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Thank you to Chairman Bentz, and Ranking Member Huffman, for inviting me to testify on the RESCUE Whales Act. I am a Senior Scientist and Veterinarian at the Woods Hole Oceanographic Institution, a past chair of the NOAA Fisheries Working Group for Unusual Marine Mammal Mortality Events, and past member of the NOAA Fisheries Atlantic Scientific Review Group. These are my own words. My work has focused on the diagnosis, effects, and prevention of shipping and fishing trauma on North Atlantic right whale survival and welfare. My recent book, 'We Are All Whalers' (1), discusses how our consumer demand enables such supply chain driven trauma, and we thus all contribute, as figurative whalers, to the right whale's extinction risk.

I currently monitor changes in North Atlantic right whale health and growth, using aerial images. I also work with fishermen and engineers to establish buoy-less 'On-Demand' fishing systems as a viable tool to remove line from the water column to sustain trap fisheries, while avoiding large whale entanglement trauma.

Omnibus Act of 2022

The Omnibus Act 2022 makes substantial funding authorizations and initial appropriations for North Atlantic right whale conservation through the development of innovative technology. However, it also suspends any conservation measures planned by NOAA after the 2021 'Final' Rule amending the regulations implementing the Atlantic Large Whale Take Reduction Plan, until development of additional whale protection measures by December 31, 2028.

The RESCUE Whales Act (Act) would repeal the Congressionally mandated North Atlantic right whale conservation measures suspension from December 2022 to December 2028.
I have three reasons to support that Act.

Reason 1 – A species in immediate jeopardy

These animals migrate between their calving grounds in waters off the SE United States, and their feeding grounds in the waters of New England and the Canadian Maritimes. With ~340 left, they are close to extinction. Between 1990 and 2010, they slowly increased their numbers from ~250 to just less than 500, but then began a steep decline in 2011 with increased mortalities and serious injuries in US and Canadian waters. Currently, for every calf born, three animals die (*2-4*). Their survival, growth and reproduction are primarily impacted by foraging success, and trauma caused by vessel collisions and entanglement in fishing gear.

In contrast, human-caused trauma is rarely observed in the closely related Southern right whale species (*Eubalaena australis*), located around the southern hemisphere, where fishing and vessel activities occur at much lower levels. As a result, they are more abundant and have better reproductive rates. North Atlantic right whales are all in poorer body condition than Southern right whales (*5*), and there are indications that entanglements in fishing gear contribute to this poor condition which in turn has negative impacts on growth, survival, and calving rates (*6*).

Only 72 reproductively active North Atlantic right whale females remained in 2018 (*7*). Normally adult females, older than 8-10 years old, calve every three years. Currently those that calve do so on average every seven years. There are an additional ~46 females over the age of 10, seen in the last few years, who have not yet calved. Thus, ~40% of females are currently barren (*8*). The reasons for these changes in reproductive output are related to human impacts and shifts in their prey resources (*6, 9*).

Figure 1 places the six-year suspension of conservation measures in the context of the status of the right whale species.

