

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

RICHARD MAX STRAHAN

Plaintiff,

v.

SECRETARY, MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND
ENVIRONMENTAL AFFAIRS, *et al.*,

Defendants,

and

MASSACHUSETTS LOBSTERMEN’S
SURVIVAL FUND,

Intervenor-Defendant.

*
*
*
*
*
*
*
*
*
*
*
*
*
*
*

Civil Action No. 1:19-cv-10639-IT

INDICATIVE RULING AS TO LIABILITY AND REMEDIES

November 30, 2021

TALWANI, D.J.

This suit under the Endangered Species Act (“ESA”) seeks to protect the critically endangered North Atlantic right whale from entanglement in the tens of thousands of vertical buoy ropes licensed by the Commonwealth of Massachusetts’ Division of Marine Fisheries for deployment in Massachusetts state waters. The court granted Plaintiff Richard Strahan certain preliminary relief but denied a request for further preliminary relief in light of factual disputes necessitating an evidentiary hearing and set the matter for trial on an expedited schedule. Plaintiff appealed the denial of further injunctive relief, and the First Circuit Court of Appeals granted Defendants’ request to stay briefing in that appeal while the trial proceeded. In June

2021, this court held an eleven-day bench trial on both liability and remedies. The court heard from leading experts on whale biology and conservation, the Director of the Division of Marine Fisheries and the head of its protected species conservation unit, Massachusetts lobstermen, and others.

As set forth in the court's Findings of Fact and Conclusions of Law on Standing [#612], the court has determined that Plaintiff failed at trial to meet his burden of establishing standing under Article III of the federal Constitution. Accordingly, the court does not have jurisdiction to adjudicate this action.

The court anticipates that Plaintiff will appeal the court's decision on standing. The court is also cognizant that the First Circuit stayed briefing of the pending appeal of the court's denial of further preliminary injunctive relief during the pendency of the trial, post-trial briefing, and this court's decision on the merits. Accordingly, the court sets forth here an indicative ruling on liability and remedies that this court would issue if the standing decision were reversed and the case remanded for further proceedings on the merits of Plaintiff's claim.¹

I. Procedural Background and Regulatory and Statutory Scheme

The background of these proceedings and the regulatory and statutory scheme relevant to the parties' claims and defenses are detailed in the court's Memorandum and Order [#160].

¹ Plaintiff's Amended Complaint [#68] also contended that Defendants' actions harmed endangered leatherback turtles. The court does not address the merits of this claim where Plaintiff made a lesser showing as to standing regarding the leatherback turtle and where the motion for preliminary relief that is currently on appeal argued the urgency of the matter based on the threatened harm to the right whale, not to the leatherback turtle. See Pl.'s Mem. in Support of Mot. for Prelim. Relief [#260].

II. Findings of Fact

A. *North Atlantic Right Whale Status, Habitat, and Threats to its Survival*

1. Right Whales Are Critically Endangered

The North Atlantic right whale (also “right whale”) was first listed as endangered under the ESA in 1970 and has remained endangered ever since. 35 Fed. Reg. 8,491, 8,495 (June 2, 1970); Day 1 Trial Tr. 41:14–22; Ex. 671 at 82–83. In 1997, the right whale population was estimated at about 270, which then increased to approximately 460-80 animals in 2010. Day 5 Trial Tr. 82:12–15; Ex. 528 at slides 5–6. The National Marine Fisheries Services (“NMFS”) reports, however, that since 2010, the North Atlantic right whale population has been declining, and in 2017, the decline was exacerbated by an Unusual Mortality Event,² in which seventeen right whales died. Ex. 1030 at 9-295. In October 2020, NMFS estimated that 366 individual whales remained. *Id.* at 1–2; Day 1 Trial Tr. 79:23–80:15; see also Ex. 671 at 82 (reporting the estimate as 368 individuals in January 2019).³ The “[P]otential [B]iological [R]emoval” rate, that is, the mortality rate that a species can withstand without impeding the potential for recovery, for right whales is currently 0.8 per year. Day 1 Trial Tr. 17:8–13; Day 5 Trial Tr. 82:16–23; Ex. 104 at 22.

² An Unusual Mortality Event is a NMFS designation referring to when a substantial number of animals of a protected species perishes over a short period of time. Day 1 Trial Tr. 85:19–25.

³ Plaintiff has submitted a Notice of Supplemental Authority [#608] that brings to the court’s attention a press release, see Pl.’s Notice, Ex. A [#608-1], from the New England Aquarium reporting a further significant decline in the population. Because the record is closed, and this press release is not a matter as to which the court may take judicial notice, the court does not consider this additional authority.

2. Right Whales Have an Extensive Habitat and Range

The majority of North Atlantic right whale sightings occur within approximately fifty miles of the shoreline, with the right whales' habitat extending the length of the coast, from calving grounds in the coastal waters of Florida to feeding grounds in New England waters up to the Gulf of St. Lawrence, and beyond. Day 1 Trial Tr. 21:16–23, 53:17–21; Ex. 104 at 17.⁴ Right whales can swim up to seventy-five miles per day, and they move within and between their habitats extensively. Day 9 Trial Tr. 136:19–23; Ex. 104 at 17–18. As one example, in 2000, a single animal was photographed in Florida waters on January 12, in Cape Cod Bay on January 23, off Georgia on February 16, and back in Cape Cod Bay on March 23. Ex. 104 at 18. As the Division of Marine Fisheries acknowledges, it is not uncommon for solitary right whales to be observed anywhere within the range of the species at any time of the year. Day 1 Trial Tr. 41:22–42:9; Day 2 Trial Tr. 49:25–50:15; Ex. 104 at 17–18; see also Ex. 671 at 187 (noting that scientists' understanding of the whales' migration remains incomplete and that more recent monitoring data “demonstrated nearly continuous year-round presence across their entire habitat range (for at least some individuals) . . . suggest[ing] that not all of the population undergoes a consistent annual migration”).

3. Right Whales Face Threats of Injury or Death from Entanglements in Vertical Buoy Ropes

The American lobster is fished by recreational and commercial fishers from North Carolina to the coast of Maine. The principal mechanism for fishing for American lobster is the lobster-pot trap. These traps, which can either be fished as single traps (most commonly in the

⁴ Right whales have been sighted as far away as Iceland, northern Norway, and the Azores. Ex. 104.

case of recreational fishers) or as a trawl of traps (most commonly in the case of commercial fishers) are identified on the surface by a buoy and retrieved from the seafloor with a strong rope called a vertical buoy rope. In the case of a trawl of lobster pots, fishers will often use two vertical buoy ropes, one at each end of the trawl.

As the American lobster fishery is primarily fished in coastal waters (i.e., in waters under the jurisdiction of state governments), the states that participate in the fishery have agreed to manage the fishery under an Interstate Fishery Management Program promulgated pursuant to the Atlantic Coastal Fisheries Cooperative Management Act (“Atlantic Fisheries Management Act”).

It is undisputed that North Atlantic right whales are often entangled in the vertical buoy ropes used by the American lobster fishery. A thirty-year study by Amy Knowlton,⁵ the Commonwealth’s expert witness on the anthropogenic impacts on right whales, documented 1,032 unique “entanglement events” on 626 individual whales identified. Eighty-three percent of the right whales identified had had an entanglement event severe enough to leave a detectable scar, and fifty-nine percent of right whales had evidence of more than one entanglement event. Ex. 104 at 25. Ms. Knowlton’s study revealed that efforts made since the 1997 Take Reduction

⁵ Amy Knowlton is a Senior Scientist with the Anderson Cabot Center for Ocean Life at the New England Aquarium. Day 6 Trial Tr. 101:17–21; Ex. 1068. She has worked at the aquarium and studied right whales for almost four decades, joining as a volunteer in 1983, becoming a full-time Research Assistant in 1988, and, following additional promotions, becoming a Senior Scientist in 2017. Day 6 Trial Tr. 103:19–106:20. She obtained a master’s degree in Marine Affairs from the University of Rhode Island in 1997, has multiple peer-reviewed journal articles on anthropogenic impacts on right whales, has presented extensively in the area, and was qualified by the court as an expert on the anthropogenic impacts on right whales. *Id.* at 102:22–24, 108:6–109:17, 111:23–112:3; Ex. 1068.

Plan have not reduced the incidence of entanglements. Id.; Day 7 Trial Tr. 126:2–4; see also Ex. 594B at 9.

Between 2010 and 2018, sixty-three percent of all documented serious injuries and mortalities among right whales occurred because of entanglement, fifteen percent were caused by vessel strikes, and twenty-two percent had an unknown cause. Ex. 1030 at 2-29–2-30. Moreover, these numbers are known to underrepresent injuries due to entanglements. Id. at 2-29. In total, according to the most recent estimates provided by NMFS in its 2021 Biological Opinion (“BiOp”) on the interactions between the American lobster fishery and the North Atlantic right whale, between 2010 and 2018, right whale mortalities and serious injuries from entanglements in U.S. trap pot fishing gear averaged 7.57 per year, and three per year result from entanglements that take place in state waters. Ex. 671 at 223–24.⁶

Entangled whales face both acute and subacute risks. Acutely, vertical buoy ropes can kill a North Atlantic right whale by anchoring the whale to the sea floor so that the whale is unable to reach the surface to breathe, causing the whale to drown. See Day 4 Trial Tr. 16:6–18:8, 21:6–17; Day 5 Trial Tr. 27:21–25. Vertical buoy ropes can also cause other acute injuries to right whales that may sometimes result in lethal outcomes. For example, Dr. Sarah Sharp,⁷

⁶ In calculating mortalities and serious injuries, the BiOp takes into account the phenomenon known as “cryptic mortality.” Day 6 Trial Tr. 22:23–24:6; Ex. 671 at 216 (“To account for this underrepresentation of non-M/SI events in the observed entanglement data, our annual entanglement estimate for this Opinion is based on the scarring analysis presented in Hamilton et. al. (2019)”). Cryptic mortality is based on the observation that while entanglement is the documented cause of eighty-seven percent of serious injuries in right whales, it is determined to be the cause of death in only about fifty percent of actual necropsies. Scientists have extrapolated from this to estimate entanglement-caused deaths that go unobserved. Day 4 Trial Tr. 113:22–114:4.

⁷ Dr. Sharp was called by the Plaintiff and qualified by the court as an expert in the field of marine biology and veterinary medicine, with a specific background regarding North Atlantic

testified that the rope can sometimes become lodged in the animal's blow hole, interfering with its ability to breath, or in its mouth, interfering with its ability to feed. In other instances, the rope may end up wrapped around the animal's flippers and flukes, creating constricting lesions where the rope "saws" through the tissue to the point that the fluke or flipper becomes unusable. Day 4 Trial Tr. 54:15–55:21. It is possible for injuries of this nature to hamper the animal's ability to swim, increase its susceptibility to predation, and to cause disease. All of these may ultimately lead to death. See id. at 16:6–18:5, 38:13–39:11, 53:7–55:21, 55:22–60:22.

Even in the absence of observable physical injuries, entanglements stress the animal by causing increased drag, which interferes with its ability to forage, feed, and migrate. Witnesses for both the Plaintiff and the Commonwealth testified that the most significant effect of this stressor is a reduction in the calving rate for female North Atlantic right whales. See Day 1 Trial Tr. 50:13–51:7 (Robert Glenn,⁸ the Commonwealth's witness, testifying that it was his understanding, based on his review of the scientific literature, that declines in female right whale health are related to sublethal effects of entanglement in fishing gear); Day 4 Trial. Tr. 89:7–90:7

right whales. Day 4 Trial Tr. 41:6–12. She is a veterinarian with the International Fund for Animal Welfare ("IFAW"). Id. at 8:16–17. She graduated with an undergraduate degree in human biology from Stanford University and a degree in veterinarian medicine from Tufts University. Id. at 7:19–8:5. Dr. Sharp's current role at IFAW includes both clinical and research roles. She leads IFAW's team providing care to live stranded mammals and necropsying dead animals. Id. at 9:3–11. She has performed necropsies on thirty-five large whales, including five North Atlantic right whales. Id. She has published peer-reviewed research in the field of the anthropogenic causes of North Atlantic right whale deaths. Id. at 18–25.

⁸ Mr. Glenn is the deputy director of the Division of Marine Fisheries and serves, among other roles, as the program manager for the assessment and survey program. Day 1 Trial Tr. 14:7–12. Mr. Glenn's role includes managing the Division of Marine Fisheries' protected species project, which oversees the biological monitoring of large whale and sea turtle species in Commonwealth waters. Id. at 15:1–4. Mr. Glenn has worked for the Division of Marine Fisheries since 1995, id. at 15–17, and has served as Massachusetts' representative on the Atlantic Large Whale Take Reduction Team for the past ten years, Day 2 Trial Tr. 45:5–46:13.

(Dr. Sharp testifying that “chronic stressors and chronic issues from entanglement may be impacting that animal’s ability to successfully reproduce. There’s a lot of factors, but certainly that is one that’s of great concern”); Day 9 Trial Tr. 50:11–51:14 (Dr. Michael Moore⁹ explaining “entanglements reduce[] the ability of the animal to invest in its normal energy budget” and “one piece of its budget that it can be elective about is whether it gets pregnant or not”); Day 7 Trial Tr. 127:24–128:6 (Ms. Knowlton agreeing that “sublethal entanglement drag reduce[s] North Atlantic right whale . . . fecundity”). Empirical studies reveal that while the expected intercalving interval for a right whale is three years, the current intercalving interval for North Atlantic right whales is seven years. Day 9 Trial Tr. 63:1–9, 62:23–25. While no expert associated the increase in the intercalving period entirely to stressors from entanglement, there was unanimity that it was a primary factor.

