RIGHT WHALE NEWS

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Right Whales in a Changing Sea: The New Challenge for Survival

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On 2 November 2016, at the annual meeting of the North Atlantic Right Whale Consortium, New Bedford, Massachusetts, several hundred attendees heard about issues and concerns for the species. (Photo: P Pereira, New Bedford Standard-Times*)*

In 1980, the North Atlantic right whale was believed to number fewer than 200 animals. Since that time, research teams from the New England Aquarium; the Center for Coastal Studies; the Woods Hole Oceanographic Institution; the U.S. National Marine Fisheries Service (NMFS); Trent University; Dalhousie University; the States of Florida, Georgia, and Massachusetts; and numerous colleagues in the North Atlantic Right Whale Consortium have studied the biology, population dynamics, and conservation threats to this species. Over this 36-year period, these

data have supported the NMFS, the Canadian Department of Fisheries and Oceans, and Transport Canada in collective efforts to identify and designate critical habitats, move shipping lanes away from right whales, slow ships in right whale habitats, and develop a variety of new methods to monitor right whale health. These widespread international efforts were rewarded with a slow but steady growth in the population until 2010.

From 2010 to the present, right whale seasonal distributions have shifted. Large reductions in whale numbers occurred in the summer Bay of Fundy and Roseway Basin habitats, and in the springtime Great South Channel habitat. During this same period, the early spring right whale habitat in Cape Cod Bay saw significant increases in numbers. New right whale aggregation areas were found off Nantucket in the winter and spring, and in the Gulf of St Lawrence in the summer. These distribution changes suggested that right whales were looking for food outside of their "normal" habitats.

There are two consequences of these movements and shifts in distribution. First, the searching for food increases energetic requirements, and if food is harder to find, female weight gain may be inhibited. As several of our scientific colleagues have shown, the loss of body condition or fat in female whales can delay or stop reproduction. The data from right whale calving indicates that this is happening. Annual calf production over the last five years (2012−2016) is 45% lower than during the previous five years (2007-2011).

Second, as right whales search farther afield for prey, the probability of entanglement increases. Fishing gear is widely distributed in both U.S and Canadian coastal waters. Therefore, the more a whale travels, the probability that a whale will encounter ropes in the water column increases. Ironically, the Bay of Fundy and the Roseway Basin habitats were both areas where fixed-gear fishing was fairly minimal during the summer and fall. As long as whales set up in those areas for extended periods (presumably due to stable and abundant copepod resources), their chances of encountering fishing gear were minimal. After 2010 though, right whales were scattered from Virginia to Quebec during the summers, and even when they were seen in the historical habitats, the sighting data indicated that their visitation was brief.

Right whale entanglements and mortalities in the Gulf of St Lawrence in 2015 and 2016 indicate that increasing conflicts with human activities are occurring there. NMFS mortality estimates for the U.S. and Canada combined indicate that an observed minimum of 4.3 right whales were killed (on average) annually by human activities from 2009 to 2013, mostly by fishing gear. Until 2009, 44% of diagnosed right whale mortalities were vessel strikes and 35% were entanglements. After 2010, 15% were vessel strikes and 85% were entanglements. Even if some whales survive their entanglements, a new analysis done by New England Aquarium researchers indicates that non-lethal entanglements can cause reproductive failure and declining health long after the entanglement has ended.

The beaching of a dead and entangled right whale on Sable Island on 1 September 2016 exemplifies the problem with fishing gear and right whales. (Photo: Parks Canada/Marine Animal Response Society)

In 2016, more right whales were seen in all habitats than in recent years, but the photographic and health data were disheartening. Many right whales had extensive skin lesions on their heads and bodies; others had large, fresh wounds from recent entanglements; and some had both. To summarize the season in no uncertain terms, six right whales were discovered seriously entangled in fishing gear during a six-week period in early autumn: two of them were dead, and the long-term fate of the others is in question. At the conclusion of 2016, it is apparent to most right whale biologists that right whales cannot sustain this level of injury and mortality from fishing gear if they are to survive in the western North Atlantic.

