

North Atlantic Right Whale Consortium 2010 Annual Report Card

NORTH ATLANTIC RIGHT WHALE CONSORTIUM BACKGROUND

The North Atlantic right whale (*Eubalaena glacialis*) remains one of the most endangered large whales in the world. The interest in addressing the problems hampering the recovery of North Atlantic right whales using innovative research techniques, new technologies, and continued analyses of existing databases has increased significantly over the past fifteen years. This increased interest necessitated better coordination and collaboration among all stakeholders to ensure that there was improved access to data, research efforts were not duplicative, and that findings are shared with all interested parties. The North Atlantic Right Whale Consortium, initially formed in 1986 by five research institutions to share data among themselves, was expanded in 1997 to address these greater needs. Currently, the Consortium membership is comprised of representatives from more than 100 entities including: research, academic, and conservation organizations; shipping and fishing industries; whale watching companies; technical experts; U.S. and Canadian Government agencies; and state and provincial authorities.

The Consortium's mission is to ensure the survival of North Atlantic right whales. To accomplish this goal, the Consortium membership is committed to long-term research and management efforts and to coordinate and integrate the wide variety of databases and research efforts related to right whales to provide the relevant management groups with the best scientific advice and recommendations on right whale conservation. The Consortium is also committed to incorporating new and updated methods with its membership, providing up-to-date information on right whale biology and conservation to the public, and maintaining effective communication with U.S. and Canadian Government agencies, state and provincial authorities, the Canadian Right Whale Network, the U.S. Right Whale Implementation Teams, the Atlantic Large Whale Take Reduction Team, the NMFS Scientific Review Group, and members of Congress. The Consortium membership supports the maintenance and long-term continuity of the separate research programs under its umbrella, and serves as executor for database archives that include right whale sightings and photo-identification data contributed by private institutions, government scientists and agencies, and individuals. Lastly, the Consortium is interested in maximizing the effectiveness of management measures to protect right whales, including using management models from other fields.

The Consortium is governed by an Executive Committee and Board members who are elected by the general Consortium Membership at the Annual Meeting.

2010 ANNUAL NORTH ATLANTIC RIGHT WHALE REPORT CARD

North Atlantic Right Whale Consortium members agreed in 2004 that an annual "report card" on the status of right whales would be useful. This report card includes updates on the status of the catalogued population, mortalities and entanglement events, and a summary of current management and research efforts that have occurred over the previous 12 months. The Board's goal is to make public a summary of current research and management activities, as well as provide detailed recommendations for future activities. The Board views this report as a valuable asset in assessing the effects of research and management over time. The 2010 annual report card includes information from November 1 2009 – October 31 2010.

Essential Population Monitoring

In the 2009 Report Card to the International Whaling Commission (IWC) the Consortium Board identified key monitoring efforts that must be continued and maintained in order to identify trends in the population as well as assess the factors behind any changes in these trends (Pettis, 2009). The key efforts are: (1) Photographic Identification and cataloging in southeast United States, Cape Cod Bay, Great South Channel, Bay of Fundy, Scotian Shelf, and Jeffreys Ledge, (2) Monitoring of scarring and visual health assessment from photographic data, (3) Examination of all mortalities, and (4) Continue using photo-ID and genetic profiling to monitor population structure and how this changes over time. The Board maintains that these efforts remain critical to right whale conservation.

Population Status: 2009

Estimate of Catalogued North Atlantic Right Whales: 2009 (see detailed explanation of calculation at end of report)

The ability to monitor North Atlantic right whale vital rates is entirely dependent on the right whale identification database. Curated by the New England Aquarium, the database consists of over 500,000 slides, prints, and digital images collected during the 55,000 sightings of over 600 individual right whales photographed since 1935. Each year, 3,000 to 5,000 sightings consisting of 20-30,000 images are added to the identification database. Due to the lag time in processing data, the most recent estimate of the catalogued population available is for 2009.

In 2009, the best estimate of catalogued North Atlantic right whales was 473 individuals. Low and high estimates were also calculated (Figure 1 below). This “best estimate” is based upon the number of photographed whales, but it excludes potential unphotographed whales, and therefore should **not** be considered a “population estimate”. This photo-identification estimate includes 439 catalogued whales that were presumed to be alive in 2009 because they were seen in that year, or any time in the prior six years (Knowlton et al. 1994). The estimate also includes 18 calves from 2008 or 2009 that were considered suitable for eventual inclusion in the catalog and 16 other whales that did not match the catalog, but were re-identified in at least one subsequent year (excluding sightings in field seasons that spanned the calendar year).

