Right Whales in the Gulf of Maine

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Right Whale 5-Year Review

• A Requirement of the Endangered Species Act; follow-on from the North Atlantic Right Whale Recovery Plan

• Findings of the 2017 5-year review:
  • A low rate of reproduction,
  • Longer calving intervals,
  • Declining population abundance,
  • Continued mortality from vessel and fishing gear interactions,
  • Changes in prey availability, and
  • Increased transboundary movement and risk.

• Confirms endangered status
Source: Pace et al. 2017
Total mortality calculated from Pace et al. 2017

- Annual mortality (5-year average)

- Detected mortality and serious injury
- Missed mortality

NOAA FISHERIES
Source: Knowlton et al. 2016
Entanglement levels
3 injury severity levels
(based on extensiveness and depth of wounds)
+
With or without attached gear
=
6 levels
Number of Right Whale Cows Available to Calve (blue line) vs % of Cows that Successfully Calved (red line)

- **Known cows available to calve**
- **% of those cows that did calve**
- **Trend in # of Cows Available to calve**
- **Trend in % of Cows that Successfully Calved**
Source: P. Corkeron, NOAA Northeast Fisheries Science Center
Fig. 1. (a) A North Atlantic right whale (EG# 3911) in good health observed on 10 February 2010 (Photo credit: Florida Fish and Wildlife Conservation Commission, NOAA Permit No. 775-1875). (b) The same right whale, observed on 15 January 2011, in poor health after a severe fishing gear entanglement that resulted in her death (Photo credit: Georgia Department of Natural Resources, NOAA Permit No. 932-1905/MA-009526). Poor body condition was evident from concavity in the dorsal profile in the post-blowhole area (denoted by white arrow), skin lesions and widespread orange cyamid coverage (yellow circles), orange cyamids along the margins of the blowholes (white circle), and rake marks anterior to the blowholes (yellow arrow). A white fishing line can be seen exiting the margin of the lips next to the yellow circle on the left.
Source: Rolland et al. 2016
Entanglement is a costly life-history stage in large whales

Julie van der Hoop | Peter Corkeron | Michael Moore

Abstract
Individuals store energy to balance deficits in natural cycles; however, unnatural events can also lead to unbalanced energy budgets. Entanglement in fishing gear is one example of an unnatural but relatively common circumstance that imposes energetic demands of a similar order of magnitude and duration of life-history events such as migration and pregnancy in large whales. We present two complementary bioenergetic approaches to estimate the energy associated with entanglement in North
- Health declines as entanglement severity increases
- The health of reproductively active females is disproportionately affected by entanglements
- Plays a significant role in reducing calving rates

Source: Knowlton et al. in press
Recent Right Whale Mortalities

- 12 whales from June 7 – September 15, 2017 in the Gulf of St. Lawrence, Canada
  - 7 necropsies completed
    - Causes of death: 2 entanglement, 4 blunt force trauma, 1 unknown
- 5 whales from April 13 – November 26, 2017 near Massachusetts, USA
  - 4 necropsies completed
    - Causes of death: 2 pending, with evidence of entanglement, 1 blunt force trauma, 1 unknown
- 2 dead right whales observed in US waters in 2018
Right Whale Ship Strike Reduction under the Endangered Species Act
Traffic Separation Scheme into Boston

- In 2007, rotating the scheme 12 degrees to the north may reduce risk of ship strikes to endangered right whales by 58% and to all baleen whales by 81%.
- Right whale sightings over a 24 year period were analyzed.
- Transit time were estimated to increase from 9-22 minutes.
- In 2009, TSS into Boston was also narrowed – each lane reduced from 2 miles to 1.5 miles wide.
Ship Speed Rule

- Since 2008, a two-part strategy of Seasonal Management Areas (SMAs) and Dynamic Management Areas (DMAs)
- Seasonal Management Areas:
  - Mandatory 10-knot speed restrictions for vessels 65 feet in length or greater on the US East Coast
- Dynamic Management Areas:
  - Voluntary, 15-day speed restriction areas triggered by 3 or more right whales
Migratory Route & Calving Grounds
November 1 through April 30