In addition to the effects on the intercalving interval, the evidence suggested that entanglements were having systemic effects on the species. In a June 2021 article, Dr. Moore and Ms. Knowlton coauthored a study on the effects of several variables on the expected growth size of the North Atlantic right whale and found that whales born in 2019 are expected to reach a maximum body length one meter shorter than a right whale born in 1981. *Id.* at 65:16–67:2,

⁹ Dr. Moore was an unretained expert offered by the Plaintiff. Dr. Moore was trained and received undergraduate and graduate degrees as a veterinarian at the University of Cambridge in England, worked at the marine biological laboratory in Woods Hole, and then completed graduate work and obtained his Ph.D. at the Woods Hole Oceanographic Institution–Massachusetts Institute of Technology joint program in biological oceanography. His work on numerous projects has included an analysis of and survey of the health of right whales, with support from the Northeast Fisheries Science Center in Woods Hole. The court qualified him as an expert with regard to his veterinary expertise, anthropogenic impact and the health of the North Atlantic right whales and their habitat, and the functionality of ropeless technology gear. Day 9 Trial Tr. 33:17–34:2.

70:7–71:14; Ex. 3003 fig. 1. Moreover, because the authors had entanglement data available as a covariate, the authors concluded that entanglements contributed to this finding. Day 9 Trial Tr. 68:2–11; Ex. 3003 fig. 2.

Not all entanglements have been caused by U.S. gear. In recent years, one of the greatest threats to the North Atlantic right whale has been entanglement in Canadian gear.¹⁰ Indeed, between 2014 and 2021, NMFS was able to determine a country of origin for twenty-four of eighty-nine serious injury and mortality entanglements and twenty were determined to have originated in Canada. Ex. 160 at 19. Since 2017, there have been forty-two North Atlantic right whale deaths, of which twenty-one have been attributed to Canada, thirteen to the United States generally, with the remainder unknown. Day 5 Trial Tr. 96:16–97:2; Day 6 Trial Tr. 7:21–8:8. In total, NMFS estimates that fifty percent of right whale mortality and serious injury entanglement occur in each country. Exhibit 1030 at 2-38–2-39.

4. Right Whales Face Additional Threats

The North Atlantic right whale’s precarious situation is a multi-faceted problem that is not caused by entanglements alone.

One major threat is that posed by the metabolic demands of a changing migration pattern. In approximately 2010, the North Atlantic right whale began to shift its migration patterns to the Gulf of St. Lawrence, likely on account of climate change and the migration of the whale’s food source. Ex. 671 at 215; Day 2 Trial Tr. 29:12–30:11; Day 4 Trial Tr. 138:2–140:17; Day 9 Trial

¹⁰ Because of the migratory nature of the whales and Massachusetts’ specific monitoring efforts, it is not uncommon for animals to be first identified as entangled in Massachusetts but then to find that the entangling gear is Canadian. In 2020 and 2021 two whales—Cottontail and Snow Cone, respectively—were found entangled in Massachusetts state waters in heavy 5/8” rope, gear that was later attributed to Canadian snow crab fishing. Day 11 Trial Tr. 41:16–42:11; Ex. 160 at 23; Day 5 Trial Tr. 119:24–121:1.

Tr. 220:1–24. The right whales face significant metabolic cost resulting from the additional migration up to the Gulf of St. Lawrence, an additional 1,600 miles (round trip) each year. Day 2 Trial Tr. 29:24–30:11; Day 5 Trial Tr. 119:18–23; Day 9 Trial Tr. 188:7–20.

The North Atlantic right whale is also subject to serious injury and mortality due to vessel strikes. Specifically, fifteen percent of right whale serious injury and mortality is caused by vessel strikes. Day 1 Trial Tr. 125:17–127:17; Ex. 1030 at 2-29–2-30 & tbl. 2.1. While vessel strikes are an important consideration, studies reveal that, year over year, vessel strikes have been decreasing in incidence while entanglements have been increasing. Ex. 104 at 22–23 & fig. 4; Ex. 594B at 2, 7–8; Ex. 671 at 180–81; Ex. 1030 at 2-29–2-31.

*B. Threats and Injuries to North Atlantic Right Whale Caused by Vertical Buoy Ropes in Massachusetts State Waters*¹¹

1. Right Whales Have a Significant Presence in Massachusetts State Waters

Massachusetts state waters, and Cape Cod Bay in particular, are an increasingly important habitat for the North Atlantic right whale and host large aggregations of right whales during the winter and early spring months every year. Day 1 Trial Tr. 51:21–52:5; Ex. 1087 at 4 (2014 Division of Marine Fisheries report noting “the steady increase in the portion of the North Atlantic population yearly visiting the bay”). The animals have spent additional time in Cape Cod Bay as climate change has increased the abundance of zooplankton, the whales’ food, in the New England area. Day 1 Trial Tr. 114:2–115:1; Day 2 Trial Tr. 29:12–30:11; Ex. 104 at 18; Ex. 528 at slide 9; Ex. 594B at 1, 3–4, 6; Ex. 671 at 210, 215; Ex. 1092 at CW035308–10. As a result, approximately sixty-five percent of the known right whale population visits Cape Cod

¹¹ Massachusetts state waters, as regulated by the Commonwealth, extend three nautical miles from the Massachusetts shoreline out to sea, and include the waters of Nantucket Sound. See Mass. Gen. Laws ch. 130, § 1; 322 C.M.R. § 8.02; Day 10 Trial Tr. 73:23–75:7.

Bay during this period each year, and, at any given time during this period, more than half of all known right whales can be found in the Bay. Day 1 Trial Tr. 51:21–52:3; Ex. 547 at 2; Ex. 1134; Ex. 3011; Ex. 3012. This is the largest known aggregation of right whales in the world, and because these numbers are limited to confirmed sightings, they most likely underestimate the actual prevalence of right whales in the Bay. Day 6 Trial Tr. 51:16–52:1; Ex. 544 at slide 6; Ex. 1092 at CW035306.

The right whale aggregations in Massachusetts state waters follow a fairly consistent seasonal pattern. Sightings of right whales in Massachusetts increase in the month of January, beginning with almost no sightings at the beginning of the month and increasing to slightly higher numbers later in the month. Day 10 Trial Tr. 108:18–109:5; see also Ex. 3011 at slide 2 (January 2016 sightings), slide 14 (January 2017 sightings), slide 27 (January 2018 sighting), slide 40 (January 2019 sighting), slide 53 (January 2020 sighting); Ex. 3012 (same slide numbers).

A large aggregation of right whales typically begins to form in Massachusetts state waters in February of each year, focused particularly in Cape Cod Bay. Ex. 1134 at slides 2-3; Ex. 3011 at slides 2–3, 14–15, 27–28, 40–41, 53–54. Mothers and calves usually arrive later than the rest of the right whale aggregation, in March or April. Day 7 Trial Tr. 133:19–23. The prime months of right whale aggregation in Massachusetts state waters are in March and April. Day 9 Trial Tr. 176:11–12. A peak typically occurs in state and near-federal waters in April. Day 10 Trial Tr. 108:22–109:5, 109:22–24, 110:3–5; Ex. 1134 at slides 4-5; Ex. 3011 at slides 4–5, 16–17, 29–30, 42–43, 55–56. Right whales typically stay in Massachusetts state waters until late April or early May of each year. Day 7 Trial Tr. 133:19–25; Day 9 Trial Tr. 135:10–16, 176:3–12.

In early May, the right whales tend to exit state waters, moving north and east. Day 4 Trial Tr. 138:17–139:21; Ex. 1134 at slides 5-6; Ex. 3011 at slides 6, 18–19, 57–58. There is a significant drop-off in right whale sightings in state waters after early May. Day 10 Trial Tr. 106:17–107:18. Sightings after early May are typically, but not always, solitary sightings. *Id.* at 110:11–16; Ex. 1134; Ex. 3011 at slide 6 (May 2016 sightings), slide 18 (May 1-4, 2017 sightings), slide 19 (May 5-31, 2017 sightings), slide 31 (May 1-15, 2018 sightings), slide 44 (May 1-9, 2019 sightings), slide 45 (May 10-31, 2019 sightings), slide 57 (May 2020 sightings).

Right whales have limited presence in state waters from June through December of each year, and no known aggregations of right whales have occurred in those seven months in decades. Day 9 Trial Tr. 179:15–19 (Dr. Moore testifying that there is no known aggregation of right whales in Massachusetts state waters outside of the spring aggregation); Day 10 Trial Tr. 85:15–86:14; Ex. 1134 at slides 7–13. It is not uncommon for there to be whole months where there are no reported sightings of right whales in Massachusetts state waters at all. Day 10 Trial Tr. 85:17–86:14; Ex. 3011 at slides 7–8, 10–13 (no sightings in 2016 in June-July or September-December), slides 22–24 (no sightings in 2017 in August-October), slides 36–38 (no sightings in 2018 in September-November), 46, 48–49, 51 (no sightings in 2019 in June, August-September or November), slides 59, 62–64 (no sightings in 2020 in July or October-December); Ex. 3012 (same slide numbers). Nonetheless, there have been reported sightings of right whales in Massachusetts state waters each year during these seven months. Day 10 Trial Tr. 85:17–86:14; Ex. 3011 at slides 9 (sightings in August 2016), slides 20–21, 25–26 (sightings in June-July and November-December 2017), slides 33–35, 39 (additional sightings in June-August and December 2018), slides 47, 50, 52 (additional sightings July, October, and December 2019), slide 61, (additional sightings in September 2020); Ex. 3012 (same slide numbers).

2. Vertical Buoy Ropes Licensed by the Division of Marine Fisheries are Deployed in Massachusetts State Waters

Commercial fishers licensed by the Division of Marine Fisheries must submit reports stating the number of vertical buoy lines and lobster pots they deploy. Day 2 Trial Tr. 13:15–17:15; see, e.g., Ex. 513 (2016 report); Ex. 514 (2014 & 2015 reports); Ex. 530 (2017 report); Ex. 670 (2018 report). Based on the most recent data, commercial fishers deploy approximately 80,000 lines per year in Massachusetts state waters. Ex. 546.

3. There is Direct Evidence of Right Whale Entanglements Occurring in or Near Massachusetts State Waters

In September 2016, a right whale known as Sundog was sighted north of Race Point, Provincetown, with lines from Massachusetts lobster gear¹² wrapped around its rostrum and

¹² The Commonwealth contends that there is “no admissible evidence” as to state waters origin of the September 2016 entanglement event.” Comm.’s Prop. Findings of Fact 42 [#577]. National Oceanic and Atmospheric Administration (“NOAA”) records show that the whale was spotted 6.5 nautical miles north of Race Point with gear sourced to a United States lobster pot fishery. Exhibit 1112 at line 239. NOAA’s records do not state whether the gear was initially placed in state waters. Id. However, Mr. Glenn testified that it was his understanding that the gear was retrieved and that NOAA was able to identify the particular individual the gear belonged to and to confirm that the gear was Massachusetts-licensed gear placed in Massachusetts state waters. Day 1 Trial Tr. 69:24–70:8; Day 5 Trial Tr. 92:14–24. This is consistent with the Commonwealth’s responses to Plaintiff’s requests for admissions. See Ex. 3000. There, Plaintiff inquired as to whether the Commonwealth admitted that “endangered whales on occasion become entangled in either lobster-pot fishing gear and/or gillnet fishing gear that is licensed and regulated by the Massachusetts Division of Fisheries.” Id. at 2. The Commonwealth responded that “[s]ince 2000, there have only been two (2) North Atlantic Right Whales . . . confirmed to have been entangled in lobster-pot fishing gear, in 2009 and 2016, respectively.” Mr. Glenn confirmed the accuracy of this admission during his testimony. Day 1 Trial Tr. 37:9–12. Based on Mr. Glenn’s testimony, the Commonwealth’s admissions, and NOAA’s records, the court finds that there is a preponderance of evidence that a right whale was entangled in Massachusetts-licensed gear in or about September 2016.

heavy gear and buoys trailing behind its flukes. Ex. 1112 at row 239. The whale was disentangled without serious injury. Id.¹³

On October 23, 2017, a carcass of a juvenile North Atlantic right whale, IFAW 17-375Eg, was found on Nashawena Island in Massachusetts. See Day 4 Trial Tr. 74:16–20; Ex. 286 at WHOI-000352. The whale was covered with cuts, bruises, and trauma around its head, upper jaw, and flippers, consistent with line entanglement and a considerable struggle to free itself. Day 4 Trial Tr. 74:21–75:19 (testifying that the whale “exhibited multiple linear and curvilinear lacerations, abrasions, and impressions around the flippers, and along the body and on the head or the upper jaw and lower jaw that were consistent with entanglement in the line,” “pretty significant bruising on . . . the right pectoral flipper as well as along the sides of the body in a manner that was . . . consistent with a struggle at depth to, essentially, try to get up to the surface to breathe,” and “hemorrhage throughout those tissues that indicated a trauma associated with, essentially, struggling”). Dr. Sharp testified that she interpreted this evidence to demonstrate that the whale’s cause of death was determined to be “peracute” underwater entrapment. See Day 4 Trial Tr. 74:21–24; Ex. 286 at WHOI-000353. The Commonwealth does not dispute that IFAW 17-375Eg died of probable acute entanglement. Comm.’s Prop. Findings of Fact 45 [#577].¹⁴ The court credits Dr. Sharp’s opinion that IFAW 17-375Eg died of probable acute entanglement.

¹³ There are also documented entanglements that occurred prior to 2016, see, e.g., Ex. 1112 at row 119, but the court gives those less evidentiary value for the purposes of this proceeding.

