UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

MAN AGAINST XTINCTION ("MAX") a.k.a. RICHARD MAX STRAHAN,

Plaintiff,

v.

SECRETARY, MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS ("MEOEEA"), *et al.*,

Defendants,

and

MASSACHUSETTS LOBSTERMEN'S SURVIVAL FUND,

Intervenor.

C.A. No. 19-cv-10639-IT

**Leave to File Granted**
**September 17, 2021**

# PLAINTIFF'S *CORRECTED* PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

# TABLE OF CONTENTS

# TABLE OF AUTHORITIES

**Page(s)**

**Cases**

**Statutes**

**Regulations**

**Other Authorities**

# I. INTRODUCTION

This case boils down to one undeniable fact: the use of vertical buoy lines for trap/pot fishing (primarily lobster fishing) along the Atlantic seaboard is inconsistent with the specific requirements of the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA) for the North Atlantic right whale. For over 25 years, the National Marine Fisheries Service (NMFS), the Massachusetts Division of Marine Fisheries (DMF), and other state agencies have tried and failed to reconcile the use of vertical buoy lines with the federal laws requiring the reduction of anthropogenic mortality and serious injury to right whales. Meanwhile, the North Atlantic right whale is in freefall, with the frequency and severity of entanglements only rising. The Commonwealth's continued licensure of a fishing technique known to kill, injure, and prevent the reproduction of this millennia-old mammal violates the law.

But a solution exists. With investment in the gear-conflict question, ropeless technology could be fished year-round in all Massachusetts waters—including Cape Cod Bay. All of the experts who testified at trial agree that a move to ropeless fishing is an eventual necessity for the species' long-term survival. The remaining issue is one of political will: the lobster industry resists the new technology, so the Commonwealth spends millions of dollars editing the margins—splicing weak inserts into ropes, flying planes over Massachusetts waters, and attempting to free whales from entanglements. But this "stay the course" mentality buys the species nothing. A dramatic shift is necessary to save the iconic whale, and this Court has not only the power but the legal obligation to force the change the Commonwealth has proved itself incapable of making. Indeed, this case embodies the very purposes of both an independent judiciary and the Endangered Species Act. The Court can act—unconstrained from the political considerations that bind the Commonwealth—to compel what the law requires: an end to vertical buoy line fishing.

These Findings of Facts and Conclusions of Law are divided into three sections. The first sets forth the relevant statutory and regulatory background necessary to contextualize the facts. Second are the plaintiff's proposed findings of fact. Third, the argument applies the facts to the law.

## II. STATUTORY AND REGULATORY BACKGROUND

1. The laws and regulations that govern protection of endangered and threatened marine mammals (e.g., the North Atlantic right whale) are Byzantine: the Endangered Species Act and the Marine Mammal Protection Act employ separate but related concepts that may be easily confused. In this case, five different, but interrelated, statutory mandates apply and compel an injunction against the use of vertical buoy lines.

2. *ESA § 9 taking*. Section 9 of the ESA prohibits the "taking" of endangered species, making it "unlawful for any person . . . [to] take any [endangered] species within the United States or the territorial sea of the United States . . . [or] take any such species upon the high seas . . . ."[1]

3. *ESA § 10 incidental take permit*. Section 10 of the ESA authorizes the issuance of incidental take permits (ITPs), which exempt a person from liability under § 9 for "takes" of endangered species that are "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."[2] Section 10 sets out a series of requirements for such a permit, including submission of a conservation plan that shows "the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild."[3]

---

[1] 16 U.S.C § 1538(a)(1)(B)–(C).

[2] 16 U.S.C. § 1539(a)(1)(B).

[3] 16 U.S.C. § 1539(a)(2).

