWSAS in 2003, by month and source, in the Mid-Atlantic region (*i.e.,* from New Jersey through North Carolina).

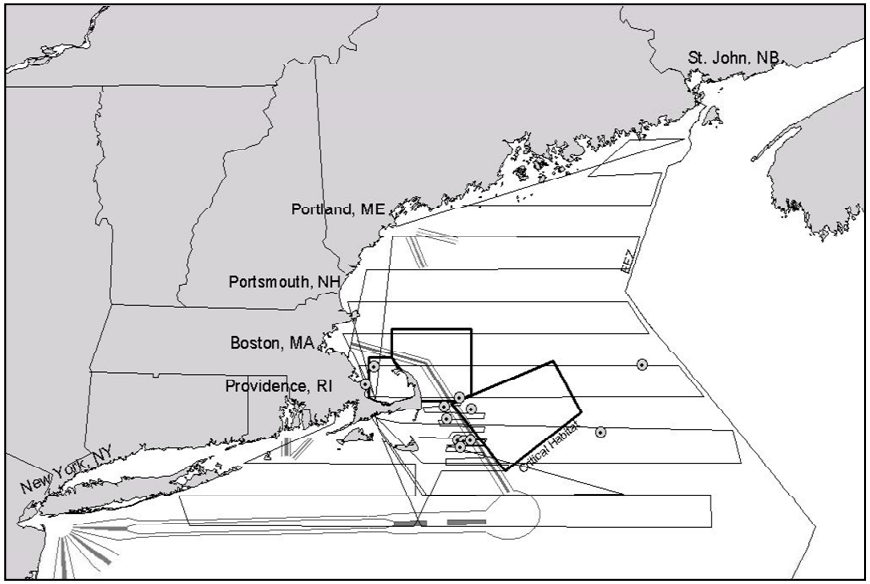
Figure 3 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2003 in the Northeast and Canada region (excluding unconfirmed reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. Shipping lanes, the Hague Line and the Cape Cod Bay and Great South Channel Critical Habitat areas are included for reference.

Table 1. Summary of the flight hours and flight types for 2003 NARWSS flights

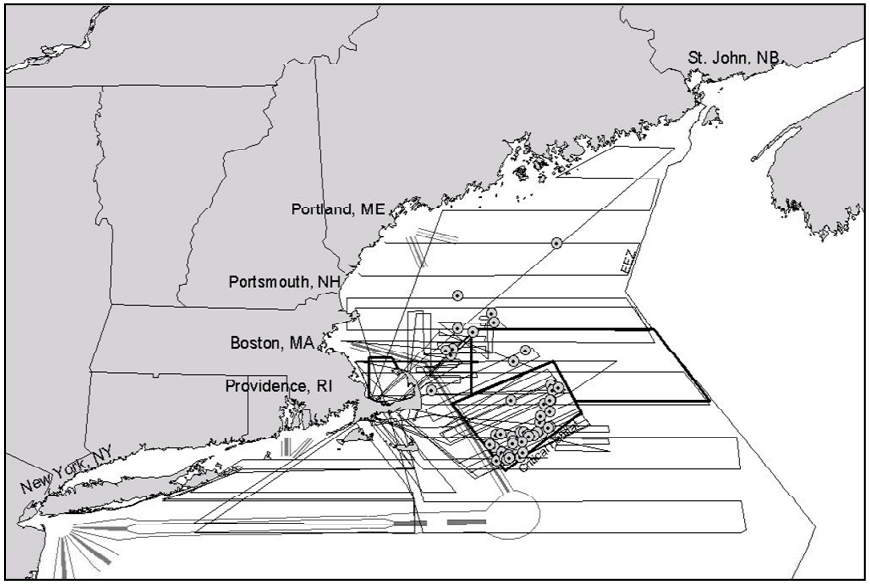
Month in 2003	Flight hours	# Flights*			Broadscale series completed	GSC surveys completed	DAM confirmation flights
		broadscale	***focused***	***other***			
April	43	7	2	1	1	1	0
May	111	15	6	1	1	4	1
June	118	17	6	0	1	4	2
July	59	7	5	0	1	0	3
August	42	0	10	0	0	0	0
September	26	5	1	0	0	0	0
October	59	11	0	1	1	0	0
November	24	2	3	0	1	0	0
December	3	0	1	0	0	0	1
Totals	**485**	**64**	**34**	**3**	**6**	**9**	**7**

*Flights that had both broadscale and focused survey time were counted as broadscale flights. Of the focused flights, 13 were strictly 'management' flights totaling 45 hours; these included DAM confirmations, disentanglement support, and carcass checks. Other flights included salmon pen photography, an oil spill flight, and a seal survey. The month of August was a dedicated photogrammetry project in the Bay of Fundy.

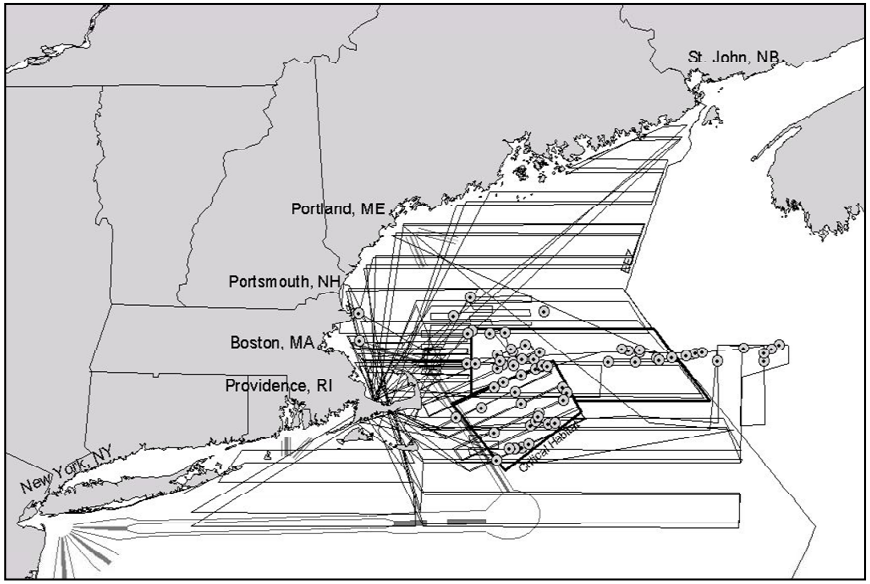
Figure 1. Completed track lines and right whale sighting locations for 2003 NARWSS flights, separated by season. Thin lines represent track lines and bull's eyes represent right whale sighting locations.



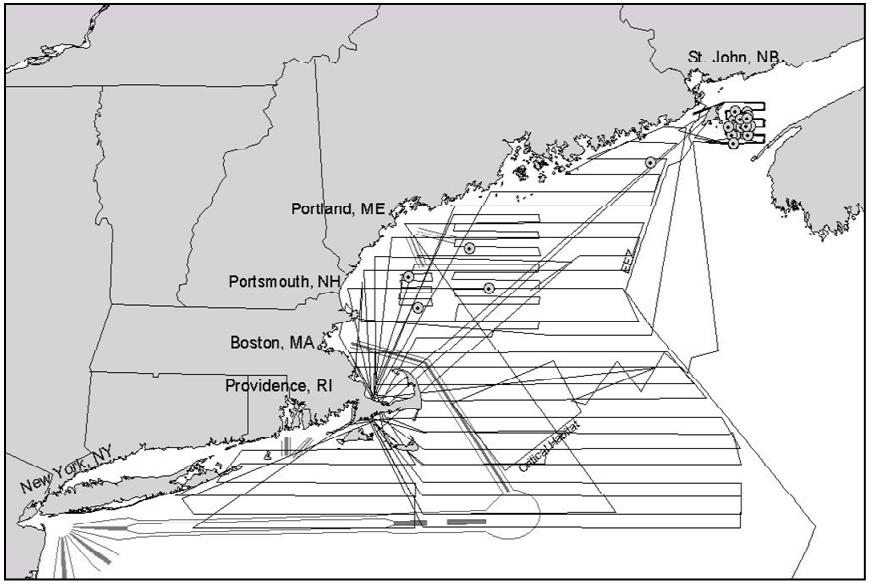
April 2003



May 2003



June – July 2003



August – December 2003

Table 2. Total sightings reported to the RWSAS in 2003

Source	# of Reports	Unconfirmed	Late
Aerial Survey	131	0	1
Shipboard Survey	42	0	6
Whale Watch	91	0	4
Opportunistic	52	7	7
Coast Guard	22	2	3
Commercial Ship	3	0	0
Fishing Vessel	4	1	3
Totals	**345**	**10**	**24**