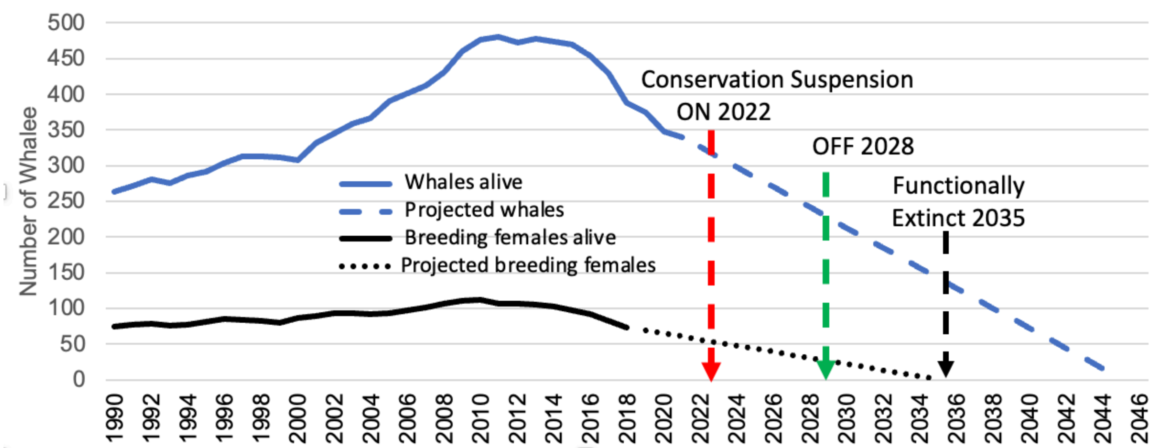

Figure 1 *– Congressional suspension of legislatively mandated conservation measures under the Endangered Species and Marine Mammal Protection Acts in the context of what we know about the species. Population size is modelled from repeated sightings of each animal, catalogued by their individually identifiable markings. The solid blue line shows the most recent numbers of all North Atlantic right whales since 1990 through 2021 (3), and the solid black line, of breeding females alive through 2018 (7), the last year of that analysis. The dashed blue line shows a linear projection of the mean annual loss of all whales since their decline began in 2011. The dotted black line shows the same calculation for the numbers of breeding females between 2011 and 2018. The red and green arrows show the beginning and the end of the conservation measures suspension. The black arrow shows when there will be no more breeding females in 2035, based on these calculations.*

If these declines continue unchanged at the projected rate, the species will go functionally extinct around 2035, when there are no more breeding females, with no more right whales to follow at some later point. The Omnibus Act closed about half of the remaining window of opportunity to recover the species. Actual loss rates will of course vary depending upon the timeliness and effectiveness of additional vessel and gear conservation and innovation measures in the US and Canada, and many other factors. This figure serves solely to establish a timeline for this argument. Extinction risk modelling (*10*) would further focus this issue, but the value of repealing the suspension to allow for more timely conservation measures is very clear, given what we now know. However, the situation is not hopeless. They came back from a previous low of 250 in 1990: entanglement was less severe, vessels fewer and slower, and calving more robust.

Reason 2 – An available solution to entanglement

The Omnibus Act supports Innovative Technology, creating the opportunity to make very rapid technology advances to put fishermen back to work in otherwise closed areas. Repeal of the suspension would enable faster adoption of On-Demand technology, removing persistent vertical buoy line from the water column by the acoustic release of bottom-stowed recovery gear for trap retrieval.

These systems have already enabled commercial harvests in areas closed to vertical buoy lines: in the Gulf of St Lawrence Snow crab fishery in 2022, and in the Massachusetts Restricted Area between February and May 2023.

Massachusetts fishers are harvesting lobster to sell from an area they have been closed out of since 2015 to support North Atlantic right whale conservation. On-Demand systems can and should be rapidly accelerated into a functional, safe, economic, commercial tool, with comprehensive gear conflict avoidance established within two years. This should initially be focused on areas of high fishing effort, when and where North Atlantic right whales are known to occur. A process that has been discussed and modelled extensively by the Atlantic Large Whale Take Reduction Team (*11*). NOAA's Northeast Fishery Science Center Gear Lending Library (*12*) is currently working with 37 Active collaborator fishers in ME, MA, RI, and MD, with 6 more ready for training, to further the development these systems. Retrieval, geolocation, efficiency, safety, and affordability are all major priorities. For instance, On-Demand systems costing hundreds, not thousands of dollars, are now under trial through the library. There will be a NOAA Fisheries workshop Fall 2023 to establish inter-operability standards for On-Demand gear to enable other trap and mobile gear fishers, and law-enforcement to locate gear on plotters, without the need for surface buoys, and persistent vertical lines.