4. *ESA § 7 federal action "consultation" and "jeopardy."* Section 7 of the ESA contains a broad mandate that all federal agencies refrain from conduct that jeopardizes the continued existence of any endangered or threatened species.[4] Section 7 sets out an involved process of consultation and review, culminating in the relevant federal agency determining—in the form of an incidental take statement—whether the proposed federal action will jeopardize the continued existence of any endangered species or threatened species (and the conditions needed to achieve that result).[5] Section 7 also requires that any take of a marine mammal be authorized under § 101(a)(5) of the MMPA.[6]

5. *MMPA § 101(a)(5) permits through "negligible impact determination."* As with the ESA, the MMPA contains a broad prohibition on the taking of marine mammals and provides the circumstances for exceptions to that prohibition.[7] Section 101(a)(5) of the MMPA empowers the relevant agency (here, NMFS) to authorize the taking of specified numbers of a marine mammals for set periods of time.[8] The § 101(a)(5) requirements differ as to non-commercial and commercial fishing activities; as to the latter, § 101(a)(5) requires a showing that the "incidental mortality and serious injury from commercial fisheries will have a negligible impact on such species or stock."[9]

6. *MMPA § 118 authorization, and mandates for take recovery plans to meet "potential*

---

[4] 16 U.S.C. § 1536(a).

[5] *Id.* The consultation process involves the formulation of biological opinions, which determine "whether the action, taken together with the cumulative effects, is likely to jeopardize the continued existence of listed species . . . ." 50 C.F.R. § 402.14(h).

[6] 16 U.S.C. § 1536(b)(4).

[7] *See* 16 U.S.C. § 1371(a).

[8] *See* 16 U.S.C. § 1371(a)(5).

[9] 16 U.S.C. § 1371(a)(5)(E)(i).

*biological removal" and "zero mortality rate" goals.* Enacted in 1994, § 118 of the MMPA further elaborates the circumstances under which NMFS may authorize commercial fishing activities.[10] Section 118 contains broad mandates for commercial fisheries to (1) immediately reduce serious injuries and mortality (SI/M) to endangered marine mammals and (2) reduce SI/M to levels approaching zero mortality within seven years (i.e., by 2001).[11] For endangered or threatened marine mammals, if the incidental SI/M from commercial fisheries exceeds the potential biological removal level (PBR), § 118 mandates the preparation of a take reduction plan that "shall include measures the Secretary expects will reduce, within 6 months of the plan's implementation, such mortality and serious injury to a level below the potential biological removal level."[12]

**A. The Endangered Species Act**

7. In 1973, Congress enacted the Endangered Species Act. The ESA declared that the United States pledges itself "to conserve to the extent practicable the various species of fish or wildlife and plants facing extinction."[13] The ESA further "encourag[es] the States and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs . . . for the benefit of all citizens, the Nation's heritage in fish, wildlife, and plants."[14]

8. The ESA is "the most comprehensive legislation for the preservation of endangered

[10] *See* 16 U.S.C. § 1387.

[11] 16 U.S.C. § 1387(a)–(b).

[12] 16 U.S.C. § 1387(f)(5)(A).

[13] 16 U.S.C. § 1531(a)(4).

[14] 16 U.S.C. § 1531(a)(5).

species ever enacted by any nation."[15] The Supreme Court's review of the ESA's "language, history, and structure" established "beyond doubt that Congress intended endangered species to be afforded the highest of priorities."[16] The "plain intent of Congress in enacting th[e] statute was to halt and reverse the trend toward species extinction, whatever the cost."[17]

9. The structure of the ESA is: (1) a general prohibition on the taking of endangered species (§ 9); (2) exceptions to the take prohibition (§ 10); and (3) a general mandate on federal agencies to ensure their actions do not jeopardize endangered or threatened species (§ 7). The Act also provides vehicles for cooperation between federal agencies and the states and international community (§ 6).

**1. Section 9 prohibits "takes" of endangered species.**

10. Section 9 of the ESA seeks to halt the extinction of species and enable their recovery by prohibiting any person from "taking" an endangered species, with only limited exceptions.[18] Section 9 of the ESA made it so that "[v]irtually all dealings with endangered species, including taking, possession, transportation, and sale, were prohibited, except in extremely narrow circumstances."[19]

11. "'Take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[20] "'Take' is defined . . . in the broadest

---

[15] *Tenn. Valley Auth. v. Hill* ("*TVA*"), 437 U.S. 153, 180 (1978).

[16] *Id.* at 174.

[17] *Id.* at 184.