¹⁴ The Lobstermen’s Survival Fund (the “Fund”), however, does challenge Dr. Sharp’s methodology. Without offering any expert opinion of its own, the Fund contends that the necropsy methodology is “questionable” because “there is no way to test the present methodology of looking at markings on [North American right whale] carcasses to determine that entanglement caused them to die” and that there is “no known rate of error or way to tell if

Dr. Sharp also testified that the death likely occurred in waters near Nashawena Island—Massachusetts state waters—because there was no pronounced water line or sunburn on the animal, making it unlikely that the whale had been floating, dead, for an extended period of time. Day 4 Trial Tr. 79:17–80:13. Dr. Sharp conceded, however, that the whale was likely dead for around a month and may have died up to forty or fifty miles from where it was seen. Day 5 Trial Tr. 22:7–9, 19–22.

While it is plausible that IFAW 17-375Eg was entangled in Massachusetts state waters by rope licensed by the Division of Marine Fisheries, the court does not find that there is a preponderance of evidence to that effect. Indeed, given the size of the “gray zone” in which the whale may have been entangled, the entanglement is as, or more likely, to have occurred in federal waters than in Massachusetts state waters.¹⁵

On August 25, 2018, the carcass of a two-and-a-half-year-old North Atlantic right whale, IFAW 18-244Eg, was spotted twenty-three miles off the coast of Martha’s Vineyard. Ex. 290 at WHOI-000526. All prior sightings of the whale since 2017 had been south of Cape Cod, including four months earlier. *Id.* at WHOI-000528. Dr. Sharp concluded that IFAW 18-244Eg

that methodology yields accurate results.” Fund’s Prop. Findings & Conclusions ¶ 187 [#570]. The Fund assumes, wrongly, that expert opinion is invalid in the absence of controlled testing. Dr. Sharp’s veterinary opinion was that there was no medical explanation for the whale’s death other than entanglement and that the whale had signs consistent with entanglement. The Fund has not offered fact or expert opinion otherwise.

¹⁵ Although Massachusetts state waters, by area, are a small portion of the “gray zone,” the probability that the entanglement was caused by a Massachusetts-licensed rope is not a function of area alone. Instead, the probability of entanglement is a function of the density of lobster pot fishing effort and the presence of North Atlantic right whales. Day 7 Trial Tr. 79:22–80:7, 84:3–93:9; *infra* 24–29; *Dist. 4 Lodge of the Int’l Ass’n of Machinists & Aerospace Workers Loc. Lodge 207 v. Raimondo*, 2021 WL 5317196, at *4-*7 (1st Cir. Nov. 16, 2021). The record shows that the significant majority of lobster pot fishing occurs close to shore. Day 11 Trial Tr. 8:10–10:17; Ex. 530.

died from acute entanglement because she observed multiple entanglement lesions and bruising on the whale's flipper that did not have any accompanying evidence of inflammation, fibrosis, scar tissue, or other evidence of a healing process. Neither a gross necropsy nor histopathological examination revealed evidence of disease. Day 4 Trial Tr. 24:3–17. Moreover, the animal had digestive contents, consistent with recent feeding behavior, and there was evidence of entanglement lesions and bruising. *Id.* at 24:8–17. While Dr. Sharp did not provide any conclusive testimony on where IFAW 18-244Eg was entangled, she testified that, in the case of acute entanglements, the animals are generally found close to where they were entangled.

Again, the Commonwealth does not contest that the cause of death for IFAW 18-244EG was acute entanglement but contends that since the animal was found well outside of state waters and because it could have been entangled up to fifty miles from where it was initially sighted, it is impossible to conclude that the animal was entangled in Massachusetts state waters.

As with IFAW 17-375Eg, the court credits Dr. Sharp's opinion that it is more likely than not that IFAW 18-244Eg died of acute entanglement. The court finds further that Plaintiff has not established that it is more likely than not that the animal was entangled in Massachusetts state waters by rope licensed by Massachusetts but credits Dr. Sharp's testimony that it is reasonable to conclude that the animal was entangled and died somewhere within a fifty-mile radius of where it was found.

C. *Massachusetts' Conservation Efforts*

Massachusetts, often acting in coordination with the Atlantic Large Whale Take Reduction Team,¹⁶ has promulgated conservation measures directed at protecting the North Atlantic right whale.

Beginning in 2015, Massachusetts implemented a closure area in Cape Cod Bay called the Massachusetts Bay Area Restriction. Day 1 Trial Tr. 52:14–20; Day 5 Trial Tr. 107:4–10. Massachusetts' 2015 closure was complementary to NMFS' closure of an overlapping region that extended into federal waters. See Ex. 1010 at 4, fig. 2. However, Massachusetts' closure, unlike the complementary federal closure, extended to recreational fishers. Day 10 Trial Tr. 104:9–19. Prior to 2021, the Massachusetts Bay Area Restriction was in effect from February 1 until at least April 30 of each year, with the director of the Division of Marine Fisheries retaining the ability to unilaterally extend the closure as needed to protect right whales. Day 5 Trial Tr. 107:4–10.

In April 2019, the Take Reduction Team recommended to NMFS a series of measures designed to reduce mortality and serious injury by sixty percent.¹⁷ These measures included time area closures (similar to the Massachusetts Bay Area Restriction), trawling-up requirements

¹⁶ The federal fishery management laws and the Atlantic Large Whale Take Reduction Team are discussed further in the court's Memorandum and Order [#610].

¹⁷ The Take Reduction Team's assertion that its measures will reduce mortality and serious and injury by sixty percent is a disputed question of fact. Plaintiff points to letters written by the Marine Mammal Commission—three individuals, each appointed by the President and confirmed by the Senate, knowledgeable in marine ecology and resource management, 16 U.S.C. § 1401(b)(1)—that are skeptical of the Take Reduction Team's sixty percent figure, opining that that the agency “once again is overestimating the potential effectiveness of the measures being proposed in the Framework in lieu of adopting more stringent measures with a greater probability of success.” Ex. 154 at 10.

(requiring more traps per buoy line), and weak rope requirements. *Id.* at 99:1–4, 99:11–100:4. These proposed measures were part of NMFS’ proposed rule, *id.* at 99:9–13, Ex. 115, and are part of NMFS’ final rule, 50 Fed. Reg. 229 & 697 (2021).

At the same time, Massachusetts formulated its own conservation plan designed to reach the same goal of a sixty percent reduction. Day 5 Trial Tr. 101:20–102:5. The Division of Marine Fisheries’ proposals included geographically extending the Cape Code Bay closure north to cover state waters to the New Hampshire border; requiring universal use of 1,700-pound breaking strength rope (“weak rope”) and rope no thicker than three-eighths of an inch in diameter; trawling up; and reducing the number of licenses available for lobster fishing. *Id.* at 102:8–106:12; Ex. 547. Massachusetts also proposed temporally extending the closure period from April 30 to May 15 of each year (but granting the Division of Marine Fisheries authority to end the closure earlier or later based on whether aggregations of North Atlantic right whales remained in the area). In the fall of 2020, the Division of Marine Fisheries began the rulemaking process to enact the new proposals into the state code, including public hearings and comment and consultation with the Massachusetts Fisheries Advisory Commission. Day 5 Trial Tr. 139:16–21; Ex. 226. The Massachusetts regulations were approved on January 28, 2021, before NMFS implemented its largely complementary measures. Ex. 232.

1. Although Massachusetts’ Weak Rope Requirement Is Likely to Reduce Right Whale Mortality and Serious Injury Due to Entanglement to Some Degree, the Size of the Reduction Is Unclear

The Commonwealth has highlighted its weak rope requirement as a key element of its conservation strategy for the right whale. Although the Take Reduction Team had endorsed the weak rope requirement before Massachusetts implemented its own regulation, Massachusetts implemented the requirement for Massachusetts state waters for the 2021 season without waiting

for the federal government to issue a final rule. Day 10 Trial Tr. 114:20–115:1. Massachusetts contends that it is leading on the requirement as part of its process for “front-loading” those regulations that will be required for the issuance of an Incidental Take Permit from NMFS. Id. at 114:11–19.

Massachusetts lobstermen can comply with the Commonwealth’s new rope requirement in one of two ways. First, they can purchase rope that is uniformly less than 1,700-pound strength. Id. at 154:13–15. Second, they can insert lower strength “sleeves” into the top seventy-five percent of a rope every sixty feet. See Day 10 Trial Tr. 152:23–155:5; Ex. 232.

Massachusetts contends that “[u]se of 1,700[-]lb breaking strength rope in fishing will reduce the probability of mortality and suffering to right whales and humpback whales by entanglement by at least 72%.” Comm.’s Prop. Findings of Fact ¶ 131 [#577]. In support of this claim, Massachusetts relies on a 2015 article by Ms. Knowlton titled “Effects of fishing rope strength on the severity of large whale entanglements.” See Ex. 1122 at 326 (“Based on the limited number of whales found entangled in tested rope strengths below . . . 1700 lbs., implementation of [reduced breaking strength] ropes would likely reduce the probability of mortality and suffering by at least 72% . . . and potentially bring entanglement-related deaths to legally mandated levels”).

The conclusion that use of weak rope will reduce right whale “mortality and suffering” by seventy-two percent is not supported by the data included in Ms. Knowlton’s article. The figure is based on the following data: “of the 60 right and humpback whales, 9 right whales and 8 humpback whales, or 28% of the total, were found in estimated breaking strength rope of 1,700 lbs. or less.” Comm.’s Prop. Findings of Fact ¶ 131 [#577] (citing Ex. 3001A (showing both estimated and new 1,700-lb-breaking strength for right whales and humpback whales; Day 7

Trial Tr. 22:12–23:22). Based on this observation, the article concludes that by eliminating ropes with breaking strength of more than 1,700 pounds, the other seventy-two percent of entanglement cases never would have occurred. Day 9 Trial Tr. 173:9–20. The court cannot credit this conclusion where the article does not discuss what percentage of ropes in the whales’ habitat have a breaking strength of more than 1,700 pounds versus those with less than 1,700 pounds. To illustrate the problem, if, in reality, twenty-eight percent of the ropes in the whales’ habitat are weak ropes, the observation that twenty-eight percent of entanglements are associated with weak rope would tend to suggest that the likelihood of entanglement is only a function of the prevalence of weak versus strong ropes in the water, not their strength. Only if significantly less than twenty-eight percent of the total ropes in the whales’ habitat have a breaking strength of less than 1,700 pounds would the twenty-eight percent entanglement rate suggest that there was a greater risk of entanglement in strong versus weak ropes, and even then, it would not suggest that a weak rope requirement would reduce entanglement by seventy-two percent.

Even though Ms. Knowlton’s article does not have the data necessary to draw a conclusion between the strength of rope in the water column and the likelihood of an entanglement, it does suggest some correlation between rope strength and the severity of entanglements. For instance, Minke whales, the smallest species studied, were found entangled in significantly lower breaking strength ropes than humpbacks and right whales. Day 7 Trial Tr. 11:5-9; Ex. 1122 at 325. This finding is consistent with the Commonwealth’s argument that right whales can break free of weaker rope (whereas Minke whales cannot). Day 7 Trial Tr. 12:14–19; Ex. 582 fig. 2a; Ex. 1122 at 326 (discussing whether smaller whales “evade entanglement” or die in stronger gear and go undetected). Similarly, juvenile right whales were found in lower strength ropes than adult right whales. Day 7 Trial Tr. 12:20–25; Ex. 582fFig. 2b; Ex. 1122 at

326. Finally, right whales and humpback whales entangled in stronger rope showed more severe injuries than those entangled in lower strength rope. Day 7 Trial Tr. 16:14–17:15; Ex. 1122 fig. 2.¹⁸ Taken together, these findings do tend to suggest that the use of weak rope may have beneficial effects.

The court must qualify this finding as preliminary and subject to further investigation, however, based on several methodological concerns. First, the authors of the article had a limited and perhaps unrepresentative dataset from which to work. While Ms. Knowlton’s entanglement database includes over 1,600 entanglement events for the right whale, for only thirty of these entanglements were the ropes retrieved (and thus studied here). Ex. 1122 at 318, 320–21. Second, and related to the small sample size, “although there appeared to be an increasing trend in breaking strengths versus severity (Fig. 2d), these differences were only significant when comparing minor to severe injury cases ($t = 2.155$, $df = 16$, $P = 0.02$).” *Id.* at 324; see also Day 6 Trial Tr. 146:2–9; Day 7 Trial Tr. 18:15–19, 61:19–62:1. Third, where multiple ropes were retrieved from an animal, the authors counted only the strength of the strongest rope. Day 7 Trial Tr. 51:1–14; Ex. 1122 at 320. While the court credits Ms. Knowlton’s explanation for this methodological choice, the result has the effect of treating an animal entangled with multiple ropes as being entangled with a single rope (and possibly overstating the damage or injury caused by the single “counted” rope). Fourth, the court credits Dr. Moore’s concern that, because

¹⁸ Indeed, while both Dr. Sharp and Dr. Moore expressed concerns with the Commonwealth’s interpretation of Ms. Knowlton’s article, both agreed that, all else being equal, lower breaking strength rope should tend to reduce the likelihood of serious injuries and mortalities. Dr. Sharp agreed that widespread use of weak rope will potentially reduce fatal entanglements and severe injuries associated with entanglement for right whales. Day 4 Trial Tr. 96:4–7. Likewise, Dr. Moore agreed that a weak rope requirement would “to some degree” reduce the risk of mortality and serious injury to right whales. Day 9 Trial Tr. 193:13–22.

right whales appear to be getting substantially smaller (and thus weaker), any suggestion that right whales may be able to break free from weak rope is already out of date. Day 9 Trial Tr. 125:24–127:22. Fifth, for some of their analyses, the authors assigned the ropes the strength they had when new, as opposed to an estimate of how strong the ropes were at the time of entanglement. Day 7 Trial Tr. 49:23–50:1, 126:18–127:3. As a result, the study may be omitting cases where rope weaker than 1,700 pounds entangled whales. While none of these methodological concerns are fatal, collectively they each undermine the confidence that the court can place in the article’s results.

