



Starboard, a female right whale, died off Canada's coast after dragging snow crab traps for days.

NOAA/NEFSC/PETER DULEY

The North Atlantic right whale faces extinction

By [Elizabeth Pennisi](#) Nov. 7, 2017 , 5:40 PM

HALIFAX, CANADA—In a sad reversal of fortune, the North Atlantic right whale is in deep trouble again after rebounding in recent decades from centuries of hunting. Recent population trends are so dire that experts predict the whale could vanish within 20 years, making it the first great whale to go extinct in modern times.

At a meeting of the Society for Marine Mammalogy here last month, whale experts reported that roughly 100 reproductively mature females remain, but they are not living long enough or reproducing quickly enough for the species to survive. Ship strikes have long been a threat, and fatal entanglements in commercial fishing gear are taking an increasing toll. And researchers have found that even when an entangled female doesn't die, dragging ropes, buoys, or traps can exhaust her, making her less likely to reproduce.

“It's going to take a bold effort on the part of everyone involved” to save the species, says Ann Pabst, a functional

morphologist at the University of North Carolina in Wilmington. “We have to redouble our efforts.”

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Eubalaena glacialis, the North Atlantic right whale—so-called by 18th century whalers because it was easy to kill and rich in valuable blubber—is one of three right whale species. It is found along North America’s east coast, breeding in the winter in waters off of Florida and migrating to summer feeding waters off New England and northeastern Canada. Its accessible habitat has made it one the world’s best documented large whales. But its range is also in one of the most industrialized stretches of ocean in the world, crowded with threats including ships, fishing operations, and energy infrastructure.

Over the past few decades, right whale numbers appeared to be slowly climbing, from roughly 300 to about 500.

Governments helped it along by **taking steps to prevent ship strikes**, such as imposing speed limits on or rerouting larger vessels in some waters, and installing sensors that can warn mariners when the whales are nearby.

Entanglement, however, appears to be taking a growing toll because of increased fishing in areas where the whales are foraging. Forty years ago, “I didn’t really accept that entanglement was a big threat,” says Randall Reeves, a marine conservationist based in Hudson, Canada, who chairs the scientific advisory committee of the U.S. Marine Mammal Commission in Washington, D.C. “But now it’s blindingly obvious.”

By tallying field reports and rope scars found on whales,

researchers have concluded that about 50 North Atlantic right whales become tangled each year, and about 83% of all whales have gotten caught at least once. Entangled whales often drown or die from starvation or injuries; overall, 58% of the right whale deaths since 2009 were due to entanglements, a big jump from 25% between 2000 and 2008, says marine mammalogist Scott Kraus of the New England Aquarium in Boston.

Even if entangled whales don't die, they can pay a big physiological price. At the meeting, Canadian marine biologist Julie van der Hoop of Aarhus University in Denmark told the tale of a male named Ruffian who became entangled in a snow crab trap off Canada sometime between August 2016 and January 2017. He dragged 138 meters of rope and a 61-kilogram trap all the way to Florida, where he was disentangled. By attaching force sensors to gear recovered from entangled whales and dragging it through the water, Van der Hoop and colleagues have found that lines wrapped around a whale's fins and body can increase drag by 160%; towing a lobster trap more than doubles the load. She calculates that Ruffian's burden forced him to burn an extra 27,000 calories a day during his trip, which would explain why he was noticeably thinner by the time he was disentangled.

Ruffian survived, but his experience aligns with data Van der Hoop and colleagues reported in 2016 in *Ecology and Evolution*. By measuring blubber thickness on dead right whales—both entangled and not entangled—they found that entangled juvenile whales lose an average of 50% of their blubber, whereas entangled adults lose about 17%. The lost energy can approximate the amount a whale needs for its annual migration; to compensate, it would need to feed an extra 1 to 2 hours a day. In females, Van der Hoop believes such stress is contributing to longer intervals between calving. Even nonlethal entanglements are “exceptionally costly and [the effects] can last for years,” she says.

The whales' exposure to such dangers has increased since

2011, when **dozens began showing up in the Gulf of St. Lawrence in Canada**. Biologists believe the whales are following a main prey, small invertebrates, northward. But few of the measures that protect whales farther south have been adopted in these waters. This past summer 12 whales died in Canada, including at least six killed by ships or entanglement, which forced Canadian officials to take emergency measures, including closing fisheries. (Four more died in U.S. waters.)

The deaths and reduced reproduction have helped reverse encouraging population trends. The population likely peaked in 2010 at 483, including 200 females, according to a recent reanalysis of data from 1990 to 2015 done by a team led by Richard Pace of the National Oceanic and Atmospheric Administration's Northeast Fisheries Science Center in Woods Hole, Massachusetts. Today, the overall population has fallen slightly, to 450, but more females are dying than males, Pace found, possibly because reproduction already stresses them, making them less resilient to other impacts. What's worse, the females are having young just every 9 years or more, compared with every 3 years in the 1980s, Kraus says. That is causing the overall population to dwindle.

Curbing entanglements won't be easy. Technological fixes—including the use of weaker ropes for lobster and crab traps that would allow whales to break free, and electronically controlled traps that don't require lines at all—would be costly and difficult to implement. “There needs to be a paradigm shift in the fishing industry,” says Amy Knowlton, a whale expert at the New England Aquarium. No one wants to see the right whale go extinct, she says, but economic considerations may get in the way unless the government steps in.

But there isn't much time to act, warns marine ecologist Mark Baumgartner of the Woods Hole Oceanographic Institution in Massachusetts. He estimates that “we have years, not decades, to fix this problem.”



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