[18] 16 U.S.C. § 1538(a)(1)–(2); *see also* 15 U.S.C. § 1535(g)(2) (setting forth some exceptions); 15 U.S.C. § 1539 (same).

[19] *TVA*, 437 U.S. at 180.

[20] 16 U.S.C. § 1532(19).

possible manner to include every conceivable way in which a person can 'take' or attempt to 'take' any fish or wildlife."[21]

12. Harm in the definition of "take" means "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering."[22]

13. The ESA not only prohibits the direct take of endangered species, but also the "attempt to commit, solicit another to commit, or cause to be committed, any offense defined" in § 9 of the ESA.[23] In *Strahan v. Coxe*,[24] the First Circuit concluded that governmental actors could be found liable under the Act 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."[25]

14. The term "person" includes "any officer, employee, agent, department, or instrumentality . . . [or] any State, municipality, or political subdivision of a State . . . ."[26] "The statute not only prohibits the acts of those parties that directly exact the taking, but also bans those

---

[21] S. Rep. No. 93–307, at 7; *see also Babbitt v. Sweet Home Chapter of Cmtys. for a Great Or.*, 515 U.S. 687, 704–05 (1995) (citing Senate and House Reports indicating that "take" is to be defined broadly).

[22] 50 C.F.R. § 222.102.

[23] *See* 16 U.S.C. § 1538(g).

[24] 127 F.3d 155 (1st Cir. 1997).

[25] *Id.* at 164.

[26] 16 U.S.C. § 1532(13).

acts of a third party that bring about the acts exacting a taking."[27] "[A] governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA."[28]

15. Under the ESA regulatory scheme, the National Marine Fisheries Service—part of the National Oceanic and Atmospheric Administration within the Department of Commerce—is responsible for Cetacea (whales and dolphins) species.[29] The principal duties that the ESA assigns to the Secretary of Commerce for protecting marine species have been delegated to NMFS.[30]

**2. Section 10 authorizes a limited exception to the taking prohibition through the issuance of an incidental take permit.**

16. Under the ESA, the Secretary of Commerce (here, acting through NMFS) may permit the taking of an endangered species if that taking is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."[31]

17. NMFS cannot issue an incidental take permit under § 1539(a)(1)(B) unless NMFS can find that "(i) the taking will be incidental; (ii) the applicant will, to the maximum extent

---

[27] *Coxe*, 127 F.3d at 163.

[28] *Id.*

[29] 16 U.S.C. § 1362(12) (noting Secretary of department under which NOAA is operating has "all responsibility, authority, funding, and duties under this chapter with respect to members of the order Cetacea . . ."); 54 Fed. Reg. 40,338, 40,338 (Sept. 29, 1989) (establishing the NMFS as "responsible for species of the order Cetacea (whales and dolphins) . . ."); *see also* 16 U.S.C. § 1377(a) ("Except as otherwise provided in this subchapter, the Secretary shall enforce the provisions of this subchapter. The secretary may utilize, by agreement, the personnel, services, and facilities of any other Federal agency for purposes of enforcing this subchapter.").

[30] 50 C.F.R. § 222.101(a).

[31] 16 U.S.C. § 1539(a)(1)(B) (allowing for permits for "any taking otherwise prohibited by section 1538(a)(1)(B) of this title if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity"). The ESA also allows for permits for scientific research, not applicable here. 16 U.S.C. § 1539(a)(1)(A).

practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures, if any, required under subparagraph (A)(iv) will be met" and has "received such other assurances as he may require that the plan will be implemented . . . ."[32] The regulations set out procedures for an application for an incidental take permit.[33]

**3. Section 7 requires Incidental Take Statements.**

18. Because NMFS's issuance of an incidental take permit under § 10 is, itself, the act of a federal agency, that action must comply with other provisions of the ESA, most notably § 7. Section 7 of the ESA contains a sweeping command to all federal agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species . . . ."[34] As stated by the Supreme Court, "[o]ne would be hard pressed to find a statutory provision whose terms were any plainer than those in § 7 of the [ESA]," and "[t]his language admits of no exception."[35]

---

[32] 16 U.S.C. § 1539(a)(2)(B). The legislative history of § 10(a) suggests that not "appreciably reduc[ing] the likelihood of the survival and recovery of the species in the wild" is simply another formulation of the § 7(a)(2) jeopardy standard. *See* H.R. Rep. No. 97-835, at 29–30 (1982) (Conf. Rep.), *as reprinted in* 1982 U.S.C.C.A.N. 2860.