But even if the court were to put aside these methodological concerns and take the article’s findings at face value, there are three important limitations on any conclusions that may be drawn.

First, even if use of weak rope were universally implemented in Massachusetts state waters, moderate- and serious-injury entanglements will continue. In fact, as Plaintiff identifies, of the thirty right whale entanglements, three occurred with 1,700-lb rope. *Id.* at 120:22–25. Of those, two caused severe injuries and one caused moderate injuries. *Id.* at 121:1–4.¹⁹ Both Dr. Moore and Dr. Sharp testified regarding why this may be. Dr. Moore testified that if the entangled rope has a long draw length—meaning the distance the rope moves in contact with the skin—the rope becomes “like cheese wire” and will “start cutting in” to the surface of the whale,

¹⁹ As another example, Dr. Moore testified about a case in which an eleven-year-old female adult that was found dead in Virginia with rope knitted into its baleen, furrowed into its nostril, and wrapped around its left flipper. Day 9 Trial Tr. 112:18–113:21. Dr. Moore’s team submitted the ropes to testing with NMFS, and NMFS concluded that none of the ropes had a breaking strength of greater than 900 pounds. *Id.* at 114:9–16. Nevertheless, because the new estimated breaking strength exceeded 2,000 pounds, this mortality event is not counted in Ms. Knowlton’s article in the 1,700-pound category.

so “[i]n fact, the skinnier ropes cut in more than the fatter ropes do.” Day 9 Trial Tr. 96:15–97:6. Dr. Sharp also testified regarding the “drastic implications” of friction’s role in entanglement injuries, explaining that when whales become ensnared in constricting wraps of rope, “especially around their flippers, we see that line actually—basically saw[] through the tissues, if it’s there chronically [s]o it cuts through the skin and then the blubber and the muscle.” Day 4 Trial Tr. 54:15–55:21. These injuries can cause the whale flippers and flukes to “completely necrose and devitalize.” Id.

Second, the court credits the evidence that use of weak rope will not reduce the likelihood of entanglements that harass whales and cause minor or moderate injuries and may not reduce lethal entanglements of juvenile whales. See Ex. 1122 at 326 (authors of the Knowlton study acknowledging that the use of reduced breaking strength rope “would not reduce the number of encounters between whales and gear and may not prevent lethal entanglements in some areas such as the right whale calving grounds, where neonates have less strength than a minke whale”). While the court credits the Commonwealth’s argument that Massachusetts is not a breeding ground for right whales, lessening the risk to neonate whales, see Day 7 Trial Tr. 25:8–26:8, the court also credits the testimony that, even if neonates are rarely found in Massachusetts state waters, juvenile whales frequent Massachusetts state waters, and the weak rope requirement may confer no benefit to these animals, Ex. 578 ¶ 15; see also Day 4 Trial Tr. 82:19–83:1, 94:3–15, 99:15–100:2; Ex. 578 ¶ 14.

Third, Massachusetts’ proposed regulations allow fishers to comply with the weak rope requirement either by using uniformly weak rope or by inserting weak “sleeves” into stronger rope to lower its breaking point. Day 10 Trial Tr. 152:23–155:5; Ex. 232 (“This may be achieved by fishing specially manufactured buoy lines with a custom 1,700-pound breaking strength or by

inserting NOAA Fisheries approved contrivances into the top 75% of the buoy line every 60'. At this time, the only approved contrivance is the so called 'South Shore Sleeve'). Mr. Daniel McKiernan, Director of the Division of Marine Fisheries, testified that "most fishermen" opted to insert weak sleeves into existing strong rope rather than purchase specially manufactured rope that is uniformly weak in strength. Day 10 Trial Tr. at 154:6–19 ("Most fishermen, because of the cost, opted to splice or weave in pieces of this weak rope into sections of the vertical line"). While the inserts may prove beneficial under certain circumstances if the weak point will allow the whale to break free, it is also possible, as Dr. Moore explained, for the rope to be wrapped in such a way that the weak point is never stressed to the breaking point and yet the whale becomes entangled. Day 9 Trial Tr. 103:14–21. ("[I]f you've got a multiple wrap around a flipper or a jaw and it [has] a weak point in the middle of that wrap, it's really not going to do much, because it's not going to be under any tension, because the rope—either side of it is going to back up and support the tension without ever getting to the weak point").

In sum, the court credits Ms. Knowlton's article to the extent that it concludes that weaker ropes are, all else equal, less likely to cause death or serious injury to whales that become entangled in the ropes. For that reason, the Commonwealth's implementation of a weak rope requirement most likely reduces the risk that entangling ropes will cause death or serious injury. However, the effect size of any threat reduction is, at best, unclear and may prove to be quite moderate. Moreover, nothing in the article suggests that a weak rope requirement will reduce the likelihood of entanglements that harass or moderately injure right whales.

2. The Decision Support Tool Relied Upon by Massachusetts Demonstrates Only a Minor Reduction in Risk Due to the Division of Marine Fisheries' Recent Regulations

In determining whether the combination of Massachusetts' conservation efforts would confer the target risk reduction goals, Massachusetts relied on NMFS' Decision Support Tool. Day 5 Trial Tr. 127:16–23. The Decision Support Tool was developed by Dr. Burton Shank of the Northeast Fisheries Science Center. Day 7 Trial Tr. 71:11.²⁰

Dr. Shank explained that the Decision Support Tool works by essentially overlapping two different “heat” maps. One map includes information about fishing effort and gear configuration in specific locations.²¹ This information comes primarily from state and federal trap reporting and other sources of information on gear configurations or fishing effort. Id. at 75:2–5. The second map is a whale habitat model, supplied by the Duke University Geospatial Ecology Laboratory, that predicts the densities of whales in different locations and at different times. Id. at 75:12–16; Ex. 1031 (Appendices to Draft Environmental Impact Statement) at 3-2. While the Decision Support Tool has room for improvement, the court credits Dr. Shank's testimony that it relies upon the best available data for its various inputs. Day 7 Trial Tr. 115:3–11. These two maps are multiplied to produce a threat score for a particular location and time. Id. at 77:11–23, 79:10–80:7; Ex. 1031 at 3-2–3-17 (explaining operation of Decision Support Tool). The threat score values are unitless and thus do not speak to an absolute level of risk. However, by running the Decision Support Tool using different management plans (e.g., combinations of time-period

²⁰ Dr. Shank has a Ph.D. from Boston University, with an emphasis on marine ecology, and has significant experience with population modeling. Id. at 72:5–73:10.

²¹ Currently, this part of the Decision Support Tool inputs information only about the breaking strength of rope used, although more complex assessments may be anticipated. Id. at 76:13–77:4.

closures and gear configurations), fishery managers can approximate the relative risk with and without the management plan included. Day 7 Trial Tr. 82:8–223.

As previously noted, the Decision Support Tool considers the added (or reduced) threat created by the gear used in its map representing the fishing effort. Presently, the Decision Support Tool uses the breaking strength of rope as the only consideration when assessing gear threat. Id. at 76:16–22 (“There’s the third aspect to it, which is the attempt to assess how gear is differentially potentially dangerous or threatening for entanglement, and that is a derived model that was new to be included in this. It comes from a mixture of information. It’s based entirely around the breaking strength of rope for now, recognizing that it’s a more complex system than that”).²² Dr. Shank expressly provided no opinion on the reliability of the underlying assumptions. Id. at 102:14–18, 103:6–16.

Dr. Shank testified as to the relative risk reduction calculated by the Decision Support Tool for the North Atlantic right whale that may be attributed to Massachusetts’ conservation regulations. Specifically, Dr. Shank provided the following table that, he testified, provided the monthly and total risk reduction to the North Atlantic right whale resulting from Massachusetts’ current management actions.

²² Dr. Shank testified that while breaking strength of the rope was the only consideration for gear threat, he relied upon other data, e.g., the number of traps in a trawl, to estimate the strength of the line used. Id. at 77:7–10.

Final Relative Risk Scores – Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	1.90	0.85	55.3 %
2	RelativeRisk_Threat	2	0.13	0.05	59.1 %
3	RelativeRisk_Threat	3	0.73	0.05	92.5 %
4	RelativeRisk_Threat	4	6.45	0.11	98.3 %
5	RelativeRisk_Threat	5	31.94	0.07	99.8 %
6	RelativeRisk_Threat	6	0.15	0.09	41.6 %
7	RelativeRisk_Threat	7	0.02	0.01	44 %
8	RelativeRisk_Threat	8	0.14	0.09	32.7 %
9	RelativeRisk_Threat	9	0.50	0.31	36.9 %
10	RelativeRisk_Threat	10	0.02	0.02	27.6 %
11	RelativeRisk_Threat	11	0.10	0.07	27.9 %
12	RelativeRisk_Threat	12	5.81	3.08	46.9 %
13	RelativeRisk_Threat	Total	47.89	4.81	90 %

Ex. 1169 at 17; Day 7 Trial Tr. 90:14–22. To orient the reader, each row provides a relative risk score under a default scenario (the “default” column) and under specific conservation plans (the “scenario” column). The “reduction” column provides the percent reduction between the “default” and the “scenario.” The results are calculated by month and as a total. Massachusetts relies on the results from this analysis to conclude that “[t]he overall relative risk reduction score for the Massachusetts regulations, assuming compliance with the requirement to use weaker rope, is 90%.” Comm.’s Prop. Findings of Fact ¶ 230 [#577] (citing Ex. 1169 at 17).

While the court credits the Decision Support Tool as the best available science and as a useful tool in right whale conservation management, the contention that the tool shows a ninety percent reduction in risk is somewhat misleading. First, the Decision Support Tool’s risk assessments do not distinguish between risk reductions achieved through regulations already in place, most prominently the closure of Cape Cod Bay that began in 2015, and those implemented through the Division of Marine Fisheries’ most recent regulations. Day 7 Trial Tr. 106:3–21,

111:16–20. This is evidenced by the extremely high reductions during the closure months (February to May) as compared to the more moderate reductions during the non-closure months (June to January). Second, because the model can be run only in month-long intervals, it assumes the implementation of the seasonal closure for the entire month of May, even though the closure period has never extended past May 15. *Id.* at 109:8–25; Day 2 Trial Tr. 21:3–8. This is particularly notable as May contains two thirds of the total default threat (31.94/47.89). Third, a significant portion of the Decision Support Tool’s estimated risk reduction is attributable to the weak rope regulations and the estimated threat reduction provided by the Knowlton article. This is evidenced by comparing the results of the Decision Support Tool model that provide lower and upper bounds of the final risk scores:

Variable	Month	Default	Scenario	Reduction
1 RelativeRisk_Threat_Lower	1	5.04	4.61	8.5 %
2 RelativeRisk_Threat_Lower	2	0.39	0.29	25.8 %
3 RelativeRisk_Threat_Lower	3	2.06	0.30	85.5 %
4 RelativeRisk_Threat_Lower	4	16.77	0.61	96.4 %
5 RelativeRisk_Threat_Lower	5	110.36	0.37	99.7 %
6 RelativeRisk_Threat_Lower	6	0.51	0.48	5.4 %
7 RelativeRisk_Threat_Lower	7	0.07	0.07	5.8 %
8 RelativeRisk_Threat_Lower	8	0.55	0.52	4 %
9 RelativeRisk_Threat_Lower	9	1.83	1.75	4.6 %
10 RelativeRisk_Threat_Lower	10	0.10	0.10	3.4 %
11 RelativeRisk_Threat_Lower	11	0.41	0.39	3.4 %
12 RelativeRisk_Threat_Lower	12	18.12	16.95	6.4 %
13 RelativeRisk_Threat_Lower	Total	156.19	26.43	83.1 %

Variable	Month	Default	Scenario	Reduction
1 RelativeRisk_Threat_Upper	1	1.03	0.20	80.6 %
2 RelativeRisk_Threat_Upper	2	0.06	0.01	80.5 %
3 RelativeRisk_Threat_Upper	3	0.38	0.01	96.6 %
4 RelativeRisk_Threat_Upper	4	3.57	0.03	99.3 %
5 RelativeRisk_Threat_Upper	5	13.61	0.02	99.9 %
6 RelativeRisk_Threat_Upper	6	0.06	0.02	68.8 %
7 RelativeRisk_Threat_Upper	7	0.01	0.00	71.4 %
8 RelativeRisk_Threat_Upper	8	0.05	0.02	57.7 %
9 RelativeRisk_Threat_Upper	9	0.20	0.07	63.1 %
10 RelativeRisk_Threat_Upper	10	0.01	0.00	48.6 %
11 RelativeRisk_Threat_Upper	11	0.03	0.02	48.9 %
12 RelativeRisk_Threat_Upper	12	2.77	0.72	73.9 %
13 RelativeRisk_Threat_Upper	Total	21.78	1.13	94.8 %

Ex. 1169 at 18–19. As Dr. Shank explained, these two models examine the uncertainty in the threat model from the relationship between line strength and the threat it poses to the whales. Day 7 Trial Tr. 91:2–5. The table on the left uses the lower confidence bound of the contribution of rope-breaking strength to whale entanglement while the model on the right uses the upper bound. *Id.* at 91:6–16. A comparison of the two tables reveals the extent to which the 2015

closure and the rope strength regulations account for the thrust of the asserted threat reduction; for the non-closure months, using the threat lower bound, Massachusetts' conservation efforts result in only a three to six percent reduction in relative risk.

3. While Ropeless Fishing is Not Feasible Today, the Impediments to Its Use Are Not Technological

“Ropeless fishing”²³ is a system in which a fisher, using an acoustic device, can send a signal to the trap that releases a mechanism that allows either a buoy or the entire lobster trap to pop up. Once the buoy is at the surface, the trap or trawl can be hauled as usual. Day 5 Trial Tr. 108:8–23; Day 10 Trial Tr. 140:24–141:11.