Figure 2. Sightings reported to the RWSAS in 2003 by source, month and region

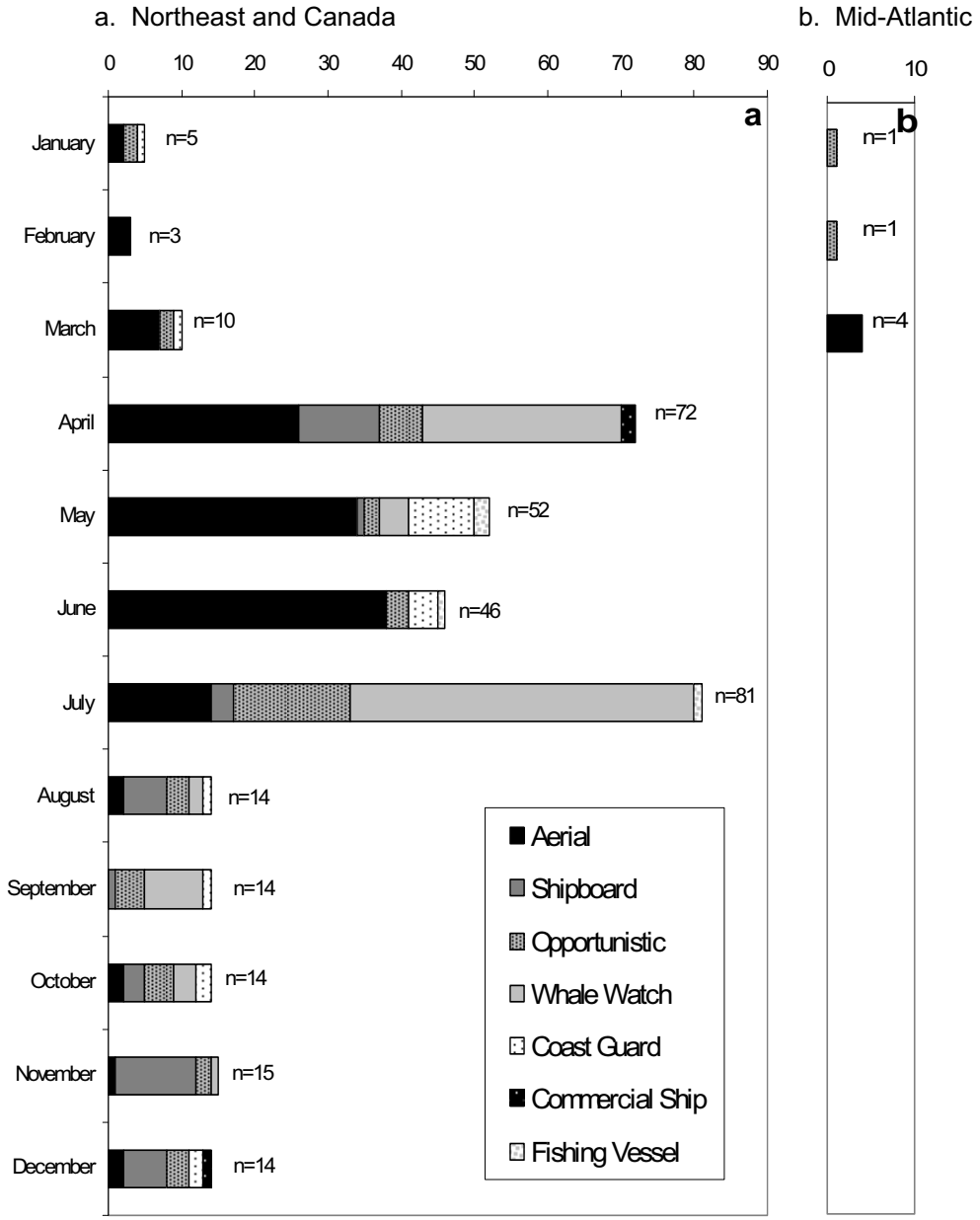
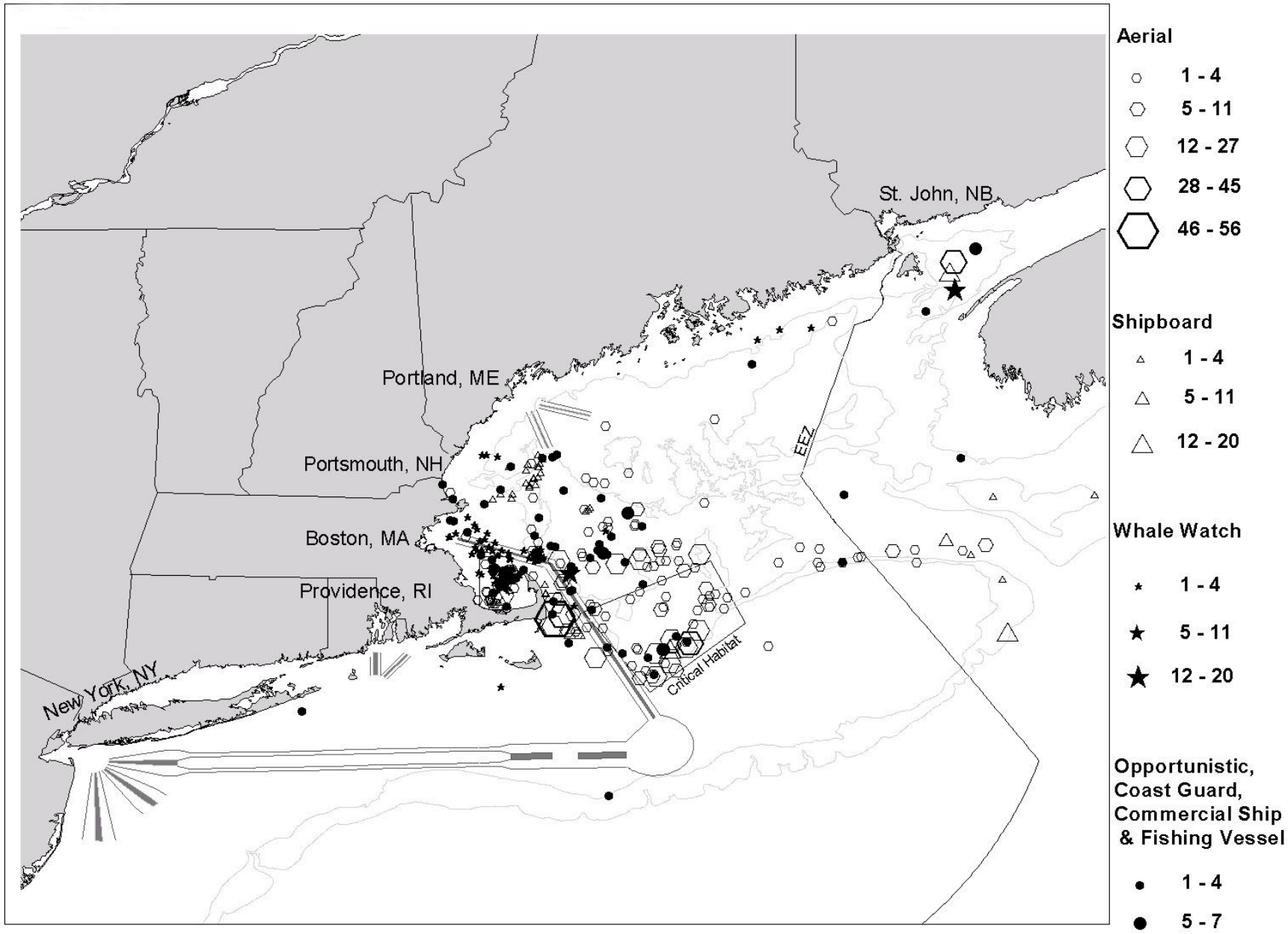


Figure 3. Map of sightings reported to the RWSAS in 2003 in the Northeast region and Canadian waters



Northeast Fisheries Science Center Reference Document 07-18c

North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2004 Results Summary

by Brenda K. Rone, Timothy V.N. Cole, Peter Duley,
Misty Nelson, & Misty Niemeyer

National Marine Fisheries Serv, Woods Hole Lab, 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

October 2007

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 volume is part of a larger document containing five separate results summaries for five separate years. There is no analysis across the years included in this volume. This is the first publication of the collected data; future reports will be published annually in separate volumes.

This document's publication history is as follows: manuscript submitted for review September 27, 2007; manuscript accepted through technical review September 30, 2007; manuscript accepted through policy review October 10, 2007; and final copy submitted for publication October 10, 2007. This document may be cited as:

Rone BK, Cole TVN, Duley P, Nelson M, Niemeyer M. 2007. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2004 results summary. US Dept Commer, *Northeast Fish Sci Cent Ref Doc*. 07-18c; 5 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents (Volume C)

C. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2004 Results Summary..... C-1

Tables

Table 1. Summary of the flight hours, flight types, and number of right whales seen during 2004 NARWSS flights..... C-2
Table 2. Total sightings reported to the RWSAS in 2004 ..... C-4

Figures

Figure 1. Completed track lines and right whale sighting locations for 2004 NARWSS flights, separated by season..... C-3
Figure 2. Sightings reported to the RWSAS in 2004 by source, month and region C-4
Figure 3. Map of sightings reported to the RWSAS in 2004 in the Northeast region and Canadian waters C-5

C. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2004 Results Summary

by Brenda K. Rone, Timothy V.N. Cole, Peter Duley, Misty Nelson, and Misty Niemeyer

Overview – 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. 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 fax, email, the Internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). These reports are obtained from a variety of sources including the NARWSS, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The results from both the NARWSS and the RWSAS programs in 2004 are summarized in the following tables and figures.

Table 1 – This table provides information on: (a) the total number of the NARWSS flight hours accomplished in each month during 2004; (b) the number of the NARWSS flights conducted in each month by survey type; and (c) the total number of right whales sighted on all the NARWSS flights during each month in 2004. There were four primary types of surveys flown: (1) broadscale; (2) focused surveys in the Great South Channel (GSC) Critical Habitat; (3) focused surveys over potential and realized Dynamic Area Management (DAM) closure zones; and (4) focused surveys in a designated Navy bombing range referred to as W-104B. Broadscale surveys were flown along systematic east-west track lines that covered all Federal waters west of the Hague Line from south of Long Island, New York, to Eastport, Maine. These surveys were flown to provide a synoptic view of the distribution of right whales off the northeastern Atlantic coast; a completed series indicates coverage of the entire area. Surveys focused in the GSC served the dual purpose of providing commercial shipping traffic with the current locations of right whale aggregations, and obtaining photographic data of individual right whales for use in vital rate models of the population. DAM confirmation flights included flights made to investigate reported sightings of right whale aggregations outside existing closures, as well as monitor the duration of residence of aggregations within established DAM zones. Focused surveys in W-104B were conducted by the NARWSS in cooperation with the Navy prior to scheduled bombing exercises to determine the presence or absence of marine mammals and sea turtles. Additional focused flights not categorized in the table were flights to relocate reported whale carcasses or to confirm reported right whale sightings in Nantucket Sound and New York Harbor.

Figure 1 – This figure shows, by season, all the NARWSS survey track lines and right whale sighting locations for 2004. Seasonal right whale closure areas in effect during each period are shown as bold lines. The duration for each closure area is as follows: Cape Cod Bay: Jan 1 - May 15; Great South Channel: April 1 - June 30; Seasonal Area Management (SAM) West: March 1 - April 30; Seasonal Area Management (SAM) East: May 1 - July 31.

Table 2 – This table lists the number of right whale sightings reported to the RWSAS in 2004, by reporting source, and indicates the number of unconfirmed and late reports by source.