[33] 50 C.F.R. § 222.307(b). The Secretary is also required to follow notice and review requirements. 16 U.S.C. § 1539(c).

[34] 16 U.S.C. § 1536(a)(2).

[35] *TVA*, 437 U.S. at 173. The Supreme Court devoted a significant portion of its opinion to discussing the legislative history of § 7 of the Act, noting how efforts to moderate or qualify the language were repeatedly rejected. *TVA*, 437 U.S. at 181–84. Congress responded directly in 1979, changing the uncompromising requirement that federal agencies ensure that any action they undertake "*does not jeopardize* the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species" to

19. Under § 7, the Secretary is required to issue a "jeopardy" or "no jeopardy" opinion before it can authorize take.[36] The term "jeopardize the continued existence of" a species means "engag[ing] in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the *survival and recovery* of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."[37] "Recovery" is defined as "improvement in the status of listed species to the point at which listing is no longer appropriate."[38]

20. If the Secretary finds no jeopardy, the ESA authorizes the Secretary to issue a written statement to the applicable agency called an "incidental take statement," or ITS, under § 7(b)(4).[39]

21. If the Secretary issues a valid, lawful, and binding ITS under § 7(b)(4), then "any taking that is in compliance with the terms and conditions specified in [the ITS] shall not be considered to be a prohibited taking of the species concerned."[40]

22. In sum, the ESA allows a federal agency to grant a § 10 incidental take permit only if the agency's activity is not likely to jeopardize the continued existence of a species or if measures are put in place to avoid that result.

---

the less absolute "*is not likely to jeopardize.*" *See* An Act to Authorize Appropriations to Carry Out Endangered Species Act of 1973 During Fiscal Years 1980, 1981, and 1982, Pub. L. No. 96–159, § 4, 93 Stat. 1225 (1979). *Compare* 16 U.S.C. § 1536(a) (1978) *with* 16 U.S.C. § 1536(a)(2) (1980).

[36] 16 U.S.C. § 1536(b)(3)(A).

[37] 50 C.F.R. § 402.02 (emphasis added).

[38] *Id.*

[39] 16 U.S.C. § 1536(b)(4).

[40] 16 U.S.C. § 1536(o)(2).

**4. The MMPA's more restrictive provisions overlay the ESA's requirements.**

23. With respect to marine mammals, even more is required before a lawful ESA § 10 permit may be issued. Congress enacted the ESA in 1973—the year after it had enacted the MMPA. To ensure maximum sweep of the Act's protective provisions, Congress expressly provided that the more restrictive provisions of either would control.[41] Thus, the MMPA's negligible impact requirement under § 101(a)(5), discussed below, must also be met before NMFS can issue an ESA § 10 incidental take permit.

**5. The ESA allows any person to bring suit to enforce its substantive provisions.**

24. Finally, the ESA provides for private enforcement. The ESA grants any person the right to bring suit "to enjoin any person, including the United States and any other governmental instrumentality or agency . . . who is alleged to be in violation of any provision of [the ESA] or regulation issued under the authority thereof."[42] Under this citizen suit provision, the district courts have jurisdiction "to enforce any such provision or regulation, or to order the Secretary to perform such act or duty, as the case may be."[43] The private enforcement provision contains a 60-

---

[41] 16 U.S.C. § 1543 ("Except as otherwise provided in this chapter, no provision of this chapter shall take precedence over any more restrictive conflicting provision of the Marine Mammal Protection Act of 1972.").

[42] 16 U.S.C. § 1540(g)(1)(A). The act also provides for civil penalties. *Id.* § 1540(a)(1).