Both Dr. Moore²⁴ and Mr. Glenn testified that the technology for ropeless fishing has been developed. Dr. Moore explained that two different ropeless technologies—developed by competing companies—are fully functional and ready to be used by trained operators in the commercial fishing industry. Day 9 Trial Tr. 150:12–151:21, 154:7–20. Mr. Glenn likewise testified that this “technology has been around for [a]n excess of 20 years.” Day 5 Trial Tr. 108:8–110:24. Indeed, ropeless fishing is already being viably used in commercial fishing operations in other parts of the world, Day 11 Trial Tr. 67:19–23, and the state’s own expert

²³ Ropeless fishing is more accurately called “on-demand fishing,” since it still often incorporates the use of ropes when the trap is being retrieved.

²⁴ Although Dr. Moore’s primary expertise is as a veterinarian, he has some expertise in the area of ropeless fishing, as he has served as the former chair and current vice chair of the Ropeless Consortium. Day 9 Trial Tr. 144:17–18. Dr. Moore described the Ropeless Consortium as an aggregation of information and people interested in the question of ropeless fishing. In addition to his role on the Ropeless Consortium, Dr. Moore has been a member of a SeaWorld Conservation Fund grant to study ropeless technology. *Id.* at 144:17–18, 145:11–23. As part of his involvement with the grant, Dr. Moore has worked with engineers and salespeople from ropeless fishing companies, as well as with commercial fishers, to improve the efficiency and reliability of the gear. *Id.* at 150:23–151:8.

witness, Ms. Knowlton, opined that ropeless fishing was “the ultimate solution,” Day 7 Trial Tr. 134:24–135:11.

While the technology for ropeless fishing exists, its widescale deployment in Massachusetts coastal waters faces substantial challenges. The court credits Mr. Glenn’s testimony that the high density of gear in Massachusetts coastal waters and the overlap of multiple competing mobile gear fisheries for groundfish, sea scallops, and surf clams creates unique implementation challenges for ropeless fishing. Day 5 Trial Tr. 108:24–109:7; Day 10 Trial Tr. 129:12–14; Ex. 547 at 3. Most critically, without the benefit of vertical buoy ropes, commercial fishers—including both fixed-gear fishers and mobile-gear fishers—will have trouble detecting not only where their gear is, but also where others have placed gear. Day 5 Trial Tr. 109:8–110:24; Day 9 Trial Tr. 151:22–152:4; Day 10 Trial Tr. 129:19–23. This can create “gear conflict,” which occurs when one fisher places his gear (e.g., a trawl) on top of another fisher’s gear. Day 10 Trial Tr. 128:11–15. Gear conflict also occurs when a dragger or a dredge goes through lobster gear and moves or damages the gear. *Id.* at 128:16–22.²⁵ Vertical buoy ropes alleviate these types of gear conflicts because they provide fishers with real-time and accurate indicia of other gear location and type.

Potential solutions exist. One would be to “zone” the ocean for particular types of gear or fisheries in order to avoid conflicts. Day 11 Trial Tr. 82:23–83:11. Another would be to mark the

²⁵ The court heard conflicting testimony as to whether on-demand fishing systems would provide fishers with more or less accurate indications of the location of the underwater gear as compared to vertical buoy ropes. Multiple witnesses testified that fishers place a significant amount of slack in the vertical buoy ropes to reduce the likelihood of the buoys breaking away in strong tides or winds. Given this testimony, it is not plain that the vertical buoy ropes provide a more accurate location of the underwater gear as compared to GPS used in conjunction with ropeless fishing systems.

gear using an electronic map in lieu of a buoy. Id. at 51:17–52:2. But each of these potential solutions remains untested, and substantial work remains to be done to successfully implement ropeless fishing technology. See e.g., id. at 68:11–16. What is certain, however, is that a transition to ropeless fishing would be expensive for Massachusetts fishers. Despite the technology having been commercialized for approximately two decades, each ropeless device or trap would cost fishers approximately \$4,000 upfront. Id. at 66:4–14. For fishers that fish the maximum 800 traps and use twenty-pot trawls, the upfront costs would be no less than \$160,000.²⁶ As the state notes, the cost to equip a single such lobster fisher would equal nearly one percent of the total net revenue of the fishery.

4. Massachusetts Has Taken Steps to Obtain an Incidental Take Permit

Massachusetts has taken steps to apply for an Incidental Take Permit. See, e.g., Comm.’s Tenth Status Report [#569] (summarizing efforts to obtain an Incidental Take Permit, including the creation of a Habitat Conservation Plan for the North Atlantic right whale). In 2020, the Division of Marine Fisheries sought to have the American lobster fishery in Massachusetts state waters reclassified as its own fishery rather than as part of the Northeast/Mid-Atlantic American lobster fishery. Ex. 116; Ex. 225. This reclassification would allow NMFS to specifically consider Massachusetts’ conservation strategies, as distinct from those of the other constituencies making up the Northeast/Mid-Atlantic fishery, when deciding whether to issue a permit. Day 6 Trial Tr. 10:10–22.

²⁶ Director McKiernan testified that it was unclear whether a ropeless device would be needed at each end of the trawl. If so, this would double the upfront costs. In addition, these prices exclude the costs of the “pinger” that would be required to release the popup buoy. Id. 66:4–14.

Notably, in its 2021 BiOp for the American lobster fishery, NMFS noted that although the Take Reduction Plan regulations promulgated under the Marine Mammal Protection Act (“MMPA”) applied in both state and federal waters, NMFS was not making a jeopardy determination for state waters and that, “to obtain authorization for incidentally taking ESA-listed marine mammals, such as right whales, states must apply for an ESA section 10(a)(1)(B) [I]ncidental [T]ake [P]ermit for state fisheries.” Exhibit 671 at 480–81. NMFS recognized that any Incidental Take Permit application would have to include “conservation plans” that set forth efforts by the state fishery to mitigate the impacts of its fishery on the listed species.

D. Massachusetts Lobster Fishery and Massachusetts Lobster Fishers

Massachusetts lobstermen directly “land” approximately \$80-100 million worth of American lobster per year. Ex. 1124; Ex. 3005. Of this, approximately \$50-55 million of the total landings are attributable to fishing that occurs in Massachusetts state waters. Day 8 Trial Tr. 98:15–21; Ex. 3005. The Commonwealth introduced evidence that the Massachusetts state waters lobster fishery has a margin rate of approximately thirty-two percent annually, Day 8 Tr. 109:12–23, meaning that of the \$50-55 million in gross revenue, the Massachusetts lobster fishery derives approximately \$16-17 million in net revenue each year, *id.* at 110:4–7.

Massachusetts’ closure of its state waters from February 1 until at least April 30 of each year has not appreciably reduced lobster landings from Massachusetts state waters as there is limited lobster fishing in state waters during that time. Day 2 Trial Tr. 62:4–24; Day 6 Trial Tr. 44:20–46:21, 49:4–11. In fact, the state has calculated that, while individual cases varied, the landings during the closure period accounted for only 1.6% of the average annual revenue for the fishery. Day 6 Trial Tr. 46:15–21.

Beyond the direct net revenue to Massachusetts fishers derived from lobster fishing in Massachusetts state waters, Massachusetts fishers support local onshore businesses that interact with fishers, such as the marine industry, restaurants, lobster dealers, and even tourism. The parties did not submit direct evidence of the size of the indirect economic benefits of the American lobster fishery in Massachusetts and beyond but instead submitted testimony from small business owners that depend on the lobster industry for a substantial portion of their business. While the court cannot put a dollar value on these indirect economic effects, the court generally credits the testimony from these small business owners that a closure of the Massachusetts state lobster fishery would substantially undermine the sustainability of their businesses. Day 8 Trial Tr. 63–70, 88.

The court also credits evidence submitted by both the Commonwealth and the Fund that the state’s lobster industry provides benefits that cannot be reduced to a dollar figure. The lobster fishing industry is dominated by small businesses, *id.* at 140:24–25, 141:1–12, and lobster fishing offers a way of life for many individuals. Specifically, many commercial lobstermen grew up exposed to commercial fishing and have known no other occupation or culture for their entire lives. *Id.* at 17–18, 20–21, 39–40, 138–39; Day 10 Trial Tr. 27–31. Moreover, commercial lobster fishing is unique insofar as it allows young individuals without a formal education to work in the industry and to work their way up to becoming business owners with their own vessels and businesses. Day 8 Trial Tr. 41–42, 84–86; Day 10 Trial Tr. 27–28, 37–39. And for some commercial lobstermen, despite the challenges and dangers presented by their work, the independence and ability to work outside of an office brings them a sense of satisfaction that they would not be able to find anywhere else. Day 8 Trial Tr. 20:20–21:3, 24:1–7, 40:9–18,

41:9–42:11, 77:17–78:1 81:1–6, 88:23–89:25, 145:8–21; Day 10 Trial Tr. 30:3–19, 31:11–24, 38:10–39:10, 46:22–47:4.

The court also credits testimony from Dr. Seth Macinko,²⁷ who opined that the commercial lobster industry plays a significant part in Massachusetts' history and culture and that the loss of the commercial fishery would push the culture in some Massachusetts coastal communities from one that is based around the lobster industry itself (and the characteristics of those who participate in the industry) towards one based upon nostalgia for when that earlier culture existed. Day 8 Trial 147:24–148:17, 149:2–22. Such a change might correspond with a homogenization of society and the loss of a regional culture maintained in Massachusetts communities such as Gloucester for nearly 400 years. Id. at 20:9–12, 148:10–149:5.

While substantial evidence was submitted as to the economic and non-economic importance of the American lobster fishery to Massachusetts, it remains disputed whether a prohibition on the use of vertical buoy ropes will render lobster fishing unviable in the long term. And where the American lobster fishery is but one of many fisheries that sustain the state's economy and cultural heritage, see Ex. 1124 at 4, it is unclear whether the concerns expressed by Dr. Macinko and the commercial fishers would materialize in full.

²⁷ Dr. Macinko is an associate professor at the University of Rhode Island in the Department of Marine Affairs. The court qualified Dr. Macinko as an expert in the field of the effect of management policies on fishing people and fishing communities and in the field of the human dimensions of fisheries management. Day 8 Trial Tr. 119:2–7, 137:1–19; Ex. 1069.

III. Conclusions of Law

A. *Preliminary Matters*

1. This Lawsuit Does Not Challenge Defendants' Regulatory Scheme for Recreational Fishers

Defendants contend that, at trial, Plaintiff surprised them by introducing evidence of recreational fishing as a basis for establishing Defendants' liability under Section 9 of the ESA. Comm.'s Prop. Conclusions of Law 18-19 [#576]. Defendants contemporaneously objected to the introduction of this evidence, and the court reserved ruling on the objection. Day 6 Trial Tr. 63–64.

Defendants make two arguments for why any claim related to recreational fishing would be improper. First, Defendants contend that the court does not have jurisdiction to hear any claim under Section 9 related to recreational fishers because Plaintiff's sixty-day notice letter, submitted pursuant to 16 U.S.C. § 1540(g)(2)(A)(i), did not reference recreational fishing.²⁸ Second, Defendants contend that Plaintiff failed to adequately plead that he was claiming liability based upon Defendants' licensing of the recreational fishery. For the reasons discussed below, the court finds that the sixty-day notice requirement did not limit this case to the commercial fishery but that the Amended Complaint [#68] gave notice to Defendants only that Plaintiff was alleging liability (and seeking remedies) based upon Defendants' conduct related to the commercial fishery.

²⁸ The Defendants otherwise stipulate that Plaintiff satisfied his sixty-day notice requirement in relation to the commercial fishing operations licensed by Defendants. See Day 2 Trial Tr. 126:7–128:13; Jt. Pretrial Mem. 9 [#451].

a. Sixty-Day Notice Requirement

“The citizen suit provision of the ESA requires sixty days notice of intent to bring suit.” Water Keeper All. v. U.S. Dep’t of Def., 271 F.3d 21, 29 (1st Cir. 2001) (citing 16 U.S.C. § 1540(g)(2)(A)). The notice requirement in environmental statute citizen suits is applied “strictly.” Id. Since the notice provision “provides agencies with an opportunity to resolve the dispute and take any necessary corrective measures before a resort to the courts,” any notice “must adequately inform the agency of the exact grievances against it.” Id. at 29-30.

Plaintiff’s sixty-day notice, see Ex. 603, put Defendants on notice that Plaintiff was alleging that the Commonwealth’s regulation of both the recreational and commercial lobster fisheries violated the ESA. Without differentiating between the commercial and recreational fisheries, the notice alleged that Defendants were “violating the ESA Section 9 prohibitions by licensing and regulating the deployment of fishing gear in US coastal waters that kill, injures and otherwise takes endangered species of whales and sea turtles currently listed as protected under the ESA” by “requiring that the lobster pot fishermen you license [] use vertical buoy ropes on their gear.” Id. The only specific reference to commercial fishing occurs on page two of the letter, where Plaintiff states that “[t]he deployment of commercial fishing gear licensed and regulated by [the named recipients] *also* violates the ESA Section 9 prohibitions [on] . . . altering and otherwise destroying the ESA listed designated critical habitats and otherwise essential marine habitat for ESA listed species of endangered whales and sea turtles.” Id. at 2 (emphasis added). This reference to commercial fishing gear in the context of Plaintiff’s habitat modification claim does not negate the remainder of the document where Plaintiff plainly and directly challenged all ropes licensed or permitted by Defendants.

b. Plaintiff's Amended Complaint

Fed. R. Civ. P. 8(a)(2) requires that a complaint contain “a short and plain statement of the claim showing that the pleader is entitled to relief” While courts must always construe pleadings generously, particularly where, as here, the pleading was prepared by a pro se litigant, and must put substance over form, the backstop to the liberal pleading standards is a “defendant’s inalienable right to know in advance the nature of the cause of action being asserted against him.” Rodriguez v. Doral Mortg. Corp., 57 F.3d 1168, 1171 (1st Cir. 1995).