Unconfirmed reports did not produce an alert. Late reports generated an alert if it was likely the location would continue to be occupied by right whales. Often sightings were combined into a single alert. A total of 113 alerts were broadcast in 2004.

Figure 2a – This figure depicts the total number of right whale sightings reported to the RWSAS in 2004, by month and source, in the Northeast (i.e., from Maine through New York) and Canada region.

Figure 2b – This figure depicts the total number of right whale sightings reported to the RWSAS in 2004, by month and source, in the Mid-Atlantic region (i.e., from New Jersey through North Carolina).

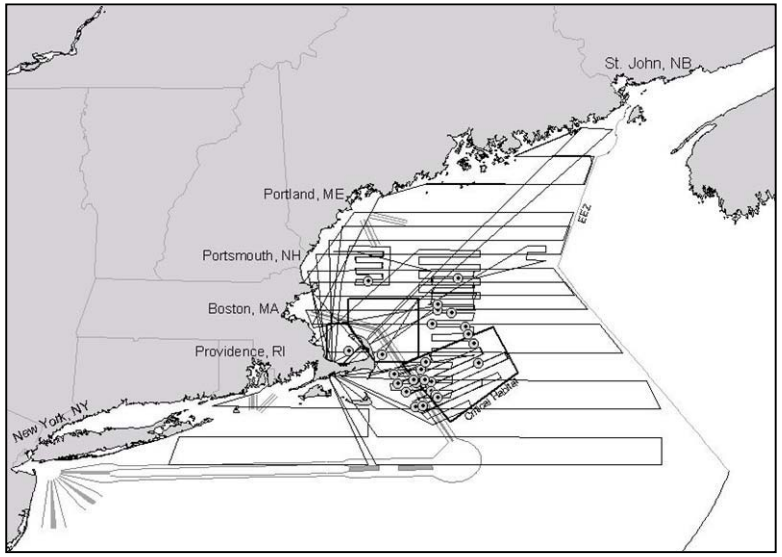
Figure 3 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2004 in the Northeast and Canada region (excluding unconfirmed reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. Shipping lanes, the Hague Line and the Cape Cod Bay and Great South Channel Critical Habitat areas are included for reference.

Table 1. Summary of the flight hours, flight types, and number of right whales seen during 2004 NARWSS flights

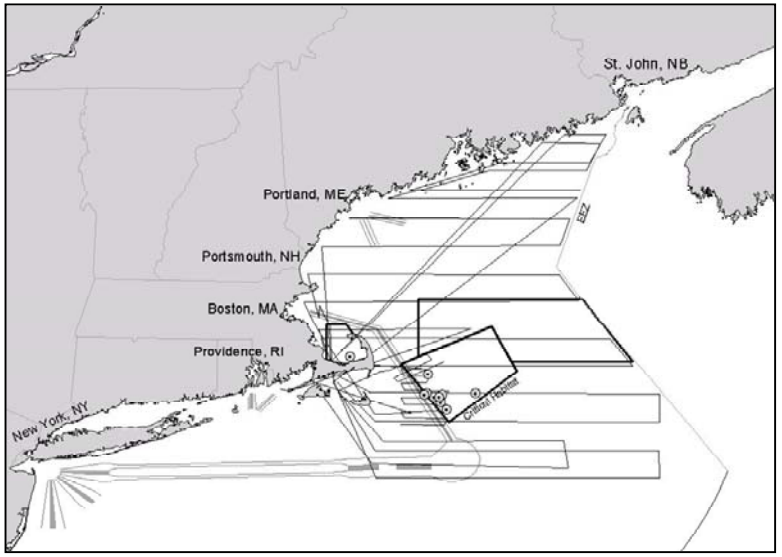
Month in 2004	Flight Hours	Systematic Broadscale Flights *	Systematic Broadscale Series Completed	Critical Habitat Surveys	DAM Surveys	Bombing Range Surveys	# of Right Whales Sighted **
January	0	0	0	0	0	0	0
February	2	0	0	0	1	0	7
March	27	2	0	1	2	1	20
April	71	9	1	1	2	2	69
May	57	11	1	1	1	0	94
June	84	17	2	0	0	1	73
July	13	1	1	1	0	0	6
August	3	0	0	0	1	0	2
September	29	0	0	0	5	2	4
October	34	5	0	0	2	2	1
November	47	8	1	0	0	0	5
December	30	3	1	0	0	0	13
Totals	**397**	**56**	**7**	**4**	**14**	**8**	**294**

* Flights that included both systematic broadscale and management survey time were counted as broadscale flights.
**The number of right whales sighted is a tally of estimated group sizes, not the number of unique individuals identified from photographs.

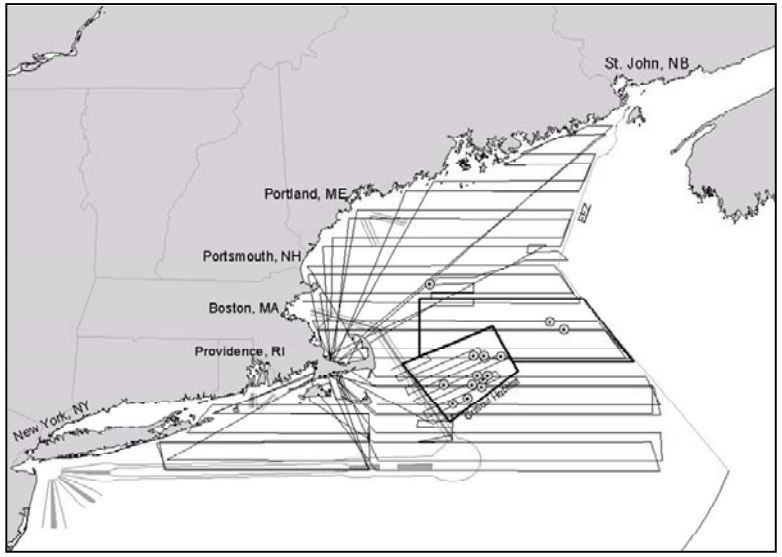
Figure 1. Completed track lines and right whale sighting locations for 2004 NARWSS flights, separated by season. Thin lines represent track lines and bull's eyes represent right whale sighting locations.



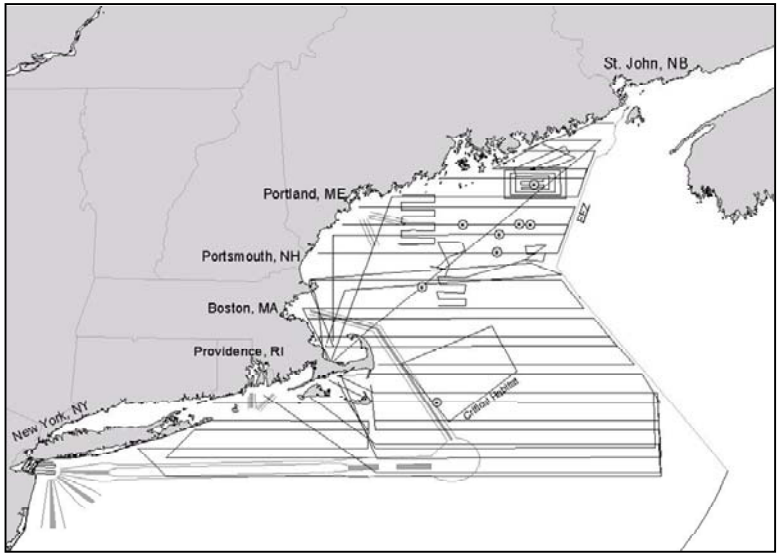
February – April 2004



May 2004



June – July 2004



September – December 2004

Table 2. Total sightings reported to the RWSAS in 2004

Source	# Of Reports	Unconfirmed	Late
Aerial Survey	60	0	0
Shipboard	39	0	0
Opportunistic	48	5	4
Whale Watch	47	0	3
Coast Guard	15	0	3
Commercial Ship	6	2	1
Fishing Vessel	4	1	0
Totals	**219**	**8**	**11**