Experience tells us that a species can disappear over relatively short timeframes. *National Geographic News* reported that the Chinese river dolphin, nicknamed "the goddess of the Yangtze," is now functionally extinct. This conclusion is according to scientists who could not find a single one of these animals during a six-week search on the Yangtze River. Similarly, the U.S. Marine Mammal Commission describes that the northern Gulf of California vaquita is in precariously low numbers (fewer than 60 individuals), and has initiated new research efforts. And lastly, the Caribbean monk seal (due to hunting and overfishing) went extinct in the 1950s. The threat is real.

The asymmetry of experience between fishermen and whales has made this an extraordinary conservation challenge. Extremely few fishermen encounter right whales, but nearly all right whales have been entangled in fishing gear. Thus, most fishermen can legitimately say they have never seen, nor entangled, a right whale in their gear, and are therefore perplexed if they are asked to adjust fishing methods or gear to solve a problem they do not experience. On the other hand, an average of 66 right whales are entangled in fishing gear annually. Overall, 83% of the catalogued right whale population has been entangled at least once, and 59% of those whales have been entangled at least twice. Thus, we are confronted with both a threat to population viability for right whales, and a cultural issue, where a majority of the fishing community is not convinced there is a problem.

The combined factors of reduced reproduction and increased mortality from human causes create double jeopardy for right whales, turning a population recovery into a slow population decline. However, there are actions that can reverse these trends. Fishing gear modifications now exist to both prevent and reduce entanglement severity. New technology exists for fishing with reduced breaking-strength ropes that are less likely to kill whales if they get entangled. For offshore gear, where low-strength rope will be ineffective, there are ropeless fishing alternatives, borrowing technology from the oceanographic engineering community. In some places and times, temporary fishery closures will be necessary. We should view these closures as opportunities for the science and engineering communities to help fishermen fish in those areas with gear that cannot kill whales. Ultimately, to save right whales, our long-term goals must be to ensure the survival of both whales and fishermen.

Fishing groups need to be engaged in constructive dialog and experimental approaches to solve this problem, and it is certain that there is not a one-size-fits-all solution. The assistance of Canadian and U.S. managers in both regulatory and scientific efforts is essential. Solutions will come from an approach that includes fishermen, gear technologists, biologists, and fishery managers; is based upon good science; and is focused on relevant fisheries, whale movements, injuries, and mortalities; and fishing gear technology and operations. The extinction of right whales from ocean industrialization would be illegal, immoral, and achingly sad. The North Atlantic right whale deserves our best efforts to ensure that does not happen.

524: The Story Behind the Number

On 2 November 2016, at the annual meeting of the North Atlantic Right Whale Consortium, Philip Hamilton provided the Annual North Atlantic Right Whale Report Card. The number of most interest was 524—the “best” population estimate based on the number of individual photographed whales in the Catalog. (Recall that this current estimate is for the number of whales at the end of 2015.) What appeared to have been a slow but steady increase in the

estimate during the past two decades has stalled. In 2014, the estimate was 526, and in 2013, 522. The numbers have essentially plateaued.

Other analyses reinforce the concern. Richard Pace at the Northeast Fisheries Science Center reported that previous analysis indicated that the number of catalogued right whales known to be alive in any year increased at approximately 2.8% per year from 1990 to 2011. However, a recently developed mark-recapture model indicates that this increase has leveled out. Based on this model, the 2015 population estimate (for 2014) for North Atlantic right whales is 469 (with a 95% highly credible range of 457−480). Further examination of the abundance estimates indicates a 99.88% likelihood of a population decline from 2011 to 2015 when median growth from that period was 0.958 (95% credible interval: 0.935−0.981), or about a 4% decline.

Hamilton described several interrelated contributing factors: 1) there has been a distribution shift beginning around 2011, 2) a larger percentage of reproductive females are not calving in a given year, 3) a larger number of calves are not being photographed and entered into the Catalog, and 4) the "six-year standard" for identifying unseen whales as no longer alive may be too long for some whales. Hamilton described that there formerly were 3000−4000 sightings per year, but in 2015−16 there were just 1600−1800. As described previously, sightings of juveniles have decreased. (The complete 2016 Report Card is available at www.narwc.org.)

Pace concluded that model-based estimates indicated that a 2.8% per annum increase in right whale abundance observed during 1990−2011 has turned into a likely slow decline in 2012−15. It will likely take a large turn-around in future calf production to get right whales back on track to recovery.