Here, the Amended Complaint [#68] focused on commercial fishing operations and failed to convey that recreational fishing was at issue. First, the factual allegations preceding the causes of action primarily concerned commercial fishing operations. See Am. Compl. 1 [#68] (“the Defendants’ past and prospective killing of Right Whales incidental to commercial marine fisheries”); id. at 13 (“Examples of ESA Listed Endangered Species of Whales and Sea Turtles that are Adversely Affected by Commercial Fishing”). In listing “commercial and recreational anthropogenic activities” harming whales throughout their habitat, Plaintiff mentions commercial, but not recreational, fishing. Id. at ¶ 54 (“the Endangered Whales and Sea Turtles are routine[sic] killed, injured and their reproduction impaired by commercial and recreational anthropogenic activities. . . . includ[ing] in part commercial fishing, vessel traffic and harbor operations, chemical pollution, disposal of plastic debris, and noise pollution”). Second, although Count I (the operative count) recounts that, in addition to licensing “about 1,000 private individuals to do commercial lobster pot fishing in Massachusetts,” “[t]he State Defendants also license hundreds of other individuals to conduct recreational lobster pot fishing in state waters,” id. at ¶ 66, and speaks generally about the licensing of lobster pot activity without differentiating between commercial and recreational activity, id. ¶¶ at 67-70, the title to Count I identifies

“commercial fishing operations” as the basis for the claim, *id.* at 18 (“COUNT I: Defendants Violation of 16 USC § 1538(a and g): The Fishing Defendants Violation of the ESA Section 9(a) Prohibitions Against the Incidental Taking of Endangered Species of Whales and Sea Turtles Occurring as a Direct Result of their Respective Individual Commercial Fishing Operations”).

Finally, Plaintiff’s Prayer for Relief explicitly limits the relief sought, in relevant part, to a declaratory judgment that Defendants are liable under Section 9 “by taking members of Endangered Species of Whales and Sea Turtles . . . pursuant to their respective commercial fishing operations owing to their requiring the use of Vertical Buoy Ropes” and an order enjoining Defendants from licensing or engaging in further “Lobster Pot and Gill Net commercial fishery operations that could result in entanglement” and enjoining Defendants “from licensing said commercial fisheries operations” *Id.* at 29.

In sum, the court finds that Plaintiff’s Amended Complaint [#68] put Defendants on notice of an ESA claim targeting only the Commonwealth’s licensing of commercial fishing operators. Accordingly, the court will not consider any potential takes caused by recreational fishers in assessing the Commonwealth’s liability under the ESA.²⁹

2. Plaintiff Presented No Evidence Relating to the Secretary of the Executive Office of Energy and Environmental Affairs

Plaintiff has named the Massachusetts Secretary of the Executive Office of Energy and Environmental Affairs (“MEOEEA”) in her official capacity as a Defendant. MEOEEA is a cabinet-level agency; the Department of Fish and Game is an agency within MEOEEA; and the Division of Marine Fisheries is a division within the Department of Fish and Game. The

²⁹ That said, the Commonwealth is on notice that, without an Incidental Take Permit for its recreational fishery, it faces potential liability for incidental takes caused by recreational fishers.

Defendants argue that Plaintiff's evidence at trial pertained only to the Division of Marine Fisheries, and therefore judgment should enter in favor of MEOEEA. Comm.'s Prop. Conclusions of Law 17-18 [#576]. Notably, Plaintiff's Proposed Findings of Fact and Conclusions of Law [#600] make no mention of MEOEEA except to note that the Department of Fish and Game and the Office of Environmental Law Enforcement are within it. See id. at 32, n.155. Accordingly, if Plaintiff has standing, judgment will nonetheless enter in favor of the Secretary of MEOEEA as to claims against her.

B. Statutory Scheme

1. Section 9 of the Endangered Species Act³⁰

Section 9 of the ESA categorically prohibits “any person subject to the jurisdiction of the United States” from “tak[ing]” any endangered species within the United States, the territorial sea of the United States, or upon the high seas. 16 U.S.C. § 1538(a)(1)(B)-(C). Congress broadly defined “take” to mean “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” a protected species. 16 U.S.C. §§ 1532(19), 1538(a)(1)(B); see also Strahan v. Coxe, 127 F.3d 155, 162 (1st Cir. 1997) (“‘Take’ is defined . . . in the broadest possible manner to include every conceivable way in which a person can ‘take’ or attempt to ‘take’ any fish or wildlife”).

The ESA's implementing regulations define “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect.” 50 C.F.R. § 222.102. “Harm” is defined as “an act which actually kills or injures fish or wildlife.” Id. “Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly

³⁰ A further discussion of Section 9 of the ESA is set forth in the court's Memorandum and Order [#610].

impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering.” Id. This definition of “harm” does not substitute for or limit the other terms used in defining a “take” but provides an additional basis for violations; as the Supreme Court explained, “unless the statutory term ‘harm’ encompasses indirect as well as direct injuries, the word has no meaning that does not duplicate the meaning of other words that [the ESA] uses to define ‘take.’” Babbitt v. Sweet Home Chapter of Cmty. for a Great Or., 515 U.S. 687, 697-98 (1995) (upholding a similar construction of “harm” by the United States Fish and Wildlife Service); id. at 702 (quoting Russell Motor Car Co. v. United States, 261 U.S. 514, 519 (1923)) (the “statutory context of ‘harm’ suggests that Congress meant that term to serve a particular function in the ESA, consistent with, but distinct from, the functions of the other verbs used to define ‘take.’ The Secretary’s interpretation of ‘harm’ to include indirectly injuring endangered animals through habitat modification permissibly interprets ‘harm’ to have ‘a character of its own not to be submerged by its association’”).

The ESA not only prohibits the direct take of endangered species but also renders it unlawful for anyone “to attempt to commit, solicit another to commit, or cause to be committed, any offense defined” in the Act. 16 U.S.C § 1538(g). In Strahan v. Coxe, the First Circuit concluded that governmental actors could be found liable under the ESA where “the state has licensed commercial fishing operations to use gillnets and lobster pots in specifically the manner that is likely to result in a violation of federal law.” 127 F.3d at 164. Similarly in this case, Plaintiff does not contend the Commonwealth directly causes takes of endangered species but

rather that it indirectly causes such takes through its regulation of the Massachusetts commercial lobster fishery.³¹

Because the Commonwealth has not obtained an Incidental Take Permit, the question of liability in this case turns entirely on whether the Commonwealth has regulated its commercial lobster fishery in a manner that has and is likely to continue to cause takes of the North Atlantic right whale. See Am. Bald Eagle v. Bhatti, 9 F.3d 163, 166 (1st Cir. 1993). As discussed further below, because of the stringent protections that the ESA provides to protected species and the weight of the factual record showing that entanglement in vertical buoy lines will occur wherever there is an overlap of large aggregations of rope and the whales' habitat and that these entanglements harm and harass the species, Massachusetts' liability in this action follows directly from the facts not in dispute. Nonetheless, the court considers the Incidental Take Permitting process under Section 10 of the ESA in the context of the appropriate remedy for Massachusetts' liability. See Mem. & Order 4-6 [#309].

2. Section 10 of the Endangered Species Act

In 1982, following the Supreme Court's decision in Tenn. Valley Auth. v. Hill, 437 U.S. 153 (1978) ("TVA"), Congress amended the ESA to make it more flexible in application. Namely, Congress provided that the Secretaries of Interior or Commerce could issue "Incidental Take Permits" that exempt actors from liability under Section 9 if they cause a take that was "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Pub. L. No. 97-304, § 6 (Oct. 13, 1982); see 16 U.S.C. § 1539(a)(1)(B). For the purposes of marine

³¹ As discussed further below, Congress has amended the ESA to provide a safe harbor if the take is allowed pursuant to an "Incidental Take Permit." There is no dispute, however, that no Incidental Take Permit has yet issued that would exempt Defendants here from liability under Section 9 of the ESA.

species, the Secretaries have charged NMFS with administering the permitting process. The process and requirements for obtaining such a permit are laid out by statute and regulation. 16 U.S.C. § 1539(a)(2)(B); 50 C.F.R. § 222.307. The applicant must submit a conservation plan that specifies, *inter alia*, the impacts of the proposed take and the steps being taken to minimize and mitigate those impacts. 50 C.F.R. § 222.307(b)(5). If NMFS finds that, by the conservation plan, “the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking” and “the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild,” then NMFS may issue a permit that may also be accompanied by “such terms and conditions as the Secretary deems necessary or appropriate to carry out the purposes” of the incidental take provisions. *Id.* at § 222.307(c).

Meanwhile, Section 7 of the ESA prohibits federal agencies from engaging in conduct that would jeopardize the continued existence of any endangered or threatened species. 16 U.S.C. § 1536(a). Specifically, Section 7(a)(2) requires that “[e]ach Federal agency . . . insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species.” *Id.* at 1536(a)(2). Because the issuance of an Incidental Take Permit by NMFS would conceivably constitute an “action authorized, funded, or carried out by [an] agency,” it follows that the requirements of Section 7(a)(2) must also be met before an Incidental Take Permit is issued. The requirements of the Section 7 consultation are discussed in the court’s Memorandum and Order [#610].³²

³² In brief, they require formal consultation whenever an action under consideration “may affect” a protected species. Ctr. for Biological Diversity v. Ross, 2020 WL 1809465, at *1 (D.D.C. Apr. 9, 2020) (citing 50 C.F.R. § 402.14(a)). If consultation is triggered, the expert agency must then determine whether the action under consideration is likely to “jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.” 50

Accordingly, under the ESA, for Massachusetts to obtain an Incidental Take Permit, the requirements of Section 7 must be met. In large part, the two sections are concordant: both require a finding that the action under consideration will not jeopardize the species, and both allow for an expert agency to issue such terms and conditions that the agency concludes to be necessary to carry out the purposes of the ESA. However, under Section 7, regardless of whether jeopardy is found, if the expert agency concludes that incidental take of protected species is likely, the agency is required to issue an Incidental Take Statement. Ctr. for Biological Diversity v. Ross, 2020 WL 1809465, at *3 (D.D.C. Apr. 9, 2020). The legislative history of the 1982 amendment explains that “the purpose of section 7(b)(4) . . . is to resolve the situation in which a federal agency or a permit or license applicant has been advised that the proposed action will not violate section 7(a)(2) of the [ESA] but the proposed action will result in the taking of some species incidental to that action.” H.R. Rep. 97-567, 97th Cong., 2nd Sess., at 26, reprinted in 1982 U.S.C.C.A.N. 2807, 2826 (May 17, 1982).

For an Incidental Take Statement to issue, a federal agency, or a permit or license applicant, must not only be found to comply with the ESA but also, in the case that the incidental take would be of marine mammals, with the MMPA. 16 U.S.C. § 1536(b)(4)(C) (“if an endangered species or threatened species of a marine mammal is involved, the taking is authorized pursuant to section 1371(a)(5) of this title); see also Ctr. for Biological Diversity, 2020 WL 1809465, at *3 (concluding that “if take is reasonably certain,” the Incidental Take Statement “*must confirm that any take complies with both the ESA and the MMPA*”) (emphasis added). As discussed in the court’s Memorandum and Order [#610], compliance with the MMPA

C.F.R. § 402.14(h)(1). If jeopardy is found, the expert agency may issue conditions under, and only under, which the action may proceed. Id. at § 402.14(h)(2).

requires the expert agency to conclude that any “incidental mortality and serious injury from the commercial fisheries will have a negligible impact” on the depleted species. 16 U.S.C. § 1371(a)(5)(E)(i)(I).

The term “negligible impact” is not defined by the MMPA; however legislative history suggests that the term “negligible” takes on its dictionary definition, meaning “an impact which is able to be disregarded” or “so small or unimportant or of so little consequence as to warrant little or no attention.” H.R. Rep. No. 97–228, at 19 (1981) (referencing Webster’s Dictionary definition). In policy statements, NMFS has stated that it would “as a starting point . . . consider[] a total annual serious injury and mortality of not more than 10 percent of a stock’s Potential Biological Removal (‘PBR’) level to be insignificant.” 60 Fed. Reg. 45,399, 45,400 (Aug. 31, 1995). As noted above, PBR refers to the mortality rate that a species can withstand without impeding the potential for recovery. Day 1 Trial Tr. 17:8–13; Day 5 Trial Tr. 82:16–23; Ex. 104 at 22 (April 2020 Stock Assessment report, defining PBR). The PBR for the North Atlantic right whale has never been greater than one animal per year, see Ex. 1030 at 2-28, and has been exceeded by takes sourced to the American lobster fishery alone for all but one of the last twenty-five years, id. at 2-37; see also Day 1 Trial Tr. 20:21–21:5.

C. Liability

To prevail, Plaintiff must demonstrate by a preponderance of the evidence (1) that the Commonwealth’s activities have caused a take of endangered species and (2) that take is likely to occur in the future due to the Commonwealth’s activities. Am. Bald Eagle, 9 F.3d at 166. Plaintiff argues that the evidence presented at trial satisfies this standard.

Defendants respond with three central arguments. First, Defendants contend that Plaintiff has failed to prove a take that can be sourced to Massachusetts. Second, they contend that very

few entanglements—approximately one in four — should actually be considered “takes” under the ESA since they do not cause injuries of “some significance.” Third, they argue that, even if the Commonwealth has caused takes of right whales in the past, future takes are unlikely due to Massachusetts’ specific efforts to address the problem, namely the Cape Cod Bay closure period and the implementation of its weak rope requirement.

