

North Atlantic Right Whale Consortium 2012 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 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, and state authorities, the Canadian Right Whale Network, the U.S. Right Whale Implementation Teams, the Atlantic Large Whale Take Reduction Team, the Atlantic 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.

2012 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 cataloged 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 2012 annual report card includes information from 01 November 2011 – 31 October 2012.

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 of right whales in high use habitats and migratory corridors, including, but not limited to, the 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. Currently, survey efforts on the Scotian Shelf and Jeffreys Ledge are lacking and monitoring efforts of visual health assessment and scarring remain unfunded. The Board maintains that these are critical to right whale conservation and efforts to include these activities in future action and funding plans should be pursued.

Additionally, the Consortium Board regards the Consortium databases as essential to recovery efforts for the North Atlantic right whale population. In a review of the federal recovery program for North Atlantic right whales, the Marine Mammal Commission agreed with the Board’s sentiment, stating that “both databases play critical roles in right whale conservation” and that the Identification Catalog “is the cornerstone of right whale research and monitoring” (Reeves et al. 2007). The review went on to recommend that both databases (“both” here and above refers to the Identification and Sightings databases; there are several other Consortium databases available) be fully funded on a stable basis. Since that review, funding for the Sightings database in 2011 – 2013 was cut by half over the previous year and by two-thirds over the peak level in 2005. The Identification database has received annual budget increases of 3-4%, but on average, the number of sightings contributed annually has increased more than that. As a result, in high sighting years, identification processing falls farther behind. If the population continues to increase and survey effort remains stable, this will lead to an increasing problem in timely processing of data.

Pettis HM, Hamilton PK. (2012) North Atlantic Right Whale Consortium 2012 annual report card. Report to the North Atlantic Right Whale Consortium, November 2012.

Lastly, the Board notes that the Canadian Right Whale Network has not met since February 2011 which has hampered coordinated recovery efforts and effective communication for Canadian waters.

Population Status: 2011

Estimate of Cataloged North Atlantic Right Whales: 2011 (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 700,000 slides, prints, and digital images collected during the 60,985 sightings of 657 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 (data are currently completely processed through 2010) the most recent estimate of the cataloged population available is for 2011.

In 2011, the best estimate of catalogued North Atlantic right whales was 509 individuals (database exported 29 October 2012). 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 476 cataloged whales that were presumed to be alive in 2011 because they were seen in that year, or any time in the prior five years (Knowlton et al. 1994). The estimate also includes 20 calves from 2010 or 2011 that were considered suitable for eventual inclusion in the catalog and 13 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).

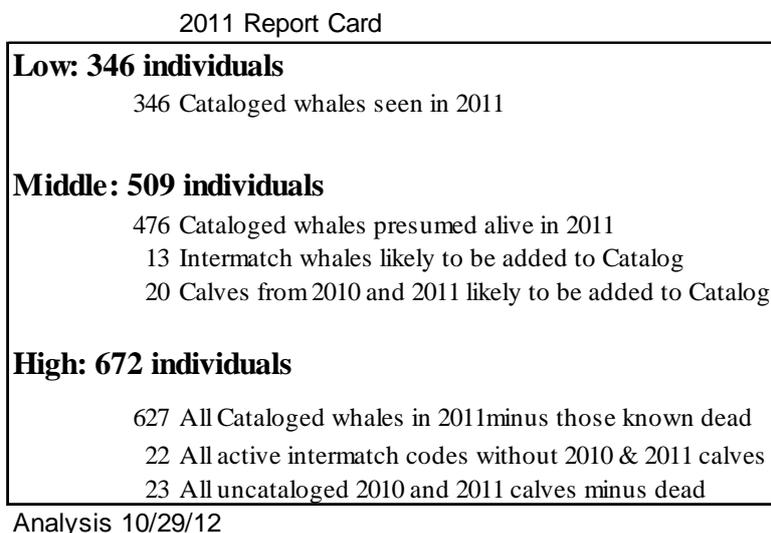


Figure 1. Estimates of the number of cataloged whales in the North Atlantic Right Whale Identification Catalog. A detailed explanation of calculations can be found at the end of this report.

