A Right Whale Movement: Mirroring Change

by **REANNE HARVEY** /// EAC Volunteer
PHOTOS by **NICK HAWKINS**

In 2017, the Gulf of St. Lawrence witnessed an unprecedented North Atlantic right whale mortality event.

Twelve whales lost their lives and another five were seen entangled in fishing gear, alive and struggling, by at-sea observers. Upon examination of seven of the dead whales, veterinary experts with the Canadian Wildlife Health Cooperative determined the leading causes of death were blunt force trauma and drowning. The former is a common fate when a whale is struck by a transport ship, the latter when a whale becomes so entrapped in fishing rope it can't escape to the surface for air. These necropsies confirmed what many already feared: the whales were colliding head on with Gulf fisheries and maritime waterway traffic.

For one of the most endangered whale species in the world, with an estimated global population of 411 and far fewer breeding-age females, an event of this magnitude was, and remains, extremely worrisome.

North Atlantic right whales (*Eubalaena glacialis*) were once common in the temperate waters of the North Atlantic, until the species was driven to the brink of extinction by intense whaling pressures. A League of Nations agreement banned their hunting in Canadian waters in 1935, but the population still struggled to recover.

Ship strikes and entanglements are now the leading causes of death for North Atlantic right whales each year. Historically, this migratory species has spent April to November feeding in or near the Bay of Fundy before heading back to U.S. waters in the winter months. But in recent years, the whales have been appearing less frequently in the Bay of Fundy, instead travelling north to feed in the Gulf of St. Lawrence.

This change in migration patterns may be linked to climate change. The primary food source of the North Atlantic right whale is the copepod (*Calanus finmarchicus*), a tiny and abundant zooplankton species, no bigger than the tip of your pen. Scientists are observing a decrease in the population density of this vital species with increased temperatures, particularly in its southern range, from the Chesapeake Bay to the Bay of Fundy. Right whale feeding grounds appear to be mirroring the northward movement of their food, leading the whales into areas of high fishing and shipping activity where mitigation measures are not in place. It was these shifting patterns that led to the devastating fatalities of 2017.

The iconic whales were not the only ones to suffer as a result of these changes. Fishermen and processing plants throughout coastal New Brunswick were affected, too. The 2017 entanglement incidents led the Marine Stewardship Council to suspend the Southern Gulf snow crab fishery's sustainability certification. United States lobby groups also threatened Canada with a call to ban all Atlantic Canadian snow crab imports if the fishery continued to harm right whales. Both of these measures held major implications for the export-based fishery, which relies on U.S. markets for 70 per cent of its sales.

The Canadian government took the situation very seriously. For the 2018 season, Fisheries and Oceans Canada (DFO) implemented emergency measures to reduce the risk of whale entanglement. Gulf snow crab fishermen had to observe a new static closure area, overlapping a right whale hotspot just east of New Brunswick's Lamèque Island, as well as temporary closure areas that came into effect for 15 days at times when right whales were spotted. The static closure's "no-fishing zone" covered an area where 20 per cent of the previous year's crab quota had been caught. The fishing season was also compressed, ending two weeks earlier than usual, to minimize interactions with right whales in the area.

As a result, fishing intensified outside of the closed areas and harvesters struggled to reach their catch quota, spending longer at sea in unfamiliar areas to find new fishing grounds. An unpredictable crab supply meant less work for processors too. Corporate seafood buyers, responsible for cross-border trade with the United States and elsewhere, faced a new challenge getting lucrative snow crab exports to market in a stunted fishing season.

While there was resistance to the new regulations from some fishing fleets, most fishermen came together in collaboration with researchers and environmental organizations to act swiftly and do what was necessary to stay on the water and fish while also avoiding the whales. Many were part of entanglement rescue efforts as well. Now, some fishermen are piloting new gear types to reduce potential harm to whales and other marine mammals going forward.

1. Meyer-Gutbrod, E.L., Greene C.H., and Davies. K.T.A. 2018. "Marine species range shifts necessitate advanced policy planning: The case of the North Atlantic right whale." *Oceanography* 31(2):19–23. Accessed February 8, 2019.
2. Grieve, B.D., Hare, J.A., & Saba, V.S. 2017. "Projecting the effects of climate change on *Calanus finmarchicus* distribution within the U.S. Northeast Continental Shelf." *Scientific Reports* 6264 (April). Accessed February 12, 2019.
3. Fahmy. G. 2018. "Crab fishermen struggle as season begins under strict new regulations." CBC (May). Accessed February 8, 2019.
4. Fisheries and Oceans Canada. 2019. "Fisheries Management." Last edited 02-08-19. Accessed February 12, 2019.
5. IPCC. 2018. Summary for Policymakers in Masson-Delmotte, V. et al., *Global Warming of 1.5°C. An IPCC Special Report*. Cambridge University Press, Cambridge.

In 2018, there were no known North Atlantic right whale deaths in Canada, likely due in large part to the strict mitigation measures. Still, at least five entanglement incidents occurred in Canadian waters during the summer, and two dead whales were found in American waters. In that context, all parties remain on high alert for right whale populations continuing to navigate new areas of the busy Northwest Atlantic.

For the 2019 fishing season, DFO has announced similar fisheries closure measures to accompany increased right whale monitoring and gear technology innovation – support that aims to continue to reduce entanglements. But ultimately, shifting ocean patterns are becoming harder and harder to predict. The future of the North Atlantic right whale is still unclear. As temperatures continue to rise, similar tales are likely to become increasingly common, with the consequences of climate change reaching further and impacting marine species and socioeconomic systems everywhere.

"Right now, the right whales are the hot-button species, and so they should be," says Shannon Arnold, Marine Coordinator at the Ecology Action Centre. "But who knows what's next?"

"To continue to address these crises on an ad hoc basis means leaving fishing communities in limbo, buffeted by changing oceans and regulations that can't adequately adapt," says Arnold.

"We have to start embedding adaptability into what is otherwise a very rigid structure of fisheries management in Canada," says Arnold. "If we don't, we risk the future of our Maritime communities. This is going to get worse before it gets better, and the North Atlantic right whale is just the canary in the coal mine."

Reanne Harvey is a Masters student at Dalhousie University studying Marine Management. She would like to see more support for co-management when it comes to climate change adaptation for coastal communities.