The Omnibus Act seeks to enable lobster fishing in North Atlantic right whale habitat, by real-time detection of whales and responsive dynamic closures to mitigate pending risk. Canada has been attempting to use so-called' 'dynamic management', where whale sightings trigger closures. However, in 2022, at least 8 entanglement events were detected in the Gulf of St Lawrence (*8*), despite these efforts. The problem lies with the high density of gear over a large area and a relative scarcity of whales within any one region. Thus, the use of on-demand gear should be phased in to occur more broadly throughout the right whale's range.

Even with gear marking requirements, between 1980 and 2020 of 1749 entanglement events, 8% or 134 cases, were observed carrying gear (*8*), with only a subset linked to country and region of occurrence. Most entanglements result in scars only indicating they escaped from the gear, but their resulting injuries can be significant. Therefore, despite some information that can be gleaned for cases with attached gear, it will be very difficult, even with increased gear marking now required, to determine where entanglements occur given how few whales remain within a broad expanse of ocean containing millions of vertical lines in the water.

Figure 2 shows recent sightings in relevant trap fishing areas. Concerns for a lack of recent mortality indicating no future risk of sub-lethal or lethal entanglement in gear dense regions, if there is ongoing presence of North Atlantic right whales in such areas, ignore ongoing risk.

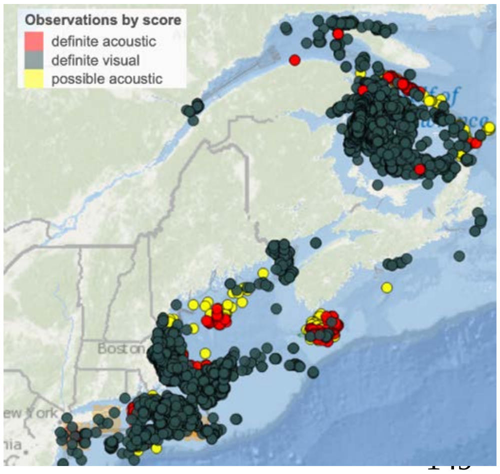

Figure 2 *– North Atlantic right whale sightings, 2017/01/01 to 2022/13/31 Not corrected for effort.* [*whalemap.org*](whalemap.org)*. Although the northern Gulf of Maine has lower whale sightings, the gear is very dense in some areas: it is not risk free.*

Thus, defining risk hotspots to establish 'static' conservation measures, such as removing line from the water column using On-Demand systems, and slowing vessels in North Atlantic right whale habitat, is a critical first step to allowing fisheries and vessels to co-exist with the whales sustainably, and profitably.

Reason 3 – A persistent, unresolved animal welfare crisis

In 2006, we reported that lethally entangled North Atlantic right whales take an average of six months to die (*13*). I naively believed that our report would elicit widespread popular support for development of fishing systems that avoided entanglement altogether. The Omnibus Act has provided the funding potential to conserve the species and fisheries while also substantially reducing the extreme pain and suffering these animals currently endure. But to succeed, it must be done without a six-year hiatus, one that could well be lethal to the species.

North Atlantic right whale background science

North Atlantic right whales have evolved an energy budget that balances food income against the costs of metabolism, growth, migration, thermoregulation, diving, and foraging. In good years, females can also afford to breed, gestate, and suckle. However, their budget has not evolved to allow for unexpected costs, such as vessel strikes, and entanglement trauma (*14*). Entanglement in fishing gear can last for days to years and can cause unsustainable declines in blubber stores and require energy investment comparable to the energetic cost of gestating a calf, or of migration (*15*). Thus, recovery from such physiological stress and disturbance likely compromises an individual's future reproductive success, making entanglement a potentially significant contributor to fluctuations in population growth along with variable food supplies. As a result, mitigations addressing entanglement risk must also address sub-lethal as well as lethal stressors (*16*). The latter are the sole current focus of mitigations driven by the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA). Unless sub-lethal trauma is also mitigated, the species will struggle to recover.