Figure 2. Sightings reported to the RWSAS in 2004 by source, month and region

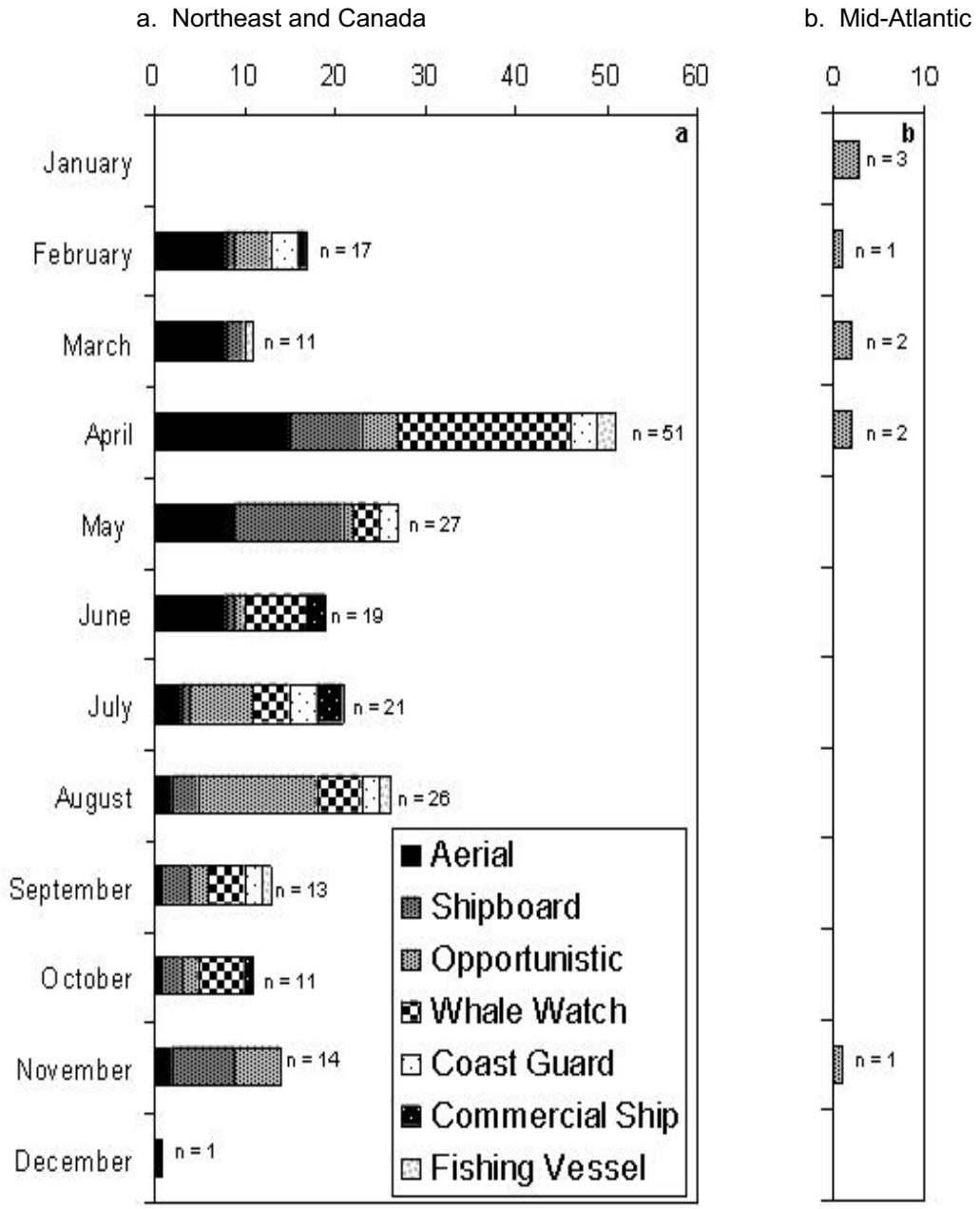
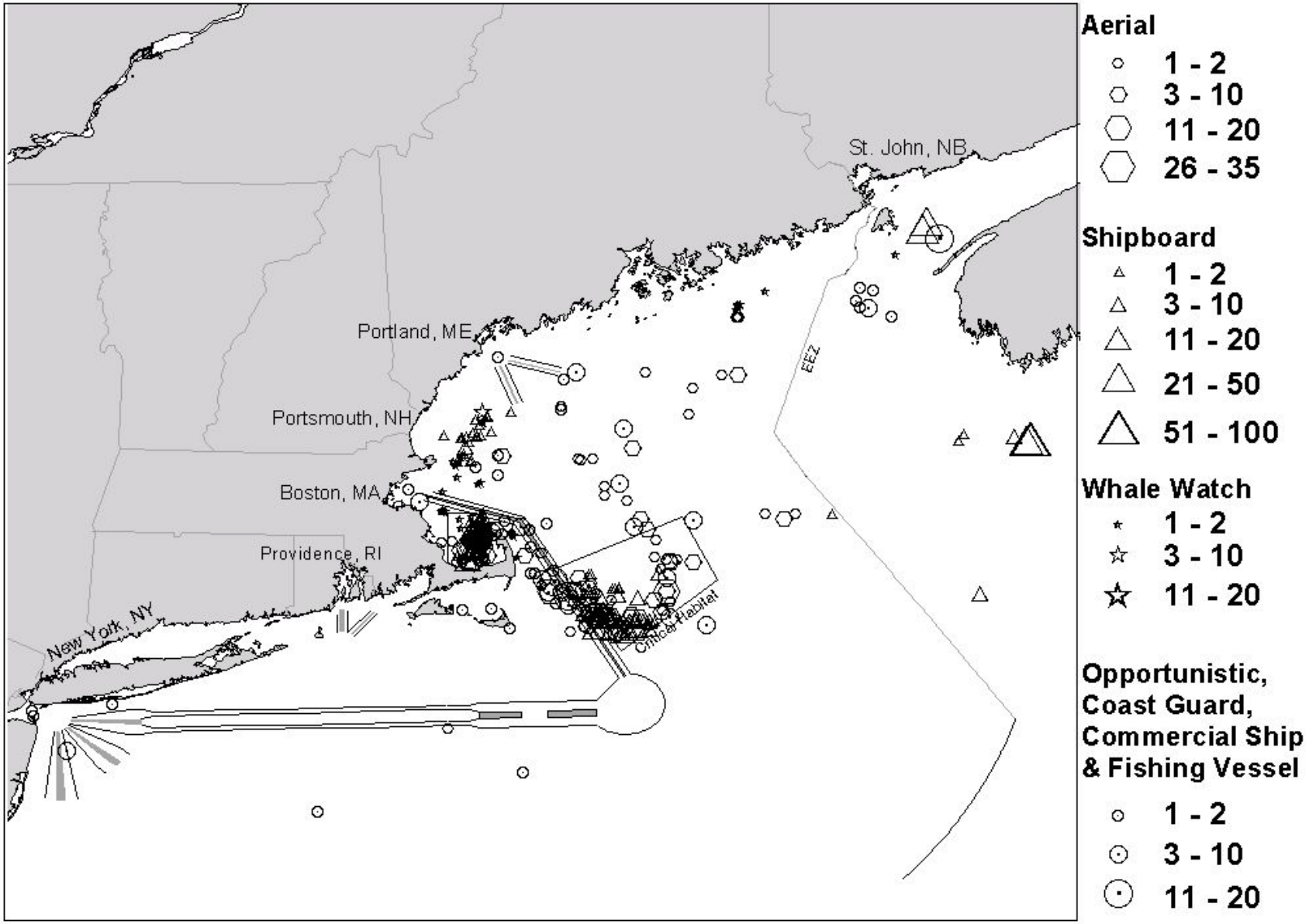


Figure 3. Map of sightings reported to the RWSAS in 2004 in the Northeast region and Canadian waters



Northeast Fisheries Science Center Reference Document 07-18d

North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2005 Results Summary

by Misty Niemeyer, Timothy V.N. Cole, Cynthia L. Christman,
Peter Duley, Misty Nelson, and Brenda Rone

National Marine Fisheries Serv, Woods Hole Lab, 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

October 2007

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 volume is part of a larger document containing five separate results summaries for five separate years. There is no analysis across the years included in this volume. This is the first publication of the collected data; future reports will be published annually in separate volumes.

This document's publication history is as follows: manuscript submitted for review September 26, 2007; manuscript accepted through technical review September 30, 2007; manuscript accepted through policy review October 10, 2007; and final copy submitted for publication October 10, 2007. This document may be cited as:

Niemeyer M, Cole TVN, Christman CL, Duley P, Nelson M, Rone B. 2007. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2005 results summary. US Dept Commer, *Northeast Fish Sci Cent Ref Doc*. 07-18d; 5 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents (Volume D)

D. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2005 Results Summary..... D-1

Tables

Table 1. Summary of flight hours, flight types and number of right whales seen during 2005 NARWSS flights..... D-2
Table 2. Total sightings reported to the RWSAS in 2005 ..... D-4

Figures

Figure 1. Completed track lines and right whale sighting locations for 2005 NARWSS flights, separated by season..... D-3
Figure 2. Sightings reported to the RWSAS in 2005 by source, month and region D-4
Figure 3. Map of sightings reported to the RWSAS in 2005 in the Northeast region and Canadian waters D-5

D. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2005 Results Summary

by Misty Niemeyer, Timothy V.N. Cole, Cynthia L. Christman, Peter Duley, and Misty Nelson

Overview – 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. 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 fax, email, the Internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). These reports are obtained from a variety of sources including the NARWSS, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The results from both the NARWSS and the RWSAS programs in 2005 are summarized in the following tables and figures.

Table 1 – This table provides information on: (a) the total number of the NARWSS flight hours accomplished in each month during 2005; (b) the number of the NARWSS flights conducted in each month by survey type; and (c) the total number of right whales sighted on all the NARWSS flights during each month in 2005. There were four primary types of surveys flown: (1) broadscale; (2) focused surveys in the Great South Channel (GSC) Critical Habitat; (3) focused surveys over potential and realized Dynamic Area Management (DAM) closure zones; and (4) focused surveys in a designated Navy bombing range referred to as W-104B. Broadscale surveys were flown along systematic east-west track lines that covered all Federal waters west of the Hague Line from south of Long Island, New York, to Eastport, Maine. These surveys were flown to provide a synoptic view of the distribution of right whales off the northeastern Atlantic coast; a completed series indicates coverage of the entire area. Surveys focused in the GSC served the dual purpose of providing commercial shipping traffic with the current locations of right whale aggregations, and obtaining photographic data of individual right whales for use in vital rate models of the population. DAM confirmation flights included flights made to investigate reported sightings of right whale aggregations outside existing closures, as well as monitor the duration of residence of aggregations within established DAM zones. Focused surveys in W-104B were conducted by the NARWSS in cooperation with the Navy prior to scheduled bombing exercises to determine the presence or absence of marine mammals and sea turtles. Additional focused flights not categorized in the table were flights to relocate reported whale carcasses or to confirm reported right whale sightings in Nantucket Sound and New York Harbor.

Figure 1 – This figure shows, by season, all the NARWSS survey track lines and right whale sighting locations for 2005. Seasonal right whale closure areas in effect during each period are shown as bold lines. The duration for each closure area is as follows: Cape Cod Bay: Jan 1 - May 15; Great South Channel: April 1 - June 30; Seasonal Area Management (SAM) West: March 1 - April 30; Seasonal Area Management (SAM) East: May 1 - July 31.

Table 2 – This table lists the number of right whale sightings reported to the RWSAS in 2005, by reporting source, and indicates the number of unconfirmed and late reports by source.

Unconfirmed reports did not produce an alert. Reports of 1-2 right whales were not broadcast if the report was received more than one day after the sighting. Late reports of greater than 2 whales did generate an alert since it was likely the location would continue to be occupied by right whales. Often sightings were combined into a single alert. A total of 107 alerts were broadcast in 2005.

Figure 2a – This figure depicts the total number of right whale sightings reported to the RWSAS in 2005, by month and source, in the Northeast (i.e., from Maine through New York) and Canada region.

Figure 2b – This figure depicts the total number of right whale sightings reported to the RWSAS in 2005, by month and source, in the Mid-Atlantic region (i.e., from New Jersey through North Carolina).