Low: 239 individuals
239 Cataloged whales seen in 2009
Middle: 473 individuals
439 Cataloged whales presumed alive in 2009
16 Intermatch whales likely to be added to Catalog
18 Calves from 2008 and 2009 likely to be added to Catalog
High: 640 individuals
581 All Cataloged whales in 2009 minus those known dead
30 All active intermatch codes without 2008 & 2009 calves
29 All uncataloged 2008 and 2009 calves minus dead

Figure 1. Estimates of the number of catalogued whales in the North Atlantic Right Whale Identification Catalogue. A detailed explanation of calculations can be found at the end of this report. Analysis 10/19/10.

Population Over Time

Below are assessments of the number of photo-identified right whales within the population over time based on three available methods. The presumed alive is a consistently measureable and easily available value, but is not an accurate estimate of recent catalogued population size due to delays in data processing. The report card number is the only number that assesses animals that are not yet cataloged and is best number for the previous year. The fact that the all but the last report card number are below the blue line means that the numbers in the report card are conservative. The stock assessment numbers are published (Waring et. al, 2009), but appear to be conservative and have a substantial delay

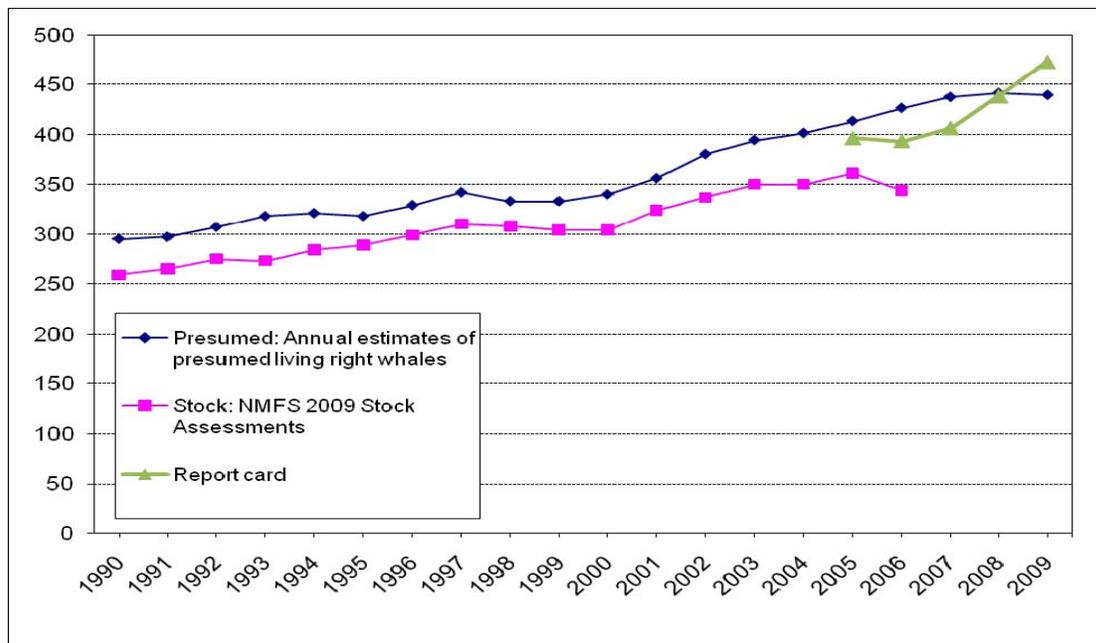


Figure 2. Assessments of the North Atlantic right whale population based on three available assessment methods.

Reproduction: 2010

19 calves were born this year.
 Average calving interval of 2010 moms was 3.3 years.
 There were four first time moms

Mortalities

Between 01 November 2009 and 31 October 2010, five right whale mortalities were documented (Table 1). Since the 2005 Report Card, the Consortium Board recognizes necropsies as significant data collection events that provide valuable information on which management and conservation measures can be (and have been) made. The Board views consistent necropsy response and support (both financial and personnel) as critical to monitor both right whale recovery and the efficacy of management actions.

Table 1. Documented right whale mortalities 01 November 2009- 31 October 2010 (MJM – Michael Moore; COA – College of the Atlantic; AVC – Atlantic Veterinary College).

Whale	Date	Location	Sex	Age	Necropsy Field #	Cause	Comments
--	21 December 2009	70 km ESE Nantucket Island, MA	Unknown	Unknown	--	--	Located by Coast Guard. Photo documented. Not relocated.
2010 Calf of 3260	01 March 2010	Florida	Unknown	Calf	--	--	Calf lost between 24 Feb 2010 and 01 Mar 2010
--	29 June 2010	90 km off Atlantic City, NJ	Male	Adult	MJM070110	Entanglement	Necropsy led by Michael Moore
--	02 July 2010	40 km SW Grand Manan Island, NB	Unknown	Sub adult, possible calf	COA100702Eg	Probable shipstrike	Sampled at sea 11 Aug 2010. Prop wounds. Unable to retrieve for necropsy.
--	13 Aug 2010	Nova Scotia	Male	Adult	AVC case x22447-10	Probable entanglement	Necropsy led by Pierre-Yves Daoust

Non-Fatal Entanglements and Vessel Strikes

These cases are classified as non-fatal because the animals were alive when last seen.