Climate change has prompted more whales to find new foraging habitats increasing their risks of vessel strike and entanglement. Furthermore, the increased strength of lines used in the trap and gillnet industries since the mid-1990s (*17*) has increased entanglement severity. Severe entanglements decreased health, increased the risk of mortality, reduced birth rates, decreased calf survival, and increased calving intervals (*6*). However, unentangled whales also showed a health reduction through time although not as pronounced, suggesting that food limitation is also significant but not the main contributor to health declines. Energetic modelling of food intake, versus the energetic costs of normal life as a right whale, and additional costs of entanglement and sub-lethal vessel strikes is ongoing but hampered by very poor understanding of the normal energy budget of these whales.

A study of North Atlantic right whale growth (Figure 3) showed entanglements have been associated with average adult body lengths being shorter for recent adults compared to those maturing in earlier decades (*18*). Larger whales have shorter inter-birth intervals and produce more calves per potential reproductive year (*19*).

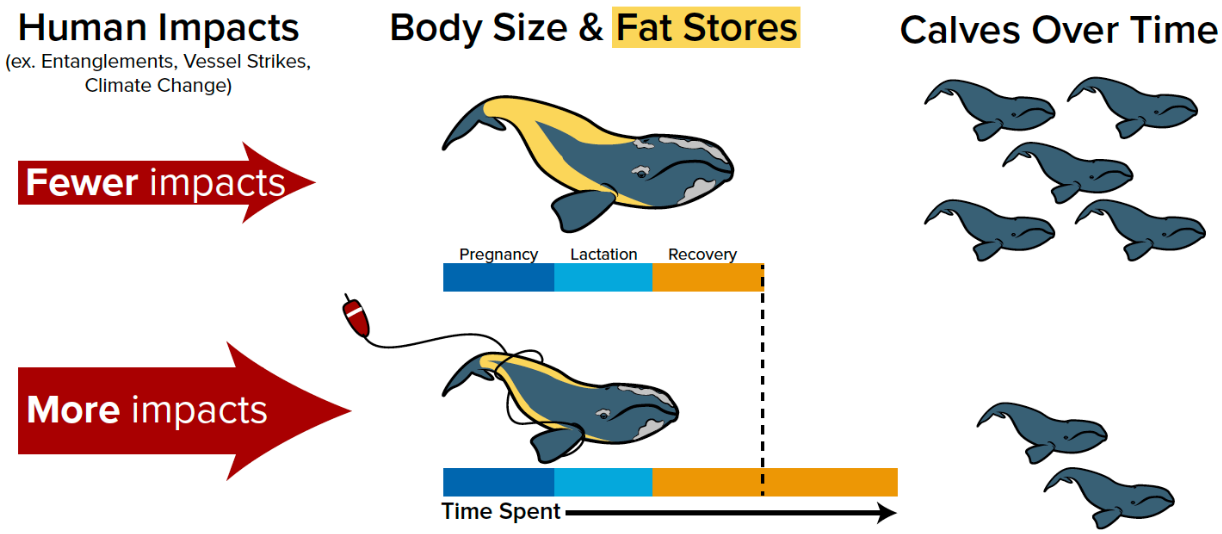

***Figure 3** – A summary of the impacts of human activities on North Atlantic right whale growth and reproductive success (18, 19). The health of an individual is the sum of feeding success, and the detriments of human-induced trauma. Healthy animals grow larger with more blubber stores (yellow) and can replenish their energy reserves after pregnancy and lactation, and hence be ready to reproduce again sooner (shorter recovery time - orange) than those affected by cumulative trauma. (© WHOI Creative).*

In summary, the species cannot sustain further delays in mitigating the risk posed to them by incidental entanglements in fishing gear throughout their habitat. While the Omnibus Act provides the much-needed financial support to develop On-Demand as a sustainable solution to fisheries, the delay in implementing further regulatory measures until 2028 jeopardizes the very existence of the species these funds are intended protect.

Citations

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