Mid-Atlantic Seasonal Management Areas

- Ports
- Mid-Atlantic Seasonal Management Areas (mandatory 10 knot speed restriction)
Calving and Nursery Grounds
November 15 through April 15

Southeast U.S. Seasonal Management Area

- O Ports
- Mandatory Ship Reporting Area
- SE Seasonal Management Area
Atlantic Large Whale Take Reduction Plan under the Marine Mammal Protection Act
Atlantic Large Whale Take Reduction Team

• Established in 1996 under MMPA
  • **Purpose:** to develop a take reduction plan for reducing the incidental take of right whales, humpback whales, fin whales and minke whales in commercial trap/pot and gillnet gear in U.S. waters from Maine to Florida
  • **Goal:** reduce serious injuries and mortalities to < PBR (PBR=0 for Right Whales at that time)
## Team Membership

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trap/Pot Industry</td>
<td>18</td>
</tr>
<tr>
<td>Gillnet Industry</td>
<td>5*</td>
</tr>
<tr>
<td>Conservation/Environmental</td>
<td>6</td>
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<tr>
<td>Academic/Scientific</td>
<td>9</td>
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<td>State Managers</td>
<td>14</td>
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<tr>
<td>Federal Managers</td>
<td>5</td>
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<tr>
<td>Fishery Mgmt Organizations</td>
<td>4</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>61</strong></td>
</tr>
</tbody>
</table>

* Some trap/pot member represent gillnet as well
July 22, 1997
- Establish TRP
- Weak link requirements
- Effective November 15, 1997

January 9, 2002
- Establish SAM and DAM program
- DAM effective February 8, 2002
- SAM effective March 2002

October 5, 2007
- Expand weak link requirements
- Implement sinking groundline requirements
- Effective April 2009
- Replaced SAM and DAM program

December 12, 2014
- Modification to time/area of closure area
- Effective immediately

December 2000
- Gear marking requirements
- Effective February 2001

June 25, 2007
- Seasonal gillnet closures in Southeast
- Effective July 2007

June 27, 2014
- Vertical line rule
- Additional gear marking requirements
- Effective June 2015

May 28, 2015
- Modification to vertical line rule.
- Effective immediately
- Additional gear marking requirements
Weak Links and Gear Marking

• Weak links are required coastwide

• Gear marking is required coastwide
  • Including two areas of importance for right whales with specific marks (Jordan Basin and Jeffreys Ledge)
  • 4,008 vessels are required to gear mark with three 12” marks
Trap/Pot and Gillnet Closure areas

31,916 TOTAL SQ MILES of seasonal closures

MA Restricted Area (trap/pot, Feb-April)
  • 3,073 sq mile

Great South Channel (trap/pot and gillnet, April-June)
  • 3,232 sq mile

Cape Cod Bay Restricted Area (gillnet, Jan-May)
  • 664 sq mile

Southeast Restricted Area North (gillnet, Nov 15- April 15)
  • 21,996 sq mile

Southeast Restricted Area South (gillnet, Dec-March)
  • 2,951 sq mile

NOAA FISHERIES
TRT Activities in 2018

**Planned:** Fall 2018 Full TRT meeting to consider measures that may be necessary to reduce the effects of gillnet and trap/pot gear entanglements on right whales

**Ongoing:** Two TRT Subgroups investigating the feasibility of:
1. Ropeless fishing
2. Whale release rope & gear marking
1,700 lb. Breaking Strength Rope

Source: Knowlton et al. 2016
1,700 lb. Breaking Strength Rope

Source: Knowlton et al. 2016
Ropeless Fishing

Figure 4. Trap recovery methods, including (top) bottom-stowed rope, (middle) variable buoyancy traps, and (bottom) docking system.

Source: Baumgartner *et al.*
TRT Subgroups

Focused on feasibility

1. Technological feasibility: Does the tech exist?
2. Functional feasibility: Will it work?
3. Economic feasibility: Is it cost-effective?
Questions?

Image collected under MMPA Research permit number 17355
Photo Credit: NOAA/NEFSC/Christin Khan