Entangled Right Whale near New York City

Contributed by Paul L. Sieswerda, Gotham Whale

Sunday, 4 December 2016, was the last scheduled cruise of the M/V *American Princess*, a whale watching boat out of Rockaway, Queens. It marked the end of the 2016 season. The schedule was extended a month longer than the usual trips in previous years because of the many whales that were still in the area. On this day we encountered our first North Atlantic right whale. Captain Tom Paladino had seen right whales in his days off Cape Cod but neither Captain Frank DeSantis, our naturalist Catherine Granton, nor Gotham Whale photographer Artie Raslich had ever seen a right whale in anything but illustrations. On encountering the whale, it was not like our usual humpback sightings. The blow was different and Captain Tom said, "I think I see a V." As Artie examined his photographs with the captains in the wheelhouse, it was clear that this was a North Atlantic right whale. The location was 3 miles south of Rockaway Beach, just outside the entrance to New York Harbor.

Right whale Catalog #3405, Fuse*, off Rockaway Beach on 4 December 2016. (Photos: A. Raslich)*

Closer examination of the photos revealed that gill netting and line were wrapped around the whale's body. The captains immediately notified the Disentanglement Network at the Center for Coastal Studies (CCS) in Provincetown, Massachusetts. The *American Princess* tried to keep the whale in view, but it was moving rapidly, and they lost sight of the whale. Through the Network's Scott Landry and David Morin of NOAA, the USCG and relevant agencies were alerted. Our photos were promptly sent to CCS to assess the entanglement. Gotham Whale sent out a "heads-up" to our colleagues in New York: CRESLI, Riverhead, and WCS. After searching further for the whale, the *American Princess* returned to port.

Subsequent to the encounter, we learned that the Coast Guard conducted a dedicated search the next day, but was unable to locate the animal. Photo identification was possible and it was determined that the whale was NARW Catalog #3405, a calving female known as "Fuse". Scott Landry, CCS, reported that due to the lateness of the day, no disentanglement effort was initiated. And, because there have been no further sightings of this individual, it is guessed that she is still carrying the gear. *Fuse* was last seen in the Bay of Fundy on 15 August 2016. She was not entangled at that sighting.

Of note is the relative proximity of this sighting to the main shipping channels at the entrance to the port of New York/New Jersey. Gotham Whale often records humpbacks feeding next to the large container ships, car carriers, and tankers that enter the busiest port on the East Coast daily. The number of humpbacks has increased substantially since 2011. If right whales follow a similar track, the area will be a major concern for the species as New York Harbor is gearing up for the expansion of mega-ships soon to be entering the port.

For further information: www.gothamwhale.org.

News Bytes

Block Island Windfarm. The first offshore windfarm in the United States went operational on 12 December 2016. See also *Right Whale News*, September 2016, and www.dwwind.com.

Best Practices Workshop. The Bureau of Ocean Energy Management (BOEM) will host a three-day "Best Management Practices Workshop for Atlantic Offshore Wind Facilities" on 7–9 March 2017. The workshop will take place at NOAA Fisheries, Building 4 (Science Building), 1315 East-West Highway, Silver Spring, Maryland. Additional workshop information, including a draft agenda, will be available at: http://www.boem.gov/Public-Engagement-Opportunities.

NOAA Fisheries 2017 Plan. The "high-level action items for 2017" are given in *Fisheries Priorities and Annual Guidance for 2017*. Currently, the Recover and Conserve Protected Species/Species in the Spotlight item does not include North Atlantic right whales. For the full report, see: www.nmfs.noaa.gov/aboutus/docs/fisheriespriorities2017.pdf.

Calendar

5–7 April 2017. Annual meeting of the Marine Mammal Commission. Location in or near Woods Hole, Massachusetts. North Atlantic right whales will be on the agenda, among other topics. Additional details will be provided in the next issue.

23−27 October 2017. 22nd Biennial Conference on the Biology of Marine Mammals. Halifax Convention Center, Halifax, Nova Scotia, Canada. The 2017 NARWC Annual Meeting will be held on 22 October 2017 at St. Mary's University, Halifax, Nova Scotia, Canada. Additional details will be in future issues of this newsletter.

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