

Where Did the Right Whales Go?

New evidence suggests that the endangered population lost much of a critical food source, but may be stabilizing slightly as it shifts territory to feed elsewhere.

By Karen Weintraub May 23, 2019



A North Atlantic right whale breaching in waters off New Brunswick, Canada.

Credit Francois Gohier/Science Source

Something happened to the population of North Atlantic right whales in the last decade, as their numbers shrank and fewer calves were born.

Scientists had long speculated that a change had occurred in the whales' sources of food. By 2017, only 411 animals were counted, down from 482 in 2010. A paper published this month in the journal *Oceanography*, links warming in the Gulf of Maine with the life cycle of the copepod *Calanus finmarchicus*, a tiny shrimplike creature that forms the foundation of the right whale diet.

Although it is hard to prove cause and effect, the paper's lead author, Nicholas Record, said the study connected "the big ocean-scale climate changes" in the North Atlantic with the water coming into the Gulf of Maine and the whale's food resources.

"All of these pieces lined up together really well," said Dr. Record, senior research scientist at the Bigelow Laboratory for Ocean Sciences, a nonprofit institute in Boothbay, Maine. "It was really kind of stunning."

An influx of warm water near the ocean floor in 2010 significantly reduced the abundance of the shrimplike creature in the Gulf of Maine that summer and fall. Warmer water would have brought in fewer *Calanus* and also meant that more died and were eaten earlier in the season, Dr. Record said, leaving less food, "right when right whales need their last big meal before winter."

The whales followed the *Calanus* populations elsewhere, including to Cape Cod Bay and to the Gulf of St. Lawrence in northern Canada. Their shift in location may have created even bigger problems for the overall population, when they might have been hungry and moved to places with heavy shipping traffic.

North Atlantic right whales live off the East Coast of the United States and Canada, heading north during warmer weather and south during the winter. Many summer off New England and points north; their calving grounds are off the coast of Florida and Georgia.

“We’ve planned all these conservation measures around areas where we have known the whales to show up at the same time each time of year,” Dr. Record said. “When they stop showing up in those areas, and start showing up where protected measures aren’t in place, that’s when the problem starts.”

In 2017, 17 right whales died, including 12 in Canada, mainly as a result of being struck by ships or caught in fishing lines; three more stranded in 2018. Eighty-five percent of right whales have been entangled in fishing lines, according to data from the National Oceanic and Atmospheric Administration (NOAA).



The copepod calanus finmarchicus form the base of the foodweb in the Gulf of Maine, providing a food source for herring, mackerel and right whales.

Credit Gregory Rec/Portland Press Herald, via Getty Images

Shipping lanes and fishing locales are designed around traditional feeding grounds for the whales. But as those shifted, the whales came into more contact with boats and nets. And perhaps because the whales were undernourished, only five new calves appeared in 2017 and none in 2018, according to NOAA data. This year, seven calves have been sighted, which scientists hope signals that the whales have found new feeding waters and are sufficiently healthy to begin rebounding.

The shift in habitat has caused problems for lobstering in Cape Cod Bay, where the whales have been spending more time. Since December, whale researchers counted 267 right whales in Cape Cod Bay — roughly 60 percent of the known population, said Charles Mayo, a co-author on the new paper and the director of the Right Whale Ecology Program at the Center for Coastal Studies in Provincetown, Mass.

While the concentration has been a great boon for whale watchers, it has put tremendous strain on the local lobster industry, and boaters are limited to speeds of 10 knots (about 12 miles per hour) within the bay.

Massachusetts recently extended the closing of Cape Cod Bay to lobstering, but protests had forced the state to rescind the measure.

“The most draconian right whale conservation restrictions in place anywhere is right here in Massachusetts,” Beth Casoni, executive director of the Massachusetts Lobstermen’s Association, said at a rally on May 9. “It’s frustrating to the fleet” in Cape Cod Bay, which number about 100, she added by email, “as there are thousands of fishermen fishing to the north.”

Canada, which had not seen a lot of right whales north of the Bay of Fundy, had experienced an uptick, too, in recent years.

If whales are going to the Gulf of St. Lawrence in Canada to search for food, they are swimming as much as 700 to 800 additional miles, which means they will need to eat more to stay fully nourished, said Sean Hayes, protected species branch chief with NOAA in Woods Hole, Mass., who was not involved in the new study.

Right whale sightings were uncommon in the Gulf of St. Lawrence before 2017, said Catherine Brennan, of the Ocean and Ecosystem Sciences Division of Fisheries and Oceans Canada. But about 130 individuals were identified in the gulf last year.

Although they congregate in the southern part of the gulf, they have been crossing major shipping lanes, which puts them at risk, according to Catherine Johnson, a biological oceanographer who was a co-author on the paper.

Canada has imposed lower boat speed limits, restricted some fishing around shipping lanes and fishing areas, and added aerial and acoustic surveillance to try to better understand where the whales are congregating, said Hilary Moors-Murphy, research scientist for the Maritimes Region whale research program at Fisheries and Oceans Canada.

With just about one-third to half of all of the whales seen in Canada in recent years, researchers are unsure where the others are.

Dr. Mayo's staff flies daily over Cape Cod Bay, and crosses it in boats, scouring for whale activity. Now that some right whales are diving deeper to feed off a species called *Pseudocalanus*, they're harder to spot, Dr. Mayo said.

To combat entanglement in fishing lines, NOAA has been working with the fishing industry and inventors to experiment with lobster pots that are not connected by rope to buoys at the surface, Dr. Hayes said.

Sound can also put whales under additional stress, he noted. When shipping off the East Coast was temporarily halted after Sept. 11, and the ocean quieted, whale stress levels dropped precipitously, according to a 2012 study led by researchers from the New England Aquarium.

The right whales in the southern Atlantic have fared much better than their northern counterparts, enjoying a habitat where it is calmer and there is less contact with fishermen's ropes or ship traffic, according to NOAA research.

"Those animals have been recovering since the end of commercial whaling to the point that they're giving birth to more calves every year than we have North Atlantic right whales," Dr. Hayes said, adding that almost no adults have been known to die in those populations for at least 70 years. "It shows you what the potential of the population is."

<https://www.nytimes.com/2019/05/23/science/right-whales-endangered.html>