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 counts whales that have been seen at least once in the last six years. It is a consistently measurable and easily available value, but is not an accurate estimate of recent cataloged population size due to delays in data processing. The Minimum Number Alive (MNA), which is the number used in the NMFS stock assessment reports, counts whales seen in a given year, plus any whale not seen that year but seen both before *and* after. The MNA number is also not accurate for recent years for the same reason as the presumed alive, plus the fact that there have been fewer “after” years to detect a whale. The report card number is the only number that assesses animals that are not yet cataloged and is the best number for the previous year.

For the graph below, all numbers were recalculated using data from October 29, 2012 except the report card from previous years. The report card numbers are always higher than the other two methods for the last two years. However, the fact that the old report card numbers for 2009 and 2010 now match the regenerated presumed alive numbers indicate that the report card method provides an accurate number, and is able to do so several years in advance of the other analyses.

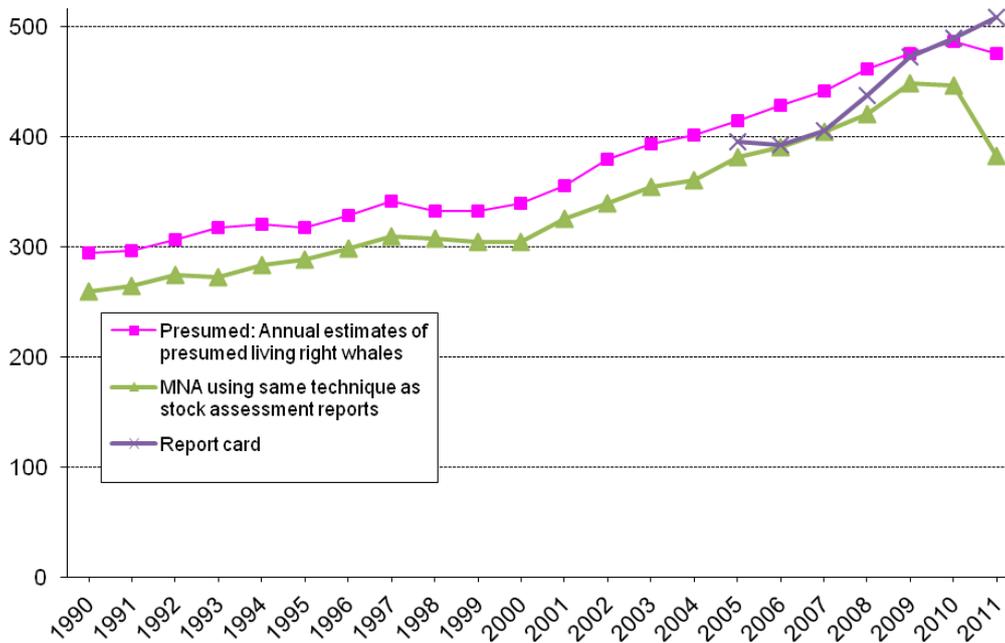


Figure 2. Assessments of the North Atlantic right whale population based on three available assessment methods.

Reproduction: 2012

7 calves were born this year.
 Average calving interval of 2012 moms was 5.4 years.
 There were two first time moms.

Mortalities

Between 01 November 2011 and 31 October 2012, three 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 2011 - 31 October 2012

Whale #	Date	Location	Sex	Age	Necropsy Field #	Cause	Comments
2012 Calf of #1301	Between 01/10/2012 and 01/24/2012	Florida	Unk	Calf	--	Unknown, calf exhibited signs of poor condition, including emaciation, prior to disappearance	First sighted on 12/20/2011. Seen with mother on 01/10/2012. Mother seen without calf on 01/24/2012. No carcass discovered.
--	03/02/2012	Floating off Cape Cod	Unk	Uunk	--	Unknown, sampled at sea	Head missing. Genetics sample obtained
--	07/19/2012	Nova Scotia	Female	Unk	Incident #86957	Necropsy performed. COD likely asphyxiation following underwater entrapment	350 meters of 1 inch diameter line wrapped around peduncle.

Pettis HM, Hamilton PK. (2012) North Atlantic Right Whale Consortium 2012 annual report card. Report to the North Atlantic Right Whale Consortium, November 2012.

Entanglements, Entrapments and Vessel Strikes

Entanglement and Entrapments:

There were 12 active entanglement/entrapment cases reported between 01 November 2011 and 31 October 2012. Of these, 7 were new cases and 1 resulted in a mortality. Table 2 includes these newly reported cases as well as pertinent updates to previously reported cases.