As discussed further below, the court finds that it is more probable than not that Massachusetts-licensed ropes have caused entanglements of right whales that amount to a take under the ESA and that entanglements will continue so long as Massachusetts continues to permit the deployment of tens of thousands of vertical buoy ropes into Massachusetts coastal waters. Those facts are enough to establish Massachusetts’ liability under the strict prohibitions of Section 9 of the ESA. See id.

To the extent that Massachusetts seeks relief from the strict application of the law, the ESA provides no room for the court to excuse liability for the Commonwealth’s ongoing Section 9 violations. To do so would unlawfully usurp the role of the qualified experts at NMFS, whom Congress has tasked with the responsibility of assessing whether the incidental takes caused by the Commonwealth’s lobster fishery may be excused without undermining the purposes of the ESA.

1. Plaintiff Provided Direct and Circumstantial Evidence of Entanglements Caused by Massachusetts-Permitted Gear

Defendants contend that Plaintiff failed to prove that a North Atlantic right whale has been entangled in Massachusetts-permitted gear during the period covered by the statute of

limitations.³³ But Plaintiff did provide both direct and circumstantial evidence of such entanglements.

Plaintiff submitted direct evidence of a 2016 take of a North Atlantic right whale sourced to Massachusetts-licensed lines.³⁴ In the 2016 incident, a right whale was found 6.5 miles north of Cape Cod (thus 3.5 miles into federal waters) entangled in lobster-pot fishing gear. The entangling gear was most likely licensed by the Commonwealth.³⁵ Defendants also argue that there was no evidence that the whale was harmed or harassed by the entanglement because it was eventually freed from the entangling rope without any observable injury. Comm.'s Prop. Conclusions of Law 32 [#576]. However, for the reasons discussed in the next section, a take of an endangered whale occurs when the whale is entangled by gear, even in the absence of observable trauma.

³³ The court assumes a six-year statute of limitations for purposes of this action where, during pretrial proceedings, the Fund asserted that a six-year statute of limitations applies, see Fund's Motion in Limine to Preclude Old Evidence 1 [#403] (citing Man Against Xtinction v. Comm'r of Me. Dep't of Marine Resources, 478 F.Supp. 3d 67, 70 n.2 (D. Me. 2020)), the court directed Plaintiff and Defendants to provide legal support if either contended a different statute of limitations applied, see Elec. Order [#473], and neither side offered any contrary legal authority.

³⁴ Plaintiff also points to 2017 and 2018 entanglements as direct evidence of Massachusetts-caused takes. However, as discussed in the findings of fact, there is not a preponderance of evidence associating these entanglements with Massachusetts ropes. Nonetheless, as discussed further below, these entanglements do demonstrate the presence of North Atlantic right whales in or near Massachusetts state waters throughout the year.

³⁵ The Commonwealth argues that Mr. Glenn "did not affirmatively testify that the entanglement was in Massachusetts waters." Comm.'s Prop. Conclusions of Law 30 [#576]. However, the court understood Mr. Glenn to testify, consistent with the affidavits previously submitted by Division of Marine Fisheries staff, the responses to the requests for admission, and NMFS' records, that the whale was entangled by a line set in Massachusetts state waters. The Commonwealth also argues that it is possible that the gear was placed by a recreational fisher as opposed to a commercial fisher and even that the gear was not placed in compliance with Massachusetts regulations. While certainly plausible, the court finds, based on the total number of lines placed, that it is far more likely that the gear was placed by a commercial fisher.

The record also includes circumstantial evidence—much of it undisputed—that supports Plaintiff’s claim. It is uncontroverted that North Atlantic right whales are frequently entangled in vertical buoy ropes to the point where nearly all remaining animals show markings consistent with a wrap or abrasion severe enough to leave a conspicuous scar on the animal. See e.g., Ex. 104 at 25 (study documenting 1,032 unique “entanglement events” on 626 individual whales, where 83% of the right whales had had an entanglement event severe enough to leave a detectable scar and 59% of right whales had evidence of more than one entanglement scar). Further undisputed is that Massachusetts’ regulatory scheme for commercial fishers produces approximately 80,000 potentially entangling lines in Massachusetts’ coastal waters. And it is undisputed that despite seasonal migration patterns, the North Atlantic right whales are present each year during those periods when Massachusetts state waters are open to commercial fishing. The best science—the science relied upon by the Commonwealth and NOAA Fisheries—presumes that where whales and vertical buoy ropes share the same waters, entanglements will occur.

Pointing to rope retrieved from entangled whales since 2013, Defendants argue that over seventy percent of all serious injury and mortality events have occurred in rope greater than a half inch in diameter whereas Massachusetts-licensed commercial fishers only use endlines that are three-eighths inch or smaller in diameter. Moreover, Defendants note that in the twenty-four of eighty-nine cases in which NOAA Fisheries was able to determine a country of origin for specific gear, twenty of those cases were sourced to the Canadian snow crab fishery. But this evidence is too limited to undermine the circumstantial evidence of entanglements, as set forth above. First, as to the rope size, Defendants draw their statistics from a total of fifteen ropes retrieved from entangled whales since 2013, while in “the vast majority” of entanglements, the

gear is not retrieved. Day 6 Trial Tr., 38:25–39:1; see Ex. 1135. Second, the evidence of certain gear being attributable to the Canadian Snow Crab fishery demonstrates only that that gear is uniquely identifiable; it has no bearing on the identity of most of the gear involved in entanglements. Finally, statistics regarding ropes found in serious injury and mortality events do not help elucidate the origins of ropes found in entanglements that, as discussed below, may not be categorized as leading to serious injury or mortality but nonetheless amount to a taking for purposes of the ESA. See, infra, Part III(c)(2). Finally, even if the evidence cited by Defendants suggests that Massachusetts commercial fishers are not responsible for the *majority* of serious injury and mortality events involving North Atlantic right whales, Massachusetts is nevertheless liable for those entanglements that it does cause. Indeed, none of the statistics cited by Defendants suggest that sources other than Massachusetts are *solely* responsible for North Atlantic right whale entanglements, just that sources other than Massachusetts are the primary identified source. That others may be more responsible than Massachusetts for entanglements may provide a relevant equitable consideration, but it is largely irrelevant to the determination of whether Massachusetts is liable under the ESA.

Because entanglements occur under water some distance from shore, they are rarely seen. Indeed, even though rope scaring is endemic, the offending ropes are hardly ever recovered and, even when they are, they are rarely sourced to a specific fishery. Considering the size of the Massachusetts lobster-pot fishery and the prevalence of North Atlantic right whales in Massachusetts state waters when those waters are open to commercial fishing, the court concludes, based on the circumstantial evidence and the direct evidence addressed above, that it is more likely than not that right whales are entangled in vertical buoy ropes licensed by the Commonwealth.

2. Entanglements That Do Not Cause Moderate or Serious Injuries Are Takes Under the Endangered Species Act

Defendants argue that the majority of entanglements—namely the seventy-five percent of documented “minor” entanglement events where there is at least some kind of wrap or abrasion but the injury to the animal does not penetrate all the way to the animal’s blubber or muscle—do not give rise to potential liability under the ESA. Comm.’s Prop. Conclusions of Law 32 [#576]. While this argument does not address the twenty-five percent of documented entanglement events where the injury does penetrate to the animal’s blubber or muscle,³⁶ the argument, if correct, would reduce the likelihood that the Commonwealth will cause future takes to occur.

Defendants’ argument that “minor” entanglements cannot, as a matter of law, constitute a “take” under the ESA is mistaken as a matter of both law and fact. As a matter of law, Defendants erroneously contend that for an injury to an endangered species to constitute a Section 9 violation, the injury must be of “some significance.” Comm.’s Prop. Conclusions of Law 25 [#576]. While Defendants do not define what type of injury would have “significance,” they imply that wraps or abrasions that are substantial enough to scar the animal do not necessarily satisfy this standard. As previously discussed, the ESA’s definition of “take” is broad, see 16 U.S.C. § 1532(19), and the First Circuit has noted that Congress defined “take” “in the broadest possible manner to include every conceivable way in which a person can ‘take’ or attempt to ‘take’ any fish or wildlife,” Coxe, 127 F.3d at 162. The Supreme Court has observed

³⁶ The Commonwealth does not dispute that the remaining twenty-five percent of documented entanglement events—those categorized as moderate or severe—constitute takes under the ESA. Indeed, the Commonwealth’s expert, Ms. Knowlton, has acknowledged that these injuries have “some health implications for reproductive females” and can cause “a decline in their health.” Day 6 Trial Tr. 136:18–20. The Commonwealth instead contends, as discussed above, that Plaintiff cannot prove that the Commonwealth is responsible for any of these entanglement events.

that “the seriousness with which Congress viewed this issue” is reflected in the ESA’s provisions: “Virtually all dealings with endangered species . . . were prohibited.” TVA, 437 U.S. at 180; see also Babbitt, 515 U.S. at 698 (reiterating “the broad purpose of the ESA”).

Notably, the Supreme Court held that the Fish and Wildlife Service reasonably defined “harm”—which appears within the definition of “take” but is not independently defined in the ESA—to encompass indirect as well as direct injuries, including “significant habitat modification that actually kills or injures wildlife.” Babbitt, 515 U.S. at 696–704, 708.³⁷ Here, while the injuries to the animals may be classified as “minor” by the New England Aquarium because they are not “moderate” or “severe,” they are nonetheless injuries that caused harm to the animal.³⁸ And while courts within and beyond this circuit have considered the significance of the harm, those considerations have universally taken place within the court’s consideration of whether to exercise its authority to impose injunctive relief for an alleged violation. See, e.g., Animal Welfare Inst. v. Martin, 623 F.3d 19, 29 (1st Cir. 2010) (finding that the district court did not abuse its discretion in denying a permanent injunction where the court found that the

³⁷ The Commonwealth argues that because the regulatory definition of “harm” includes “significant habitat modification” and the regulatory definition of “harass” includes annoying the animal to such an extent “as to significantly disrupt normal behavioral patterns,” the harm caused must itself be “significant.” But while the regulatory definitions use the term “significant” to describe the actionable degree of habitat modification and behavioral changes, they did *not* modify the broad statutory definition of or the level of harm or injury necessary to constitute a take under the ESA.

³⁸ The abrasions and wraps, even in the absence of lacerations that penetrate blubber or muscle, likely also constitute Section 9 violations as a form of harassment and as a capture of the whale. See Strahan v. Holmes, 595 F.Supp.2d 161, 165 (D. Mass. 2009) (finding that there has been a Section 9 violation when a whale is entangled “for at least some period of time” as the term “capture” must be read broadly as is “take”); cf. Animal Welfare Inst. v. Martin, 588 F.Supp.2d 70, 98 (D. Me. 2008) (finding a Section 9 violation when a lynx was harmlessly and temporarily trapped, as trapping that causes harm is subsumed under the term “trap”).

violation had only a negligible impact on the species); Strahan v. Sec’y, Massachusetts Exec. Off. of Energy & Env’t Affs., 519 F.Supp.3d 65, 68 (D. Mass. 2021), appeal docketed, No. 21-1154, (reviewing cases).

More fundamentally, Defendants’ argument that entanglements that do not result in lesions that cut into muscle or blubber are not “of significance” to the animals is not supported by the record. The court heard and credited testimony that, even when whales do break free from rope and gear without moderate or serious injury, the drag created by the gear can place large metabolic demands on the animals. This increased metabolic demand is deleterious not just for individual North Atlantic right whales but for the species, since it can reduce a calving mother’s ability to reproduce and nurse its young. In addition to the effects caused by drag, the court heard and credited testimony that the ropes can become entangled in the animals’ baleen and blowholes, interfering with their ability to feed and breathe. All these interactions with this critically endangered species constitute the types of human-caused harms that the ESA was designed to end and are not de minimis or merely technical violations of the law.

3. Effects of Massachusetts Conservation Efforts on the Likelihood of Future Takes

Finally, Massachusetts argues that the potential for future entanglements in Massachusetts-licensed ropes is insufficient to rise to the level necessary to establish liability under the ESA. Namely, Massachusetts contends that the risk of entanglement during the Cape Cod Bay closure period is close to zero—a point that Plaintiff does not contest—and that during the period when the closure is not in effect (approximately May 15 to January 31), the potential for entanglement is “very low” due to the reduced whale activity. Comm.’s Prop. Conclusions of Law 40 [#576]. In addition, Massachusetts points to efforts it has taken to reduce the likelihood

of entanglement during the lobstering season, most prominently its winter closure and the weak rope requirement.

While it is uncontroverted that entanglement risk is substantially lower outside the Cape Code Bay closure period due to dispersal of the right whales around mid-May of each year, it is also uncontroverted that whales are present in and near Massachusetts state waters year-round. Considering the density of vertical buoy ropes in Massachusetts coastal waters during this time, those right whales that do travel through the area face a real risk of entanglement. Cf. Dist. 4 Lodge, 2021 WL 5317196, at *7 (“A large number of whales can certainly pose a significant risk in the presence of even relatively few lines, but just a few whales can also pose a significant risk in the presence of a large number of lines”). While the record does not establish a numerical probability for the likelihood that a take will occur, all indications suggest that it is all but certain that “actual harm” will befall these solitary right whales that travel Massachusetts’ coastal waters outside the closure period. Cf. Am. Bald Eagle, 9 F.3d at 165 (rejecting numerical probability standard for “actual harm” standard). Indeed, there is hard evidence of these solitary animals becoming entangled outside the closure period. For example, the 2016 Cape Cod Bay entanglement was first spotted in September 2016, months after the closure went into effect.³⁹ In addition, the two whales found in 2017 and 2018 to have drowned in cases of acute entanglements in or near Massachusetts state waters were entangled months after the closure

³⁹ The record is somewhat unclear as to when the animal involved in the September 2016 entanglement was entangled. The animal was first spotted in September 2016. See Ex. 1112 at row 239. During his testimony, Mr. Glenn stated that the animal was entangled in September 2016, during the open fishing season. Day 1 Trial Tr. 70:5–8. The court understands Mr. Glenn’s testimony to be his inference that the whale was most likely entangled not too long before it was first spotted with the attached gear. The court credits this inference.

period ended. As discussed previously, while it is an open question as to whether the 2017 and 2018 entanglements can be fairly tied to the Massachusetts commercial lobster fishery, the entanglements demonstrate the risk of even solitary right whales becoming entangled outside the closure period in and near Massachusetts state waters.