Figure 3 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2005 in the Northeast and Canada region (excluding unconfirmed reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. Shipping lanes, the Hague Line and the Cape Cod Bay and Great South Channel Critical Habitat areas are included for reference.

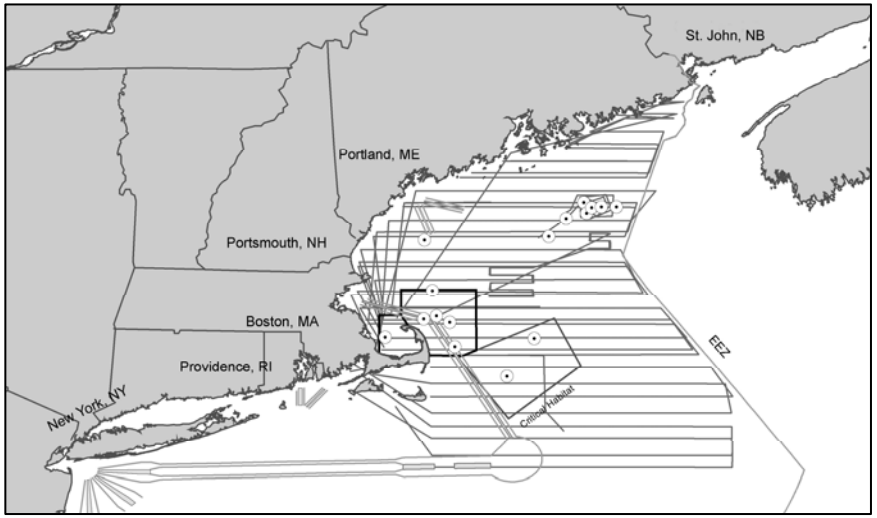
Table 1. Summary of flight hours, flight types and number of right whales seen during 2005 NARWSS flights

Month in 2005	Flight hours	Systematic broadscale flights *	Systematic broadscale series completed	Critical Habitat surveys	DAM surveys	Cashes Ledge (W-104B)	# Right whales sighted **
January	57	8	0	0	2	0	45
February	35	11	1	0	1	1	0
March	50	14	1	0	0	1	15
April	73	17	2	1	0	0	144
May	77	12	1	1	2	0	200
June	56	6	1	1	0	1	146
July	76	11	1	1	0	0	242
August	39	5	1	1	2	0	0
September	47	9	2	0	0	0	2
October	26	6	1	0	0	0	3
November	36	7	0	0	0	0	2
December	45	8	2	0	0	0	32
Totals	**617**	**114**	**13**	**5**	**7**	**3**	**831**

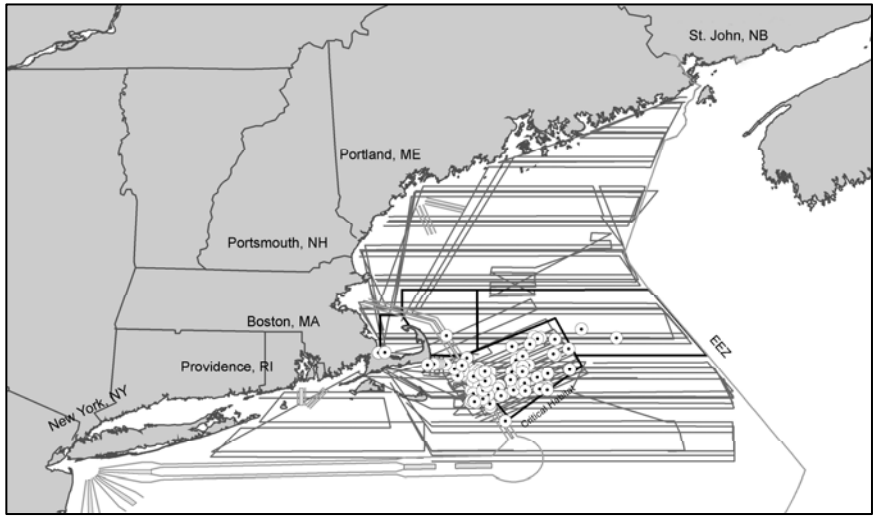
* Flights that included both systematic broadscale and management survey time were counted as broadscale flights.

** The number of right whales sighted is a tally of estimated group sizes, not the number of unique individuals identified from photographs.

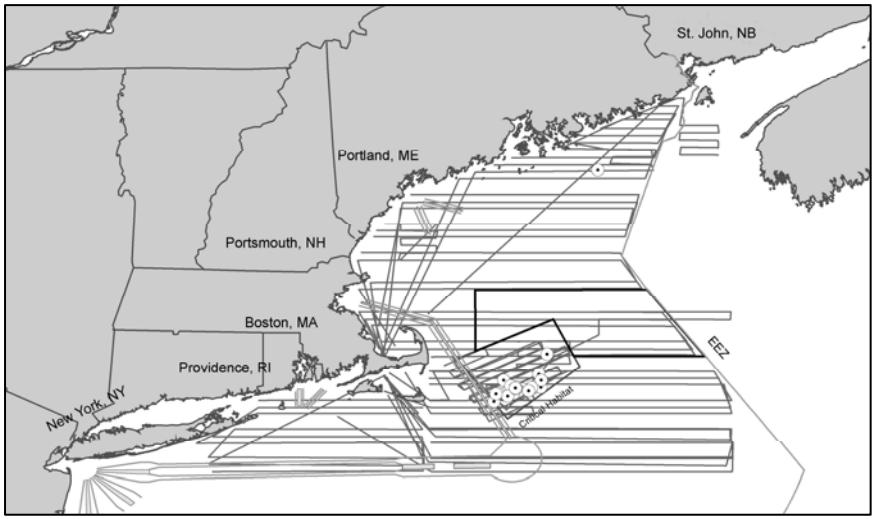
Figure 1. Completed track lines and right whale sighting locations for 2005 NARWSS flights, separated by season. Thin lines represent track lines and bull's eyes represent right whale sighting locations.



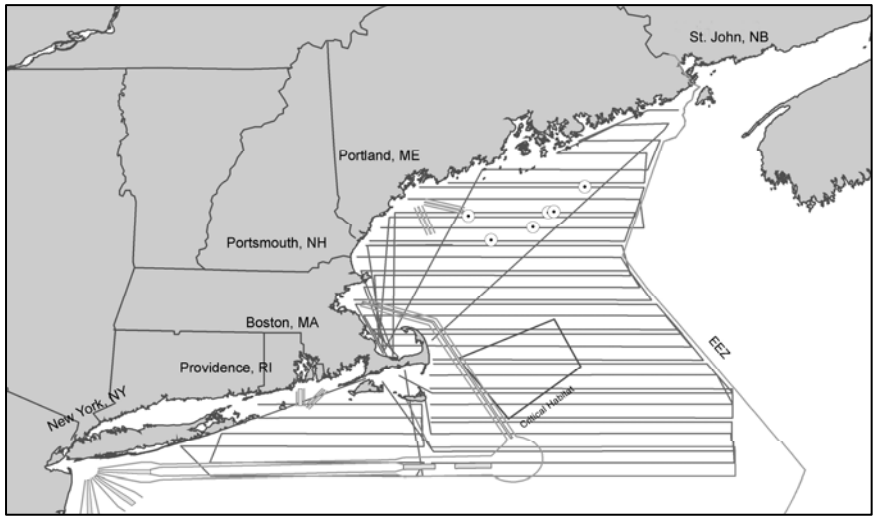
January – March 2005



April – June 2005



July – September 2005



October – December 2005

Table 2. Total sightings reported to the RWSAS in 2005

Source	# of Reports	Unconfirmed	Late*
Aerial Survey	67	0	0
Shipboard Survey	43	0	7
Opportunistic	49	4	7
Whale Watch	49	0	3
Coast Guard	12	0	3
Commercial Ship	3	1	1
Fishing Vessel	3	0	1
Totals	**226**	**5**	**22**

*Reports of 1-2 right whales were not broadcasted if the report was received more than one day after the sighting.

Figure 2. Sightings reported to the RWSAS in 2005 by source, month and region

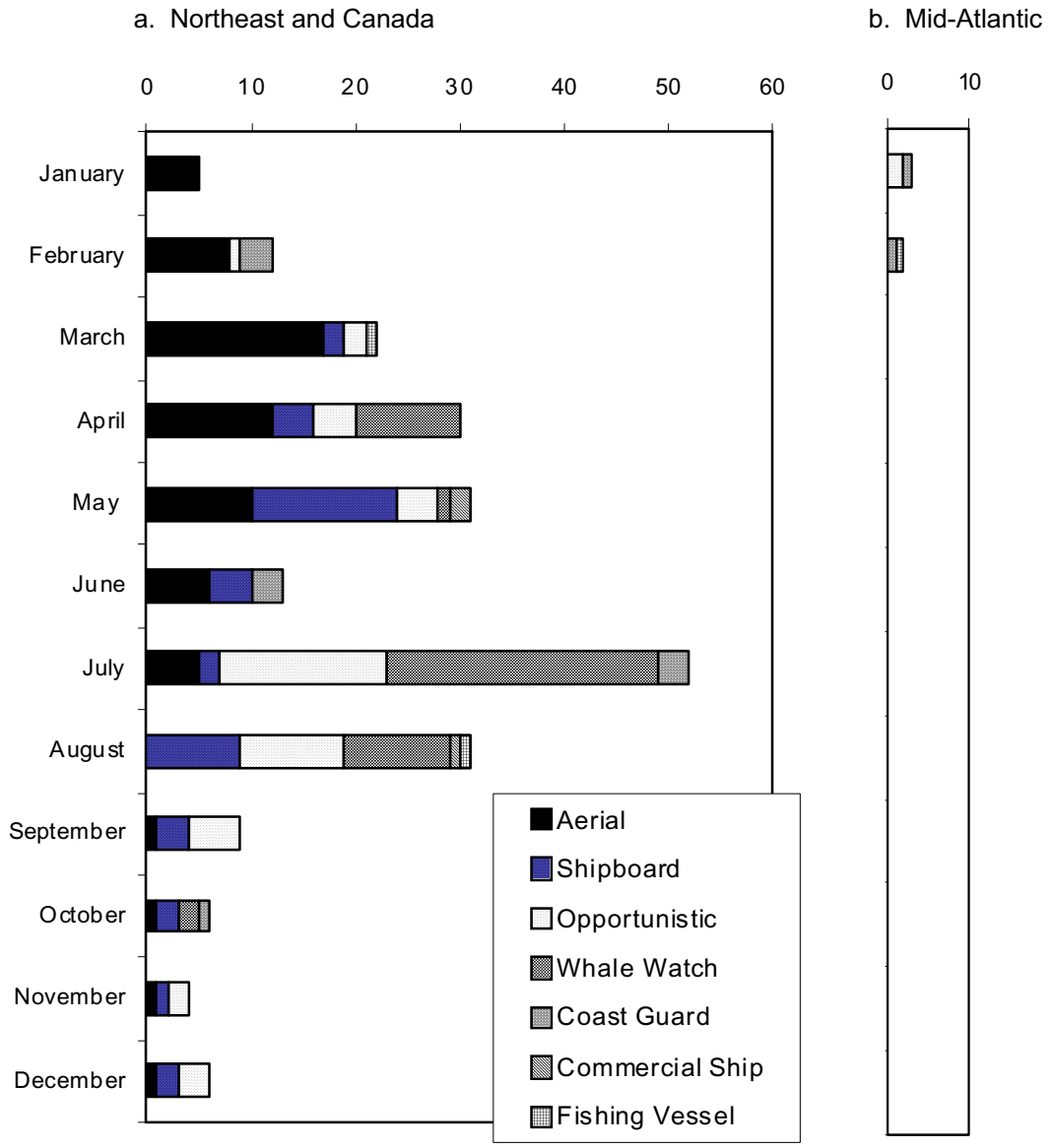
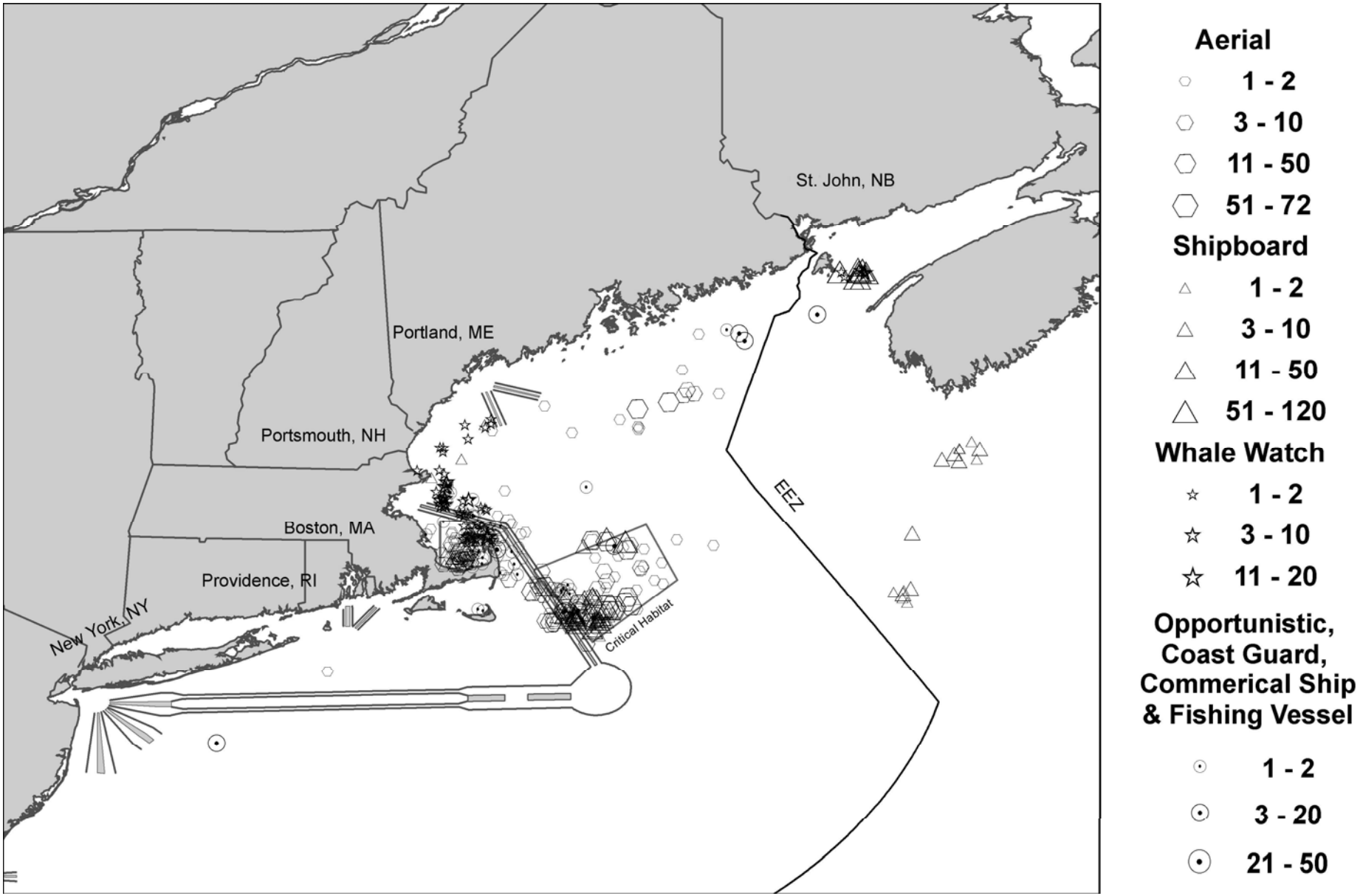


Figure 3. Map of sightings reported to the RWSAS in 2005 in the Northeast region and Canadian waters



Northeast Fisheries Science Center Reference Document 07-18e

North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2006 Results Summary

by Misty Niemeyer, Timothy V.N. Cole, Cynthia L. Christman,
Peter Duley, Alison Glass, & Misty Nelson

National Marine Fisheries Serv, Woods Hole Lab, 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

October 2007

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 volume is part of a larger document containing five separate results summaries for five separate years. There is no analysis across the years included in this volume. This is the first publication of the collected data; future reports will be published annually in separate volumes.

This document's publication history is as follows: manuscript submitted for review April 13, 2007; manuscript accepted through technical review September 30, 2007; manuscript accepted through policy review October 10, 2007; and final copy submitted for publication October 10, 2007. This document may be cited as:

Niemeyer M, Cole TVN, Christman CL, Duley P, Glass A, Nelson M. 2007. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2006 results summary. US Dept Commer, *Northeast Fish Sci Cent Ref Doc*. 07-18e; 6 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Table of Contents (Volume E)

E. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2006 Results Summary.....E-1

Tables

Table 1. Summary of the flight hours, flight types, and number of right whales seen during 2006 NARWSS flights.....E-2
Table 2. Total sightings reported to the RWSAS in 2006 .....E-4

Figures

Figure 1. Completed track lines and right whale sighting locations for 2006 NARWSS flights, separated by season.....E-3
Figure 2. Sightings reported to the RWSAS in 2006 by source, month and region E-4
Figure 3. Map of sightings reported to the RWSAS in 2006 in the Northeast region and Canadian waters E-5
Figure 4. Map of sightings reported to the RWSAS in 2006 in the mid-Atlantic region E-6

E. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2006 Results Summary

by Misty Niemeyer, Timothy V.N. Cole, Cynthia L. Christman, Peter Duley, Allison Glass, Misty Nelson

Overview – 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. 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 fax, email, the Internet, Broadcast Notice to Mariners (BNM), NOAA Weather Radio, and the Mandatory Ship Reporting system (MSR). These reports are obtained from a variety of sources including the NARWSS, whale research organizations, whale watch vessels, Coast Guard, fishing vessels, commercial ships, and the general public. The results from both the NARWSS and the RWSAS programs in 2006 are summarized in the following tables and figures.

Table 1 – This table provides information on: (a) the total number of the NARWSS flight hours accomplished in each month during 2006; (b) the number of the NARWSS flights conducted in each month by survey type; and (c) the total number of right whales sighted on all the NARWSS flights during each month in 2006. There were four primary types of surveys flown: (1) broadscale; (2) focused surveys in the Great South Channel (GSC) Critical Habitat; (3) focused surveys over potential and realized Dynamic Area Management (DAM) closure zones; and (4) focused surveys in a designated Navy bombing range referred to as W-104B. Broadscale surveys were flown along systematic east-west track lines that covered all Federal waters west of the Hague Line from south of Long Island, New York, to Eastport, Maine. These surveys were flown to provide a synoptic view of the distribution of right whales off the northeastern Atlantic coast; a completed series indicates coverage of the entire area. Surveys focused in the GSC served the dual purpose of providing commercial shipping traffic with the current locations of right whale aggregations, and obtaining photographic data of individual right whales for use in vital rate models of the population. DAM confirmation flights included flights made to investigate reported sightings of right whale aggregations outside existing closures, as well as monitor the duration of residence of aggregations within established DAM zones. Focused surveys in W-104B were conducted by the NARWSS in cooperation with the Navy prior to scheduled bombing exercises to determine the presence or absence of marine mammals and sea turtles. Additional focused flights not categorized in the table were flights to relocate reported whale carcasses or entangled whales as well as provide support for disentanglement efforts.

Figure 1 – This figure shows, by season, all the NARWSS survey track lines and right whale sighting locations for 2006. Seasonal right whale closure areas in effect during each period are shown as bold lines. The duration for each closure area is as follows: Cape Cod Bay: Jan 1 - May 15; Great South Channel: April 1 - June 30; Seasonal Area Management (SAM) West: March 1 - April 30; Seasonal Area Management (SAM) East: May 1 - July 31.

Table 2 – This table lists the number of right whale sightings reported to the RWSAS in 2006, by reporting source, and indicates the number of unconfirmed and late reports by source.

Unconfirmed reports and duplicate reports did not produce an alert. Reports of 1-2 right whales were not broadcast if the report was received more than one day after the sighting. Late reports of greater than 2 whales did generate an alert since it was likely the location would continue to be occupied by right whales. Often sightings were combined into a single alert. A total of 101 alerts were broadcast in 2006.

Figure 2a – This figure depicts the total number of right whale sightings reported to the RWSAS in 2006, by month and source, in the Northeast region (i.e., from Maine through New York).

Figure 2b – This figure depicts the total number of right whale sightings reported to the RWSAS in 2006, by month and source, in the Mid-Atlantic region (i.e., from New Jersey through North Carolina).

Figure 2c – This figure depicts the total number of right whale sightings reported to the RWSAS in 2006, by month and source, in the Canada region.

Figure 3 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2006 in the Northeast and Canada region (excluding unconfirmed reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. Shipping lanes, the Hague Line and the Cape Cod Bay and Great South Channel Critical Habitat areas are included for reference.

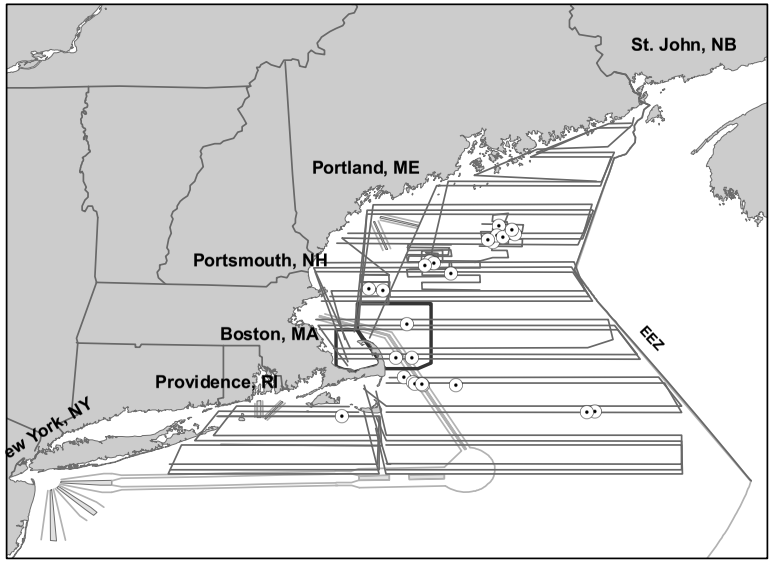
Figure 4 – This figure illustrates the locations of all right whale sightings reported to the RWSAS in 2006 in the Mid-Atlantic region (excluding unconfirmed reports). The number of whales reported in each sighting is indicated via graduated symbols for each reporting source. The Hague Line is included for reference.

Table 1. Summary of the flight hours, flight types, and number of right whales seen during 2006 NARWSS flights

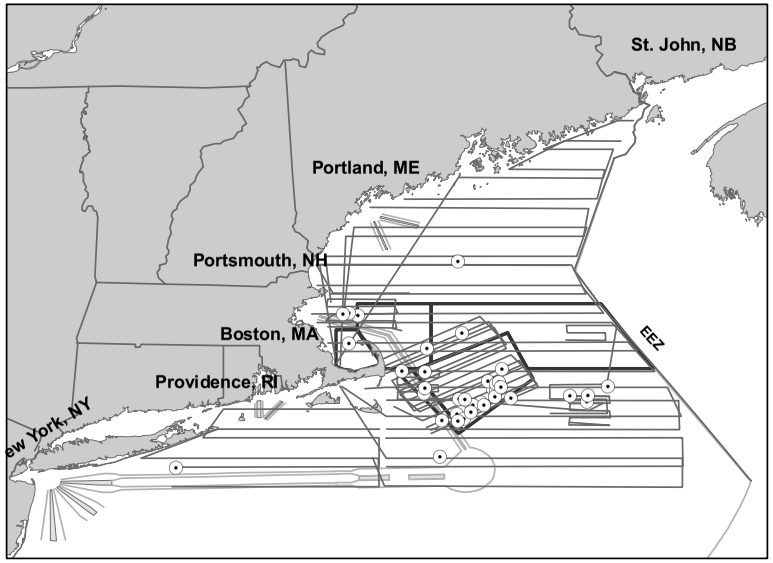
Month in 2006	Flight hours	Systematic broadscale flights *	Systematic broadscale series completed	Critical Habitat surveys	DAM surveys	Cashes Ledge (W-104B)	# Right whales sighted **
January	47	6	0	0	2	0	83
February	49	6	1	0	3	0	18
March	54	10	1	0	1	0	28
April	36	6	1	0	1	0	28
May	51	5	1	2	2	0	132
June	32	4	0	2	1	0	17
July	31	3	1	2	0	1	3
August	0	0	0	0	0	0	0
September	30	6	0	0	0	1	0
October	39	7	1	0	0	1	0
November	50	6	1	0	2	1	74
December	30	3	1	0	1	1	28
Totals	**449**	**62**	**8**	**6**	**13**	**5**	**411**

* Flights that included both systematic broadscale and management survey time were counted as broadscale flights.

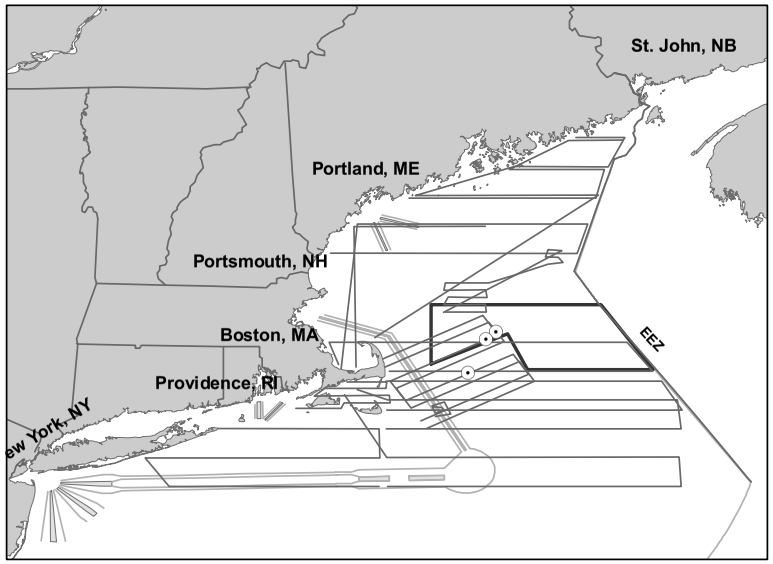
Figure 1. Completed track lines and right whale sighting locations for 2006 NARWSS flights, separated by season. Thin lines represent track lines and bull's eyes represent right whale sighting locations.



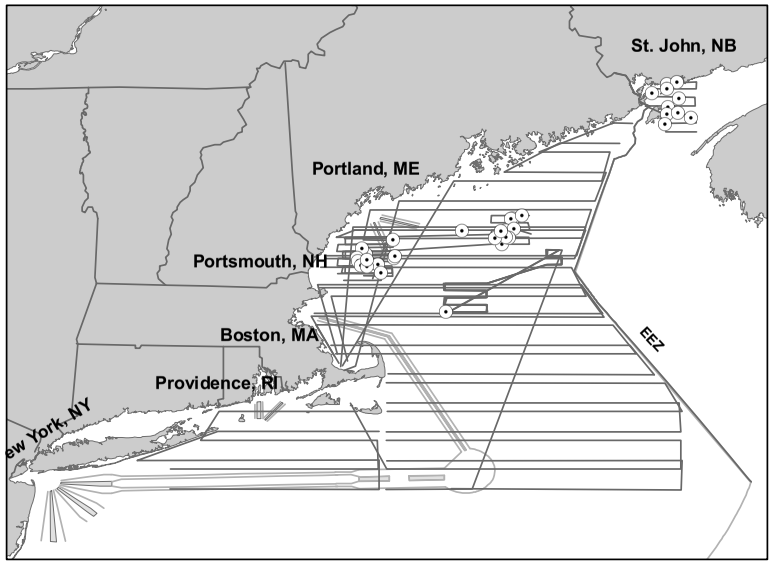
January – March 2006



April – June 2006



July – September 2006



October – December 2006

Table 2. Total sightings reported to the RWSAS in 2006

Source	# of Reports	Unconfirmed*	Late**
Aerial Survey	59	0	4
Shipboard Survey	39	0	18
Whale Watch	53	0	3
Coast Guard	18	2	1
Commercial Ship	5	1	0
Fishing Vessel	3	1	1
General Public	45	7	12
Totals	**222**	**11**	**39**

* Alerts were not generated from unconfirmed reports.
** Reports of 1-2 right whales did not generate alerts if the report was received more than one day after the sighting.

Figure 2. Sightings reported to the RWSAS in 2006 by source, month and region

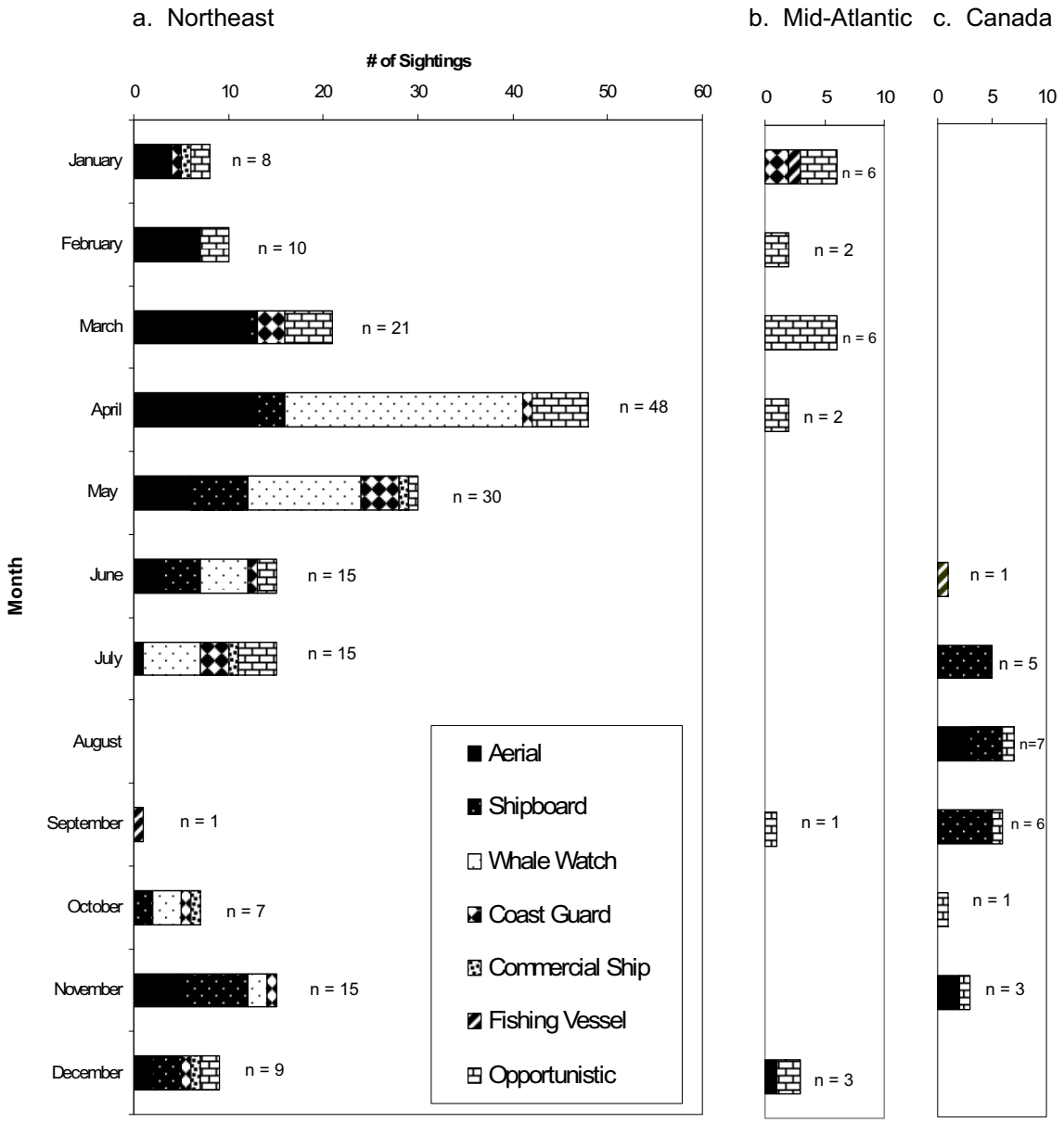


Figure 3. Map of sightings reported to the RWSAS in 2006 in the Northeast region and Canadian waters

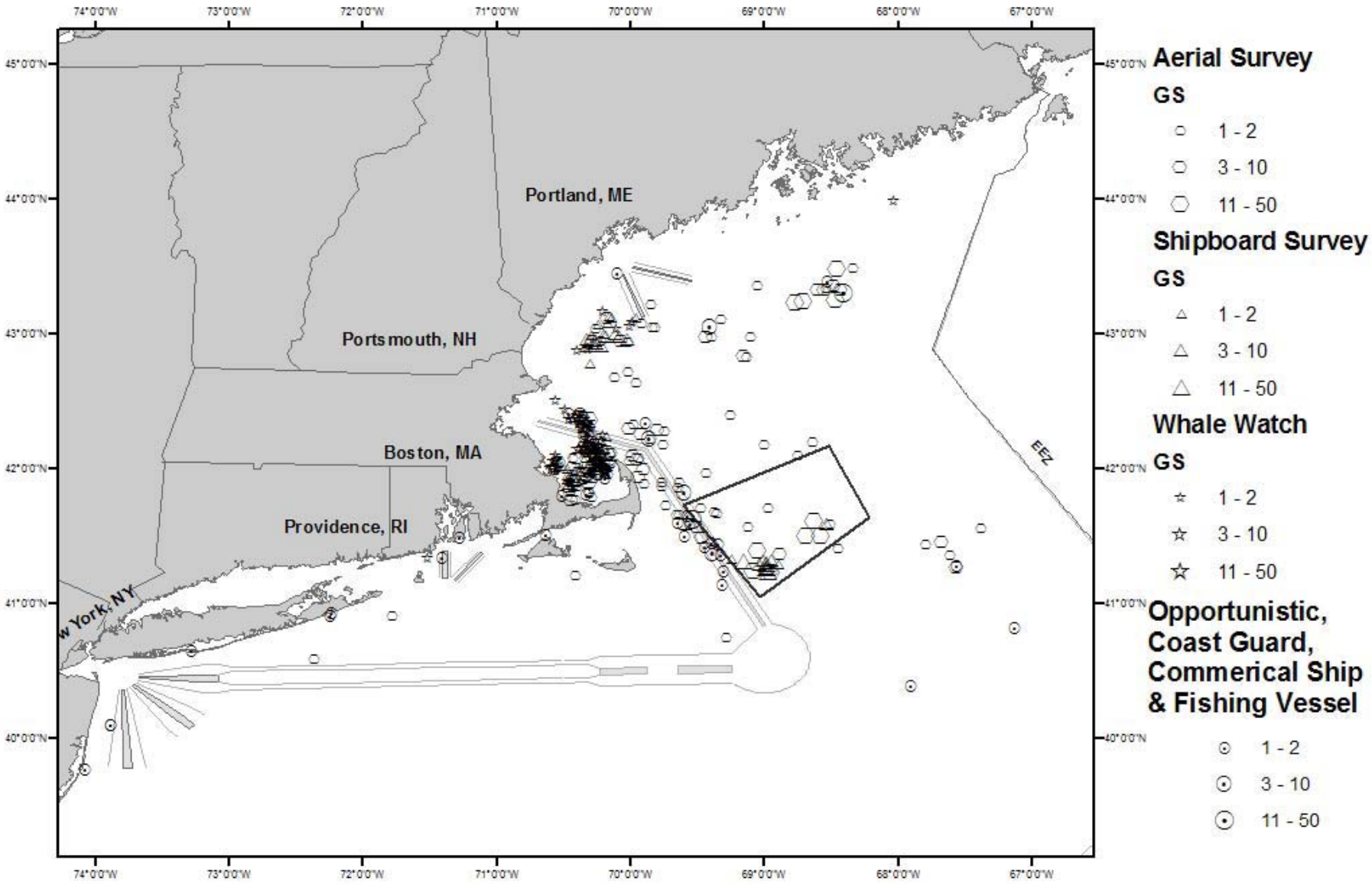
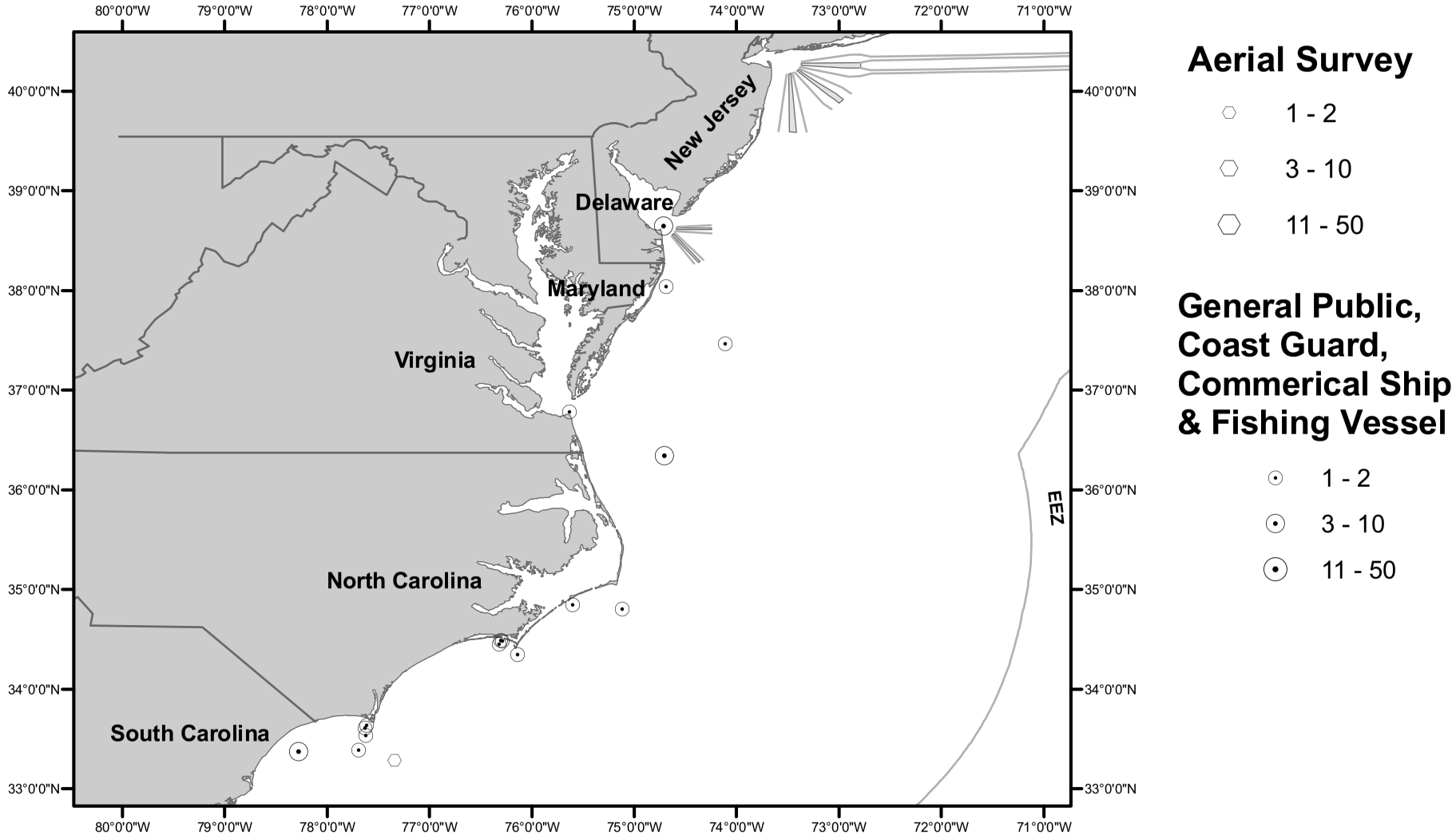


Figure 4. Map of sightings reported to the RWSAS in 2006 in the mid-Atlantic region



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.