Entanglements:

There were four new entanglement cases (whales carrying gear, bolded) reported between 01 November 2009 and 31 October 2010 (Table 2). Table 2 includes previously reported entanglements that have pertinent updates.

Vessel Strikes:

There were two confirmed and one possible vessel strikes reported between 01 November 2009 – 31 October 2010.

- Right whale #3745, a male born in 2007, was documented with a series of new propeller wounds on 15 December 2009 off of the coast of Georgia. Prior to this sighting, the whale was last seen on 21 September 2009 and the wounds were not present. It was subsequently seen in August 2010 in the Bay of Fundy.

- The 2008 calf of #1703 was sighted off the coast of Florida with propeller wounds on its head on 15 February 2010. The prior sighting of this whale without the wounds was on 24 September 2008 in the Bay of Fundy. This two year old whale was subsequently seen on Jeffreys Ledge on 30 July 2010.
- On 14 December 2009 a US Coast Guard cutter reported a probable whale strike NW of Cape Hendy, VA. No whales were seen prior to the strike and the actual strike was not witnessed, but USCG crew stated that they felt the impact. Following the strike, two whales surfaced off the bow of the vessel. No injuries were apparent. The whales were described as having v-shaped blows. Surveys (both aerial and vessel) were done of the area for several days following the strike and no right whales or injured whales were seen.

Table 2. Right whale entanglements and status updates 01 November 2009 – 31 October 2010. Newly reported entanglements (carrying gear) are bolded.

Whale#	Date of First Entanglement Sighting	First location	Sex	Age (current)	Comments
3850	26 November 2009	Cape Lookout, NC	Unknown	1	Reported 08 December 2009, sighted gear free 14 January 2010
3420	31 January 2009	Florida	Female	6	Confirmed gear free 19 February 2010
1140	06 March 2008	Cape Cod Bay	Female	Adult, first sighted 1981	Disentangled 01 May 2010
2470	13 May 2010	Great South Channel	Male	Adult, first sighted 1994	Disentangled
1503	10 September 2010	Jeffreys Ledge	Female	25	Entangled between 13 April 2010 and 10 Sep 2010. Not seen since 9/2010 sighting.
3120	20 October 2010	Jeffreys Ledge	Male	9	Seen on Jeffreys Ledge 19 October 2010 without gear. Prior entanglement event: Entangled in April 2002, partially disentangled August 2002, sighted gear-free September 2004.

Aerial and Vessel-based Sightings November 2009 – October 2010

Catalogued sighting information through 31 October 2010 and includes survey, research, and opportunistic sightings. Major contributing organizations (>10% total sightings for region) listed after total number of sightings. Not all data have been received and/or entered. Survey platforms and sighting totals may change.

Major Contributing Organizations:

BOS: Blue Ocean Society
CWI: Canadian Whale Institute
FWRI: Fish and Wildlife Research Institute
GDNR: Georgia Department of Natural Resources
NEAQ: New England Aquarium
NEFSC: Northeast Fisheries Science Center
PCCS: Provincetown Center for Coastal Studies
PSU: The Pennsylvania State University
UNCW: University of North Carolina Wilmington
WCNE: Whale Center of New England
WT: Wildlife Trust

Southeast United States (sightings: 2009/2010=1345; NEAq, FWRI, WT, GDNR, UNCW, NEFSC)

- Aerial surveys December through March 2009-2010
- Biopsy darting and vessel photo-ID

New England (sightings: 2010=456; PCCS, NEFSC, PSU)

- Aerial surveys and habitat sampling January – April

Jeffrey's Ledge (sightings: 2010=59; NEFSC, WCNE)

- Aerial and vessel surveys November - January

Great South Channel (sightings: 2010=287; NEFSC, PCCS)

- Aerial surveys Mar – May
- Vessel surveys May

Gulf of Maine (sightings: 2010=250; NEFSC, PCCS)

- Aerial surveys November –January, April-May

Bay of Fundy (sightings: 2010=131; NEAq, Becky Woodward)

- Vessel surveys August-October

Mid-Atlantic (sightings: 2010=181; NEFSC, WT)

- Aerial November – April

Roseway Basin (sightings: 2010=55; NEAq/CWD)