Table 2. Right whale entanglements and status updates 01 November 2011 – 31 October 2012. Newly reported entanglements (carrying gear) are bolded and those cases resulting in mortality are italicized.

Whale #	Date of First Entanglement Sighting	First location	Sex	Age (current)	Comments
3821	01/07/2012	Cape Cod Bay	Unk	4	Previously entangled in 2009. Resighted 01/26/12, 02/05/12, 02/15/12. Partial disentanglement.
1719	01/19/2012	20 miles NE Brunswick, GA	Female	Unk, adult	Line in mouth, attempted disentanglement. Resighted 01/20/2012, still entangled
3996	02/15/2012	Off Provincetown, MA	Unk	3	Resighted 04/13/12 and 09/09/12. Attempted disentanglement. Gear was constricting at last sighting.
Unk	05/15/2012	120 miles E Provincetown, Cultivator Shoals	Unk	Unk	Very few looks at whale; red material at right side of mouth. Not yet resighted.
3346	03-17-2004	2 miles E Anastasia Island, FL	Male	9	Gear remains on right flipper, resighted 01/10/12, 01/17/12, and 06/18/12.
3712	01/31/2011	9miles ESE of St. Augustine, FL	Unk	5	11/08/2011 sighting confirmed gear free
3302	04/22/2011	2miles east of Southern Wolf Island, Bay of Fundy	Male	9	11/09/2011 sighting confirms gear still present
3123	04/29/2011	off Billingsgate Shoal, Cape Cod Bay	Female	11	Re-sighted 02/15/2012, 03/20/2012, no gear visible but gear-free status cannot be confirmed
--	<i>07/19/2012</i>	<i>Nova Scotia, Canada</i>	<i>Female</i>	<i>Unk</i>	<i>Carcass discovered on beach. 350 meters of 1 inch diameter line wrapped around peduncle. Necropsy performed (Incident #86957). COD likely asphyxiation following underwater entrapment (see also mortality table)</i>
1708	08/25/2012	Grand Manan Island, New Brunswick Canada	Male	25	Trapped in a herring weir off Grand Manan Island, New Brunswick, Canada. Netting and top poles removed from weir on 08/26/2012. Whale remained in weir until 08/27/2012 when eight bottom poles were removed.
3111	09/27/2011	10 miles E of Grand Manan Island, BOF	Male	11	Re-sighted 03/04/2012, no gear visible but left flipper needs confirmation of no gear
3790	10/17/2012	Grand Manan Island, New Brunswick Canada	Unk	Unk	Trapped in herring weir off Grand Manan Island. Whale remained in weir for a day before bottom netting was removed and the whale forced its way out between the bottom poles.

Vessel Strikes:

Three right whales were sighted with new propeller wounds between 01 November 2011 – 31 October 2012 (Table 3).

Table 3. Newly reported right whales with propeller wounds 01 November 2011 – 31 October 2012.

Whale #	Date of propeller wound sighting	Sex	Age (current)	Description
1331	11/26/2011	Male	Unk (Adult)	Prop wounds on right side of body
2011 Calf of 2746	01/17/2012	Female	1	Prop wounds along left body. Acquired between 08/17/2011 and 01/17/2012
3701	03/04/2012	Unk	5	Minor prop marks along left side

Aerial and Vessel-based Sightings November 2011 – October 2012

Cataloged sighting information through 31 October 2012 is summarized below and includes survey, research, and opportunistic sightings. Months with sightings and major contributing organizations (>10% total sightings for region) are 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:

CC: Coastwise Consulting
FWRI: Fish and Wildlife Research Institute
MICS: Mingan Island Cetacean Society
NEAq: New England Aquarium
NEFSC: Northeast Fisheries Science Center
PCCS: Provincetown Center for Coastal Studies
S2S: Sea to Shore Alliance
WCNE: Whale Center of New England
WWFC: World Wildlife Fund Canada

Southeast United States (sightings: 415, December - March; FWRI, GDNR, S2S)

- Aerial surveys Biopsy darting and vessel based photo-ID

New England (sightings: 875, January – April, July - August, November - December; PCCS)

- Aerial surveys and habitat sampling

Jeffrey's Ledge (sightings: 90, January – February, September, November - December; NEFSC, WCNE)

- Aerial and vessel surveys

Great South Channel (sightings: 90, January – May, October; NEFSC, PCCS)