[43] 16 U.S.C. § 1540(g)(1). The subsection provides, in relevant part, that "any person may commence a civil suit on his own behalf . . . to enjoin any person, including the United States and any other governmental instrumentality or agency (to the extent permitted by the eleventh amendment to the Constitution), who is alleged to be in violation of any provision of this chapter or regulation issued under the authority thereof . . ." and that the "district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce any such provision or regulation, or to order the Secretary to perform such act or duty, as the case may be." *Id.* § 1540(g)(1)(A), (C). Elsewhere the ESA provides that the "several district courts of the United States, including the courts enumerated in section 460 of Title 28, shall have jurisdiction over any actions arising under this chapter." *Id.* § 1540(c).

day notice requirement.[44]

**B. The Marine Mammal Protection Act**

**1. The objective of the MMPA is to protect marine mammals from harm.**

25. Enacted in 1972, the overriding purpose of the MMPA was the protection of all marine mammals—*to the greatest extent feasible*—including those endangered or threatened under the ESA.[45] The Congressional findings included that "stocks of marine mammals are . . . in danger of extinction or depletion as a result of man's activities," marine mammal species "should not be permitted to diminish below their optimum sustainable population," and "[w]henever consistent with this primary objective, it should be the goal to obtain an optimum sustainable population keeping in mind the carrying capacity of the habitat."[46]

**2. MMPA imposes a moratorium on unlawful taking.**

26. To achieve these objectives, the MMPA places a moratorium on takes of marine mammals.[47] The term "moratorium" means "a complete cessation of the taking of marine mammals and a complete ban on the importation into the United States of marine mammals and marine mammal products, except as provided in this chapter."[48]

27. The MMPA also declares it unlawful to take marine mammals. Specifically, the MMPA states it is unlawful "for any person to use, in a commercial fishery, any means or methods of fishing in contravention of any regulations or limitations, issued by the Secretary for that fishery

[44] 16 U.S.C. § 1540(g)(2)(A).

[45] *See* 16 U.S.C. § 1361(6).

[46] 16 U.S.C. § 1361(6).

[47] 16 U.S.C. § 1371(a).

[48] 16 U.S.C. § 1362(8).

to achieve the purposes of this chapter."[49]

28. The term "take" means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."[50] The term "harassment" means "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."[51]

29. In short, prohibited takings include all non-excepted actions that have the *potential* to kill, injure or disrupt behavioral patterns of marine mammals, including their migration, breathing, breeding, or feeding.[52]

30. The MMPA also requires management agencies (here, NMFS) to identify "depleted" species and prepare conservation plans.[53] It requires NMFS to "prevent the depletion" of marine mammals from incidental take by commercial fisheries.[54]

31. The term "depletion" or "depleted" means any instance where:

> (A) the Secretary . . . determines that a species or population stock is below its optimum sustainable population;

---

[49] 16 U.S.C. § 1372(a)(2)(A), (a)(5). The Act also makes it unlawful in all circumstances to engage in whaling. 16 U.S.C. § 1372(f).

[50] 16 U.S.C. § 1362(13). The regulations elaborate further: "This . . . the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal . . . or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal . . . ." 50 C.F.R. § 216.3.

[51] 16 U.S.C. § 1362(18)(A).

[52] 16 U.S.C. § 1362(13), (18).

[53] 16 U.S.C. § 1362(1).

[54] 16 U.S.C. § 1387(f)(1).

> (B) a State, to which authority for the conservation and management of a species or population stock is transferred under section 1379 of this title, determines that such species or stock is below its optimum sustainable population; or
>
> (C) a species or population stock is listed as an endangered species or a threatened species under the Endangered Species Act of 1973.[55]

**3. MMPA § 101(a)(5) provides limited exceptions to the MMPA's prohibition on takes.**

32. Section 101(a)(5) of the MMPA provides exceptions to the MMPA's bar on taking marine mammals. Relevant here are three exceptions appearing in 16 U.S.C. § 1371(a)(5).[56]

33. *Non-commercial small takes*. One exception to the MMPA's moratorium is for activities other than commercial fishing that "take" a "small number" of marine mammals.[57] Generally, the Secretary may allow, for a period of up to five years, "the incidental, but not intentional, taking by citizens while engaging in that activity within that region of small numbers of marine mammals of a species or population stock if the Secretary . . . finds that the total of such taking during each five-year (or less) period concerned *will have a negligible impact on such species or stock . . . .*"[58]

34. *Non-commercial harassment*. A second exception is for activities other than commercial fishing that take "by harassment" a "small number" of marine mammals. Generally, the Secretary may allow, for periods of no longer than one year, "the incidental, but not

---

[55] 16 U.S.C. § 1362(1).