Recognizing entanglement risk outside the closure period (what the Division of Marine Fisheries refers to as “dispersed risk”), Massachusetts has continued to take steps to reduce the risk of entanglement during that time. The most prominent of these efforts is its weak rope requirement.⁴⁰ However, for the reasons discussed above, while the reduced rope strength rules are likely to reduce, though certainly not eliminate, the probability of serious injury and mortality from entanglements, they have not been shown to reduce the likelihood of entanglements generally. The Commonwealth’s Decision Support Tool analyses show that when conservative assumptions about the effectiveness of the weak rope requirement are input into the analysis—and only conservative assumptions are proper, considering the limited evidence presently available—the risk reduction during the open period is minor.

For these reasons, the court concludes that Plaintiff has established by a preponderance of the evidence that the Commonwealth has caused incidental takes of endangered whales and that the Commonwealth is likely to continue to cause incidental takes of endangered whales going forward. And because the Commonwealth has not obtained an Incidental Take Permit for these

⁴⁰ In addition, Massachusetts has taken other steps to reduce the risk to North Atlantic right whales during the open season. This includes requiring rope no thicker than three-eighths inches, encouraging the use of more traps per trawl, and gradually reducing the number of licenses available for lobstermen. While these steps may reduce the likelihood of entanglement, Defendants acknowledge that the weak rope requirement is the “core” of its efforts to reduce entanglement risk during the open season. Comm.’s Prop. Conclusions of Law 40 [#576].

takes, the Commonwealth is in violation of Section 9 of the ESA. The court now turns to remedies.

D. Remedy

1. The Court's Finding of Liability Requires Consideration of Appropriate Equitable Relief

Where, as here, a private plaintiff brings a citizen-suit action alleging a violation of the ESA, the plaintiff's relief is limited to injunctive relief. Ctr. for Biological Diversity v. Marina Point Dev. Co., 566 F.3d 794, 804 (9th Cir. 2009) ("The ESA allows a citizen suit for the purpose of obtaining injunctive relief only").

Plaintiff has argued, and argues here, that when there is an ongoing violation of the ESA, a federal district court is duty bound to immediately enjoin that conduct. Pl.'s Prop. Findings of Fact & Conclusions of Law 130-31 [#600]. Plaintiff relies on the Supreme Court's holding in TVA, 437 U.S. 153, which Plaintiff contends "parallels" this case. Id. In TVA, the Court held that, although equitable remedies usually involve a "balancing of equities and hardships," where Congress has plainly stated—in the form of the ESA—that Congress' highest priority is the protection of endangered species, the court shall not second-guess Congress by performing its own evaluation of the equities. Id. at 184.

But, as the court previously ruled in its Memorandum and Order [#309] denying Plaintiff's request to enjoin immediately the use of vertical buoy ropes in Massachusetts state waters, there are critical factual and legal differences between TVA and the case at bar. Factually, in TVA, the district court concluded that, absent an injunction, a proposed dam would "either eradicate the known population of snail darters or destroy their critical habitat." Id. at 171. Indeed, the Supreme Court noted that this finding of fact was not seriously in dispute. Id. As the First Circuit has explained, "the drastic result in [TVA] stemmed from the strong and

undisputed showing of irreparable harm that would occur absent an injunction: an entire species would become extinct.” Animal Welfare Inst., 623 F.3d at 27 (citing United States v. Oakland Cannabis Buyers’ Co-op., 532 U.S. 483, 496–97 (2001); Weinberger v. Romero-Barcelo, 456 U.S. 305, 314 (1982)).

There is also an important legal distinction. At the time that TVA was decided, the ESA lacked a process to permit takes. Indeed, Congress amended the ESA to make it more flexible in application in response to the Court’s decision in TVA. That amendment included the creation of the Incidental Take Permit provision in Section 10. By enacting this exception to the ESA’s otherwise stringent prohibition on takes of endangered species, Congress made plain that it distinguished certain takes from others. That is, without amending Section 9’s absolute prohibition on takes of endangered species, Congress declared that an actor may be permitted to cause takes under the narrow circumstances delineated above.

Plaintiff cites two Supreme Court cases that followed TVA that, he argues, reaffirm the holding in TVA that courts do not have equitable discretion to fashion injunctive relief under the ESA. Pl.’s Prop. Findings of Fact & Conclusion of Law 132-34 (citing Weinberger, 456 U.S. 305); Oakland Cannabis, 532 U.S. 483). But those cases reaffirm the principle that “[u]nless a statute in so many words, or by a necessary and inescapable inference, restricts the court’s jurisdiction in equity, the full scope of that jurisdiction is to be recognized and applied.” Weinberger, 456 U.S. at 313 (quoting Porter v. Warner Holding Co., 328 U.S. 395, 398 (1946)). And while both Weinberger and Oakland Cannabis noted that the court’s equitable jurisdiction was curtailed under the specific circumstances present in TVA, they did not hold that that federal courts were without discretion to fashion equitable relief in all ESA cases.

Post-TVA decisions in this circuit support the conclusion that an injunction enjoining all challenged activity need not automatically follow a finding of a likelihood of liability under the ESA.⁴¹ Indeed, in Strahan v. Coxe, Plaintiff made this same argument to the First Circuit and lost. 127 F.3d at 171. There, as here, the district court concluded, on Plaintiff's motion for a preliminary injunction, that Massachusetts' licensing of vertical buoy ropes in state waters resulted in "a strong likelihood that endangered whales will be 'taken' in violation of the ESA." Strahan v. Coxe, 939 F.Supp. 963, 989 (D. Mass. 1996). However, the court granted Plaintiff's requested injunction only in part, denying his request to immediately enjoin Massachusetts' licensing of vertical buoy ropes in state waters. On appeal, Plaintiff argued, as he does here, that "the Court in TVA ruled that injunctive relief is mandatory upon a finding of a violation of the ESA." Coxe, 127 F.3d at 171. The First Circuit upheld the denial of the requested relief, stating that the district court had discretion to fashion other relief so long as it ensured "that any violation would end." Id.

First Circuit decisions since Coxe have reaffirmed that principle. The First Circuit has made plain that judges are to apply the traditional four-part test before granting an injunction, notwithstanding a finding of a likelihood of liability. See Animal Welfare Inst., 623 F.3d at 27 (collecting cases for the proposition that "[t]his circuit has consistently applied the traditional tests for preliminary injunctions in ESA cases"); see also Water Keeper All., 271 F.3d at 34 (holding that the presumption in favor protected species cannot "blindly compel" an outcome in

⁴¹ Each of these cases addressed the question of preliminary relief, but "[t]he standard for a preliminary injunction is essentially the same as for a permanent injunction with the exception that the plaintiff must show a likelihood of success on the merits rather than actual success." Amoco Prod. Co. v. Vill. of Gambell, AK, 480 U.S. 531, 546 (1987).

favor of endangered species where the sought-after injunction would implicate national security).⁴²

However, because the ESA reflects Congress' finding that, as a matter of policy, it will be the objective of the United States to put a halt to the extinction of species, considerations of the balance of hardships and the public interest do not start out in equipoise but are "tip[ped] heavily in favor of protected species," Coxe, 127 F.3d at 160 (quoting Nat'l Wildlife Fed'n v. Burlington N. R.R., 23 F.3d 1508, 1510 (9th Cir. 1994)) (internal quotation mark omitted), or in other words, "Congress has placed its thumb on the scale for the whales," Dist. 4 Lodge, 2021 WL 5317196, at *1.

2. Plaintiff is Not Entitled to an Immediate Permanent Injunction Barring All Vertical Buoy Lines in Massachusetts State Waters

Plaintiff seeks to enjoin all licensure of vertical buoy ropes in state waters. Considering the relevant factors, the court finds such relief unwarranted at this time.

The First Circuit's recent decision in a case seeking a stay of a district court's injunction against NMFS' recently issued rule implementing a new seasonal closure off the Maine coast offers some support for Plaintiff's request. The First Circuit explained that if takes of North Atlantic right whales continue unabated, there will be irreparable injury, namely, "the extinction of a marine mammal species." Id. at *7. While the First Circuit recognized that the closure of a portion of federal waters off the Maine coast from October to January each year would present "a

⁴² These four factors are whether: (1) the plaintiff suffered an irreparable injury; (2) remedies available at law, such as monetary damages, are adequate to compensate for that injury; (3) the balance of hardships between the plaintiff and defendant warrants a remedy in equity; and (4) a permanent injunction would not hurt the public interest. Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 156-57 (2010) (citing eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 391 (2006)).

major financial hardship” and “certain risk of economic harm” for those who set traps annually in the restricted area and to the plaintiffs, it found these were outweighed by the “increased risk of impeding Congress’ aims and increasing right whale fatality[.]” Id. at *8.

The First Circuit decision differs from the instant dispute, however, in several ways. First, NMFS’s action at issue before the First Circuit focused on the period when right whales aggregated in certain federal waters, whereas the injunction sought by Plaintiff here would cover the period when whales appear in Massachusetts state waters singly, and not in aggregation. There is logic to Plaintiff’s request: due to the small number of North Atlantic right whales remaining, the death or serious injury of a single animal is a momentous occasion for the species, and while endemic sublethal harms caused by entanglements that do not cause serious injury or mortality are individually less likely to create an insult to the species from which it will be unable to recover, collectively they too contribute to the numerous and significant pressures on the species. Nonetheless, the urgency of the threatened harm to the right whales is lessened where Massachusetts has already closed its waters during periods of aggregation. That is, while Massachusetts’ existing regulatory scheme has and continues to cause takes of North Atlantic right whales, this is not a case where, absent an immediate injunction enjoining all use of vertical buoy ropes in Massachusetts state waters, the North Atlantic right whale will be immediately and gravely impacted.

Second, the harm to lobster fishers caused by the closure of those federal waters from October to January each year is of a lesser magnitude than an injunction barring deployment of vertical buoy ropes in Massachusetts state waters all year, which would devastate those Massachusetts communities and businesses that are centered on lobster fishing. While the evidence at trial suggests that, in time, the lobster fishery may eventually deploy ropeless fishing

technology, the evidence also established that that technology is not likely to be able to be implemented in short order. And while an immediate injunction may accelerate the implementation of that technology, it is not clear whether the fishers, their businesses, and the communities that rely on them would survive the period between an immediate injunction and the day that ropeless technology becomes practical.

Third, and most critically, “[w]here an ongoing ‘regulatory process offers an alternative means of ensuring statutory compliance without the burden of an injunction,’ ‘the public interest favors a less intrusive . . . role’ for a court considering injunctive relief,” Ctr. for Biological Diversity v. Ross, 480 F.Supp.3d 236, 253 (D.D.C. Aug. 19, 2020) (quoting Garnett v. Zeilinger, 313 F.Supp.3d 147, 161 (D.D.C. 2018)), at least in the first instance. Indeed, in balancing the harms posed by a stay of federal agency action taken to protect the right whale, the First Circuit specifically noted the likely “irreparable harm in the form of preventing a federal agency from undertaking its congressionally assigned task of assuring the right whales are protected from a critical risk of death.” Dist. 4 Lodge, 2021 WL 5317196, at *8. Here, where the relief requested by Plaintiff would take that congressionally assigned task away from the federal agency while Massachusetts is engaging that agency through the Incidental Take Permit process, the public interest favors allowing that federal agency process to continue.

In sum, the court finds an immediate, permanent injunction barring all vertical buoy ropes in Massachusetts state waters unwarranted.

3. Plaintiff is Entitled to an Injunction Requiring Massachusetts to Diligently Seek an Incidental Take Permit

Plaintiff persuasively argues that the district court’s decision in Coxe not to issue an immediate injunction tells a cautionary tale. Even though the Commonwealth was ordered to

obtain an Incidental Take Permit in 1997, its application was denied and, since then, the Massachusetts lobster-pot fishery has continued to operate in contravention of federal law.

The court fully credits the Division of Marine Fisheries' efforts to bring Massachusetts into compliance with the ESA. Nonetheless, without an Incidental Take Permit, Defendants remain in violation of Section 9. While the Division of Marine Fisheries is now engaged in renewed efforts to obtain an Incidental Take Permit, those efforts did not commence until the court issued a preliminary injunction. That fact strongly supports continued court oversight.

Plaintiff makes strong arguments for why an Incidental Take Permit is unlikely to issue. While the court may agree that issuance of an Incidental Take Permit is unlikely, that determination needs to be made in the first instance by the federal agency charged with that task. Accordingly, if the First Circuit concludes that Plaintiff has standing, the court will enter an injunction directing the Division of Marine Fisheries to continue its good faith efforts to obtain an Incidental Take Permit, and in the event that these efforts are finally rejected, to cease permitting the deployment of vertical buoy ropes in Massachusetts state waters.

IV. Conclusion

For the foregoing reasons, if the court's decision on standing were reversed and the case remanded, the court would enter the findings of fact and conclusions of law set forth above. Further, the court would enjoin the Division of Marine Fisheries to continue its good faith efforts to obtain an Incidental Take Permit and, in the event that those efforts were finally rejected, to cease permitting the deployment of vertical buoy ropes in Massachusetts state waters.

November 30, 2021

/s/ Indira Talwani
United States District Judge