- Aerial surveys

Gulf of Maine (sightings: 178, January, March, May – June, August – September, November - December; NEFSC, NEAq)

- Aerial and vessel surveys

Bay of Fundy (sightings: 117, July - November; NEAq, CC)

- Vessel surveys
- Biopsy sampling

Mid-Atlantic (includes south of Cape Cod) (sightings: 118, January – April, August, November - December; PCCS, S2S, NEAq)

- Aerial surveys
- Vessel surveys

North (sightings: 8, August; all opportunistic; MICS)

East (sightings: 1, opportunistic; WWFC)

Roseway Basin (sightings: 14, May – June; NESFC)

- Aerial surveys

Partial Listing of Research Analyses Underway in 2012

- Investigating drivers of right whale hot spots.
- Right whale diving and foraging behavior
- Estimating survival and health of right whales using effort, sightings and body condition data
- Impacts of human activities on right whale reproduction
- Acoustic behaviour of right whale mother calf pairs
- Acoustic analysis of right whale habitats
- Mitigating risk to whales from lobster fishing.
- Sub-lethal impacts of survivability of entanglement
- Habitat modelling for right whales in the SEUS
- Examining timeframe of body condition decline in right whales
- Evaluation of right whale vision capabilities
- Investigating the effects of entanglement on right whale survival and reproduction
- Evaluating the efficacy of the Ship Strike Reduction Rule
- Swim speed, behavior, and movement of right whales in coastal waters of NE Florida

Management and Mitigation Activities

- NOAA encoded four small-scale electronic navigation charts (US2EC04M, US2EC03M, US2EC02M, and US2GC12M) with ship speed rule seasonal management areas (SMAs). The electronic navigation charts (ENCs) were posted on March 9 and are available for download and use. The SMAs, as encoded into the ENCs, graphically show the areas where vessels greater than 65 feet in length must travel at 10 knots or less to reduce the risk of collisions with right whales. The ENCs will also provide for an alarm on the ship's electronic chart display and information system as vessels enter the speed zone, further alerting the bridge watchstander of speed restrictions.
- The northern recommended lane used by ships transiting into and out of port in Brunswick, GA, was shifted slightly to accommodate shoaling. A risk assessment based on MSR-derived vessel tracks and a right whale habitat model suggested the shift would result in less than a 0.2% change in relative risk to right whales.
- NOAA's National Marine Fisheries Service (NMFS) intends to expand large whale conservation efforts by amending regulations that implement the Atlantic Large Whale Take Reduction Plan (ALWTRP). NMFS continues to develop ideas to reduce the risk of serious injury or mortality of large whales that interact with vertical lines (buoy lines) from commercial trap/pot and gillnet fishing gear. As part of that process, NMFS is developing an Environmental Impact Statement (EIS) and proposed and final rule. NMFS is committed to publishing a final rule to address vertical line entanglement by 2014.
- The Species at Risk Management Division of Fisheries and Oceans Canada (DFO) in Maritimes Region has prepared a draft Action Plan for the North Atlantic Right Whale in Atlantic Canadian waters. The outline of this document was developed based guidance DFO received during a meeting of the Right Whale Recovery Network in 2011. After further development of the draft and extensive review within DFO, external comments on the draft document are being sought (due 30 November 2012). Please contact Cathy Merriman (Catherine.Merriman@dfo-mpo.gc.ca) for more information.
- DFO has been developing a Protection Order under the Species at Risk Act that prohibits the destruction of any part of right whale critical habitat in Canadian waters.
- DFO Science is initiating a study to characterize vertical rope profiles under different parts of the tidal cycle, to understand what factors influence slack rope.
- DFO has been continuing its activities to reduce the likelihood of right whales encountering fishing gear, by continuing to support the Lobster Mitigation Strategy in Lobster Fishing Areas 36, 37 and 38. Efforts to train Fishery Officers to conduct disentanglements are continuing. DFO support for non-government response teams continues. The Maritimes Marine Animal Response Network will be meeting in December 2012.
- A partial right whale necropsy was conducted on a right whale in Nova Scotia in July 2012.

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*.

Reeves, Randall R., Andrew J. Read, Lloyd Lowry, Steven K. Katona, and Daryl J. Bonnes. Report of the North Atlantic Right Whale Program Review. 2007. Marine Mammal Commission. Bethesda, Maryland.

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.