[56] Inapplicable to this case are the exceptions for scientific research, 16 U.S.C. § 1371(a)(1); for waiver by the Secretary, *id.* § 1371(a)(3)(A), and for efforts to deter harm to marine mammals, *id.* § 1371(a)(4)(A).

[57] 16 U.S.C. § 1371(a)(5)(A)(i).

[58] 16 U.S.C. § 1371(a)(5)(A)(i)(I) (emphasis added).

intentional, taking by harassment of small numbers of marine mammals of a species or population stock by such citizens while engaging in that activity within that region if the Secretary finds that such harassment during each period concerned . . . *will have a negligible impact on such species or stock* . . . ."[59]

35. *Commercial fishing.* A third exception is for commercial fishing. Generally, the Secretary may allow, for periods of up to three consecutive years, commercial fishing operations to incidentally take marine mammals, so long as the Secretary finds that:

> (I) the incidental mortality and serious injury from commercial fisheries will have a negligible impact on such species or stock;
>
> (II) a recovery plan has been developed or is being developed for such species or stock pursuant to the Endangered Species Act of 1973; and
>
> (III) where required under section 1387 of this title, a monitoring program is established under subsection (d) of such section, vessels engaged in such fisheries are registered in accordance with such section, and a take reduction plan has been developed or is being developed for such species or stock.[60]

36. In sum, to be exempt under § 1371(a)(5), there must be (i) a lawful negligible impact determination, (ii) a lawful take reduction plan, and (iii) the taking must otherwise be only "incidental" to the activities in question.

37. To underscore the importance of the negligible impact determination, the MMPA *requires* the responsible federal agency to use emergency powers when a commercial fishery violates this provision:

> *If,* during the course of the commercial fishing season, the Secretary determines that the level of incidental mortality or serious injury

[59] 16 U.S.C. § 1371(a)(5)(D)(i) (emphasis added).

[60] 16 U.S.C. § 1371(a)(5)(E)(i).

> from commercial fisheries for which a determination was made [as described above] (i) has resulted or is likely to result in an impact that is more than negligible on the endangered or threatened species or stock, the Secretary *shall use the emergency authority* granted under section 1387 of this title to protect such species or stock, and may modify any permit granted under this paragraph as necessary.[61]

**4. The MMPA's definition of "negligible impact" is stringent.**

38. A "negligible impact" is one not reasonably likely to impact the growth rate of a species. Until last year, the default quantification of that level was 10% of the potential biological removal for the species. After a policy statement last year, that level has risen to 13% of the potential biological removal for the species.

39. *Legislative history*. The MMPA itself does not define negligible impact. Nonetheless, the House Committee report for the MMPA Amendments of 1981—when the negligible impact standard was added—states that "'negligible' is intended to mean an impact which is able to be disregarded."[62] The committee further observed that Webster's defines the term "'negligible' to mean 'so small or unimportant or of so little consequence as to warrant little or no attention."[63]

40. *The negligible impact regulations*. The regulations enacted to implement § 101(a)(5) define "negligible impact" as having "the same meaning as in § 216.103 of this chapter,"[64] i.e., "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."[65]

---

[61] 16 U.S.C. § 1371(a)(5)(E)(iii) (emphasis added).

[62] H.R. Rep. No. 97–228, at 19 (1981).

[63] *Id.*

[64] 50 C.F.R. § 229.2.

[65] 50 C.F.R. § 216.103.

41. *Regulatory policy and practice*. In 1995, NMFS sought to issue permits to fisheries that have incidental interactions with marine mammal stocks listed as endangered or threatened under the ESA for which the appropriate determinations could be made under § 101(a)(5)(E)(i) of the MMPA. After referring to "negligible impact" regulatory definition in 50 C.F.R. § 216.103, NMFS announced that "it would consider a total annual serious injury and mortality of not more than 10 percent of a stock's PBR level to be insignