Marine mammal sightings and hours at sea during vessel-based habitat sampling cruises of Cape Cod Bay and adjacent waters from the R/V Shearwater NEC-MB2002-1, 2002 (NEC-CoopRes project)

Website: https://www.bco-dmo.org/dataset/2986
Data Type: Cruise Results
Version: 1
Version Date: 2009-03-17

Project
» Northeast Consortium: Cooperative Research (NEC-CoopRes)

Program
» NorthEast Consortium (NEC)

Contributors	Affiliation	Role
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Abstract
Marine mammal sightings and hours at sea during vessel-based habitat sampling cruises of Cape Cod Bay and adjacent waters from the R/V Shearwater NEC-MB2002-1, 2002 (Northeast Consortium Cooperative Research project).

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Coverage

Spatial Extent: **N**:42.5 **E**:-69.5 **S**:41.5 **W**:-71
Temporal Extent: 2002-01-06 - 2002-06-21

Dataset Description

Surveillance, Monitoring, and Management of Right Whales and Habitat of Cape Cod Bay: 2002

Number of opportunistic marine mammal sightings and hours at sea during vessel-based habitat sampling cruises of Cape Cod Bay and adjacent waters, 2002

report: Surveillance, Monitoring and Management of North Atlantic Right Whales in Cape Cod Bay and Adjacent

Waters - 2002 Final Report by Moira W. Brown, Owen C. Nichols, Marilyn K. Marx, and Jacqueline N. Ciano, Charles Mayo, Moriah Bessinger.

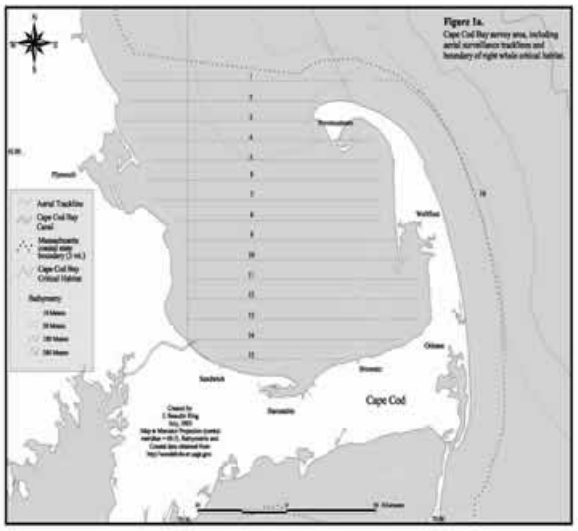
Executive Summary:

In 2002, from aerial and shipboard efforts in all areas combined, there were 139 sightings of right whales, of which 135 right whales were photographed and analyzed for this report. Of those 135 photographed sightings, 54 were from Cape Cod Bay and state waters along the outer coast of Cape Cod between Chatham and Provincetown (39 from aerial surveys and 15 from vessel cruises), 30 were from aerial surveys of Stellwagen Bank/Wildcat Knoll and 51 were from the Great South Channel.

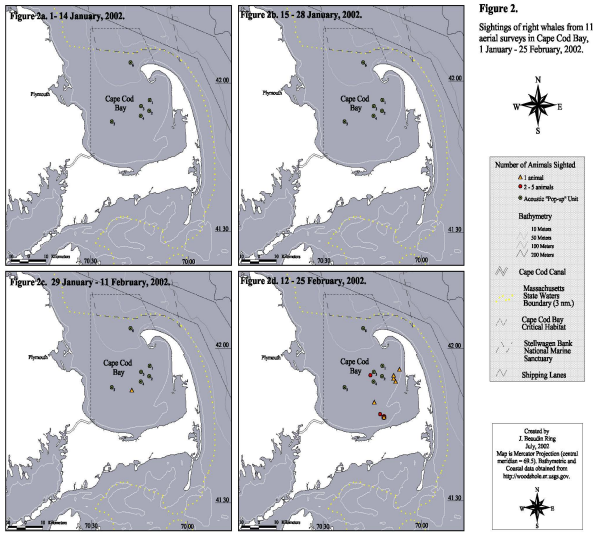
To date, of the 135 photographed sightings, 48 of 54 (88%) in Cape Cod Bay and adjacent state waters and 21 of 30 (70%) in Stellwagen Bank/Wildcat Knoll have been matched to an individual right whale. The 54 sightings from Cape Cod Bay consisted of at least 24 different right whales. There were 18 right whales identified from aerial and vessel surveys and five additional whales that have yet to be matched, but that do not match any of the 18 animals plus one right whale photographed in the Cape Cod Canal on 15 April that was not seen during surveys. The 30 photographed sightings on Stellwagen Bank/Wildcat Knoll represent 29 different right whales of which 21 have been matched to an individual in the catalogue. Of note is one of the identified whales (# 1145), an adult female, which was seen with a calf. This mother calf pair was not recorded during any other surveys or on the calving ground in the southeast US. Our sighting of the calf brings the annual reproduction total for 2002 to 22 calves. Only one whale was seen on more than one occasion (#1424, an entangled right whale) and there remain eight individuals to be matched. There were 51 photographed sightings obtained in the two Great South Channel aerial surveys. Of those, only four whales, two mother-calf pairs also seen on the calving, have been matched. The photographic matching process for the remaining sightings is still underway. None of the matches has undergone final confirmation by researchers the New England Aquarium. This will take place in the autumn of 2002. All sightings were reported upon completion of each survey to the National Marine Fisheries Service Sighting Advisory System. These aerial and vessel surveys are the principal source of right whale sightings for the NMFA/SAS in the winter months for waters in the northeast north of latitude 41°N.

Right whales were documented during aerial surveys of the Cape Cod Bay Critical Habitat area, in state waters west of the critical habitat and along the outer coast of Cape Cod between Chatham and Race Point for 37 days from 7 February to 15 March 2002. These visual sightings were augmented with passive acoustic monitoring in Cape Cod Bay. The bottom-mounted hydrophones recorded low levels of right whale calls from 24 December 2001 through April and early May. The results of the combined research efforts document right whale presence in Cape Cod Bay from late December through April into early May consistent with the results of the past four years. These data support the timing of existing management actions regarding gear restrictions.

The presence of right whales in nearby areas outside of the critical habitats of either Cape Cod Bay or the Great South Channel in 2002 and in past years suggests that a re-evaluation of the area protected by ESA Critical Habitat designation is needed and timely to adequately reflect the distribution and movements of right whales. The use of these areas such as the eastern portion of Stellwagen Bank and Wildcat Knoll has only come to light with the expanded survey efforts of the last five years. Since these areas are used for fishing activity and are transected by a major shipping lane between Boston and New York, consideration should be given to changing the boundaries of the neighboring Cape Cod Bay and Great South Channel Critical Habitats to include these areas of seasonal importance to right whales. We recommend that the data collected in the Stellwagen Bank/Wildcat Knoll area over the last five years be assessed using sightings-per-unit-of-effort analysis to determine the density and seasonality of right whale use and that the area be considered as a target for habitat sampling to assess the conditions of the food resource and for passive acoustic monitoring equipment to augment visual sightings.



(click maps to enlarge)



[Division of Marine Fisheries News article]

Methods & Sampling

Vessel Surveys:
CCS maintains a 40' (12m) long, twin diesel engine research vessel Shearwater. The R/V *Shearwater* has been used successfully for oceanographic sampling and photo-identification in the winter and spring surveillance program in Cape Cod Bay from 1997 through 2002. The R/V Shearwater is equipped with oceanographic sampling equipment including a CTD profiler (conductivity, temperature, depth), plankton nets, surface plankton pump, and flow meter as well as photographic equipment and disentanglement gear.

Although the primary objective of these vessel cruises was habitat sampling, some photographs were collected opportunistically of right whales in the vicinity of the boat during sampling and on transits to and from sampling sites. Photographs of right whales obtained during habitat studies were integrated with the photographs collected during aerial surveillance and included in this report in analyses of residency, capture rates, demographics, and life history. The vessel sighting data were included in the report to the NMFS/SAS system. Sighting data from the daily vessel logs were entered into the Right Whale Initiative DBase program as opportunistic surveys.

Photographic Methods
i) Identification Photographs:

During aerial and shipboard surveys, photographs were taken on Kodak Kodachrome 200ASA color slide film, using hand-held 35-mm cameras equipped with 300-mm telephoto lenses and motor drives. From the air, photographers attempted to obtain good perpendicular photographs of the entire rostral callosity pattern and back of every right whale encountered as well as any other scars or markings. From the boat, photographers attempted to collect good oblique photographs of both sides of the head and chin, the body and the flukes. The data recorder on both platforms was responsible for keeping a written record of the roll and frame numbers shot by each photographer in the daily log.

ii) Photo-analysis and Matching:
Photographs of right whale callosity patterns are used as a basis for identification and cataloging of individuals, following methods developed by Payne et al (1983) and Kraus et al (1986). The cataloging of individually identified animals is based on using high quality photographs of distinctive callosity patterns (raised patches of roughened skin on the top and sides of the head), ventral pigmentation, lip ridges, and scars (Kraus et al 1986). NEAq has curated the catalogue since 1980 and to the best of their knowledge, all photographs of right whales taken in the North Atlantic since 1935 have been included in NEAq's files. This catalogue allows scientists to enumerate the population, and, from resightings of known individuals, to monitor the animals' reproductive status, births, deaths, scarring, distribution and migrations. Since 1980, a total of 26,275 sightings of 436 individual right whales have been archived, of which 327 are thought to be alive, as of December 2001 (A. Knowlton, NEAq, pers. comm.)

The matching process consists of separating photographs of right whales into individuals and inter-matching between days within the season. To match different sightings of the same whale, composite drawings and photographs of the callosity patterns of individual right whales are compared to a limited subset of the catalogue that includes animals with a similar appearance. For whales that look alike in the first sort, the original photographs of all probable matches are examined for callosity similarities and supplementary features, including scars, pigmentation, lip crenulations, and morphometric ratios. A match between different sightings is considered positive when the callosity pattern and at least one other feature can be independently matched by at least two experienced researchers (Kraus et al 1986). Exceptions to this multiple identifying feature requirement include whales that have unusual callosity patterns, large scars or birthmarks, or deformities so unique that matches from clear photographs can be based on only one feature. Preliminary photo-analysis and inter-matching was carried out at CCS, with matches confirmed using original photographs cataloged and archived at NEAq.

iii) Photographic Data Archiving
Upon completion of the matching process, all original slides were returned to CCS and incorporated into the CCS catalogue of identified right whales to update existing files, using the same numbering system as NEAq, in archival quality slide sheets. New England Aquarium (NEAq) archives copies of photographs representing each sighting. Copies of photographs of individuals that are better than existing records, and photographs of newly identified whales, will be included in the NEAq master files as "type specimens" for future reference. The master files are maintained in fireproof safes at NEAq. All catalogue files are available for inspection and on-site use by contributors and collaborators.

Data Processing Description

Vessel Surveys:
In 2002, the right whale habitat sampling team was in position in Cape Cod Bay for 135 days from 1 January through 15 May. There were a total of 17 vessel days during which oceanographic data were collected in Cape Cod Bay (14) and adjacent waters (3) in 2002 (Table 3). The primary purpose of these habitat sampling cruises was to collect oceanographic data in the Cape Cod Bay Critical Habitat area weekly to compare concentrations of right whales from aerial surveys with the food resource determined from samples obtain at sea. Please see chapter two of this report for the results and discussion (Mayo, Bessinger and Brown 2002).

The vessel crew located the right whales for the first time during a cruise on 14 February (Table 3). Although they searched for the whale observed from the plane on 7 February, they were unable to locate the animal. The last day right whales were observed from the vessel was on 7 March (Table 3). The photos collected on the vessel have been compared to the ones obtained from the aircraft and were taken through the same matching process as detailed above. The crew on board the vessel did locate right whales north of the critical habitat on 20 April.

In addition there were several cruises in collaboration with Cornell University to deploy bottom mounted autonomous acoustic sensors (acoustic pop-ups) in six locations in Cape Cod Bay (see Appendix IV) and two

days spent working with the team from National Geographic to attempt to attach a 'Crittercam' to a right whale using suction cups. CRITTERCAM, developed by Greg Marshall, Director/Executive Producer, Remote Imaging, National Geographic, is a small, streamlined, integrated imaging and data-logging system that obtains video footage of the underwater environment of the whale. The goal of this project was to use crittercam to learn about the underwater foraging techniques of right whales, a behavior which is not well known of other than at the surface. It is known from other tagging studies that they generally feed at the depth with the greatest concentration of plankton and that there is a burst and glide fluke stroke pattern when the whales are swimming horizontally through the water (D. Nowacheck, WHOI, unpublished data). A second goal was to learn about what the open mouth of a right whale looks like underwater. This information has potential to inform out work on entanglements of right whales in fishing lines and what modifications might reduce the risk of entanglement. The attempts to attach a crittercam in 2002 were not successful, but a lot was learned about deploying the crittercam that will assist in further attempts next year.

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Data Files

File
whales_ship.csv (Comma Separated Values (.csv), 19.25 KB) MD5:5036ff4ca7bda1b48a973d90f1cb812c Primary data file for dataset ID 2986

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Related Publications

Cape Cod Bay Right Whale Update, Massachusetts Division of Marine Fisheries (pub.), DMF News Second Quarter April - June 2001, vol 21, page 5. https://www.mass.gov/files/documents/2016/08/uv/dmfnq201.pdf
General

Moira W. Brown, Owen C. Nichols, Marilyn K. Marx, and Jacqueline N. Ciano (2002) Surveillance, Monitoring and Management of North Atlantic Right Whales in Cape Cod Bay and Adjacent Waters - 2002 - Final Report, Center for Coastal Studies and New England Aquarium, submitted to Division of Marine Fisheries, Commonwealth of Massachusetts. https://www.mass.gov/files/documents/2016/08/wh/rwhale02.pdf
Results

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Parameters

Parameter	Description	Units
region	region of observations, either Cape Cod Bay or adjacent areas	
cruiseid	cruise identifier	
year	year of observation	
month_local	month of observation	
day_local	day of month when observation was made	
species	species codes: Eubalaena_glacialis_sighted = # of right whales sighted Eubalaena_glacialis_photos = # of right whales photographed Eubalaena_glacialis_ids = # of right whales identified	
count	number of individuals sighted	
comments	other information	
hrs_at_sea	# hours of at-sea observation	
yrday_local	local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	unitless

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Instruments

Dataset-specific Instrument Name	Camera
Generic Instrument Name	Camera
Dataset-specific Description	Kodak Kodachrome Photos taken on 200ASA color slide film, using hand-held 35-mm cameras equipped with 300-mm telephoto lenses and motor drives.
Generic Instrument Description	All types of photographic equipment including stills, video, film and digital systems.

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Deployments

NEC-MB2002-1

Website	https://www.bco-dmo.org/deployment/57856
Platform	R/V Shearwater
Report	http://nec.whoi.edu/pdf/Rwhale02.pdf
Start Date	2002-01-06
End Date	2002-06-21

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Project Information

Northeast Consortium: Cooperative Research (NEC-CoopRes)

Website: http://northeastconsortium.org/

Coverage: Georges Bank, Gulf of Maine

The Northeast Consortium encourages and funds cooperative research and monitoring projects in the Gulf of Maine and Georges Bank that have effective, equal partnerships among fishermen, scientists, educators, and marine resource managers.

The Northeast Consortium seeks to fund projects that will be conducted in a responsible manner. Cooperative research projects are designed to minimize any negative impacts to ecosystems or marine organisms, and be consistent with accepted ethical research practices, including the use of animals and human subjects in research, scrutiny of research protocols by an institutional board of review, etc.

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Program Information

NorthEast Consortium (NEC)

Website: http://northeastconsortium.org/

Coverage: Georges Bank, Gulf of Maine

The Northeast Consortium encourages and funds
cooperative research and monitoring projects in the Gulf of Maine and Georges Bank that have effective, **equal partnerships** among fishermen, scientists, educators, and marine resource managers.

At the 2008 Maine Fisheremen's Forum, the Northeast Consortium organized a session on data collection and availability. Participants included several key organizations in the Gulf of Maine area, sharing what data are out there and how you can find them.

The Northeast Consortium has joined the Gulf of Maine Ocean Data Partnership. The purpose of the GoMODP is to promote and coordinate the sharing, linking, electronic dissemination, and use of data on the Gulf of Maine region.

The Northeast Consortium was created in 1999 to encourage and fund effective, equal partnerships among commercial fishermen, scientists, and other stakeholders to engage in cooperative research and monitoring projects in the Gulf of Maine and Georges Bank. The Northeast Consortium consists of four research institutions (University of New Hampshire, University of Maine, Massachusetts Institute of Technology, and Woods Hole Oceanographic Institution), which are working together to foster this initiative.

The Northeast Consortium administers nearly $5M annually from the National Oceanic and Atmospheric Administration for cooperative research on a broad range of topics including gear selectivity, fish habitat, stock assessments, and socioeconomics. The funding is appropriated to the National Marine Fisheries Service and administered by the University of New Hampshire on behalf of the Northeast Consortium. Funds are distributed through an annual open competition, which is announced via a Request for Proposals (RFP). All projects must involve partnership between commercial fishermen and scientists.

The Northeast Consortium seeks to fund projects that will be conducted in a responsible manner. Cooperative research projects should be designed to minimize any negative impacts to ecosystems or marine organisms, and be consistent with accepted ethical research practices, including the use of animals and human subjects in research, scrutiny of research protocols by an institutional board of review, etc.

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Funding

Funding Source	Award
National Oceanic and Atmospheric Administration (NOAA)	unknown NEC-CoopRes NOAA

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