- Vessel surveys August

Partial Listing of Research Analyses Underway in 2010

- Spatial and temporal variation in the copepod prey-field of North Atlantic Right Whales in the Scotia-Fundy region
- Shark predation on North Atlantic right whale calves.
- Estimating the nutritional requirements of North Atlantic right whales (*Eubalaena glacialis*) with a generalized bioenergetics model
- Investigating possible cause(s) of low reproductive success in North Atlantic right whales with a specific focus on chronic exposure to contaminants, including PCBs and PAHs
- Correlate the occurrence of “double up-calls” recorded off SEUS with the known spatial and temporal occurrence of observed mother-calf pairs
- Spatio-temporal analysis of right whale mortalities along the Canada/USA eastern seaboard
- Defining the Transfer Functions of the PCAD Model in North Atlantic Right Whales (*Eubalaena glacialis*): Retrospective Analyses of Existing Data
- Investigating entanglement rates in North Atlantic right whales
- Entanglement risk and severity models
- Foraging behavior
- Acoustic behavior
- Distribution and defining critical habitats
- Investigating energy expenditure in right whales
- Determining the probability of lethal vessel strikes

Management and Mitigation Activities

- On October 6, 2010 the National Marine Fisheries Service (NMFS) posted its notice of 90-day petition finding and notice of 12-month determination regarding a petition to revise critical habitat for the North Atlantic right whale to the Federal. The petition seeks to revise the existing critical habitat designation by expanding the areas designated as critical feeding and calving habitat areas for the North Atlantic right whale. Additionally, the petition seeks to include a migratory corridor as part of the critical habitat designation for the North Atlantic right whale. NMFS found that the petition presents substantial scientific information indicating that the requested revision may be warranted. NMFS will continue ongoing rulemaking process with the expectation that a proposed critical habitat rule for the North Atlantic right whale will be submitted to the Federal Register for publication in the second half of 2011 (<http://sero.nmfs.noaa.gov/pr/mm/rightwhales/RW%20CH/RW%20CH%202010-25214.pdf>).

- Right Whale Mitigation Strategy for Lobster Fishing Areas 36, 37, 38, Southwestern New Brunswick, Canada
 - o A communication system involving the exchange of information on whale aggregations by radio and telephone is in place in the Bay of Fundy to minimize risk of entanglement of whales in Lobster Fishing Area 36 and 37 (south-western New Brunswick) and LFA 38 (Grand Manan). The objective is to provide fishermen with information on the presence and position of whales so that they can avoid setting gear in proximity to the whales.

References

Pettis, Heather. North Atlantic Right Whale Consortium Annual Report Card (01 November 2007 – 30 April 2009). International Whaling Commission Annual Meeting, May 2009. Reference Document *SC/61/BRG1*.

Waring GT, Josephson E, Maze-Foley K, and Rosel PE, editors. 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2009. NOAA Tech Memo NMFS NE 213; 528 p.

Population Estimate Calculation

We have developed standardized criteria that can be applied each year to get a low, middle (best estimate) and upper number of whales in the population as determined from Catalog data. One term needs to be explained to understand these numbers. Whales are given temporary intermatch codes if 1) two or more sightings match each other, and 2) neither have been matched to a catalog whale. Some of these whales will eventually be matched to existing cataloged whales and others will be determined to be “new” to the Catalog and assigned a number. Once an intermatch whale is given a Catalog number, or matched to another intermatch code whale, the intermatch code is made inactive.

LOWER

To determine the lower bound, we simply count the number of unique cataloged whales identified the year before. Because of delays in processing data, this number is lower than the eventual total number of whales seen alive in that year.

MIDDLE

The middle bound is determined by summing three categories:

- 1) All whales presumed to be alive in that year (i.e. seen in the last six years),
- 2) Intermatch whales that are likely to be added to the Catalog. This is calculated by first finding all intermatch codes that span two or more years (both those that are active and those that were matched and made inactive), removing all calves and any SEUS whales whose sightings span two years only because they are seen in December and January of the same field season. Then, we determine which of those intermatch whales have Catalog numbers and what percent of those were new to the catalog (i.e. had not been matched to an existing cataloged whale). The remaining, unidentified intermatch whales are then multiplied by that fraction to determine how many are likely new to the Catalog (e.g. if only 20% of the matched intermatch whales were new, then 20% of the unmatched intermatched whales are likely new). That number is then added to the count of calves born more than two years earlier that are unmatched with active intermatch codes (indicating there is enough information to potentially match them in the future). Process changed Oct. 2009.
- 3) Calves from the last two years that have not been cataloged. We make an assessment of whether there is enough photographic information to match them to future sightings and thus assign them a Catalog number. We then sum those that will likely be cataloged.

UPPER

The upper bound is also the sum of three categories:

- 1) All Cataloged whales minus those whose carcasses were identified.
- 2) All active intermatch whales minus calves from the last two years.
- 3) All calves from the last two years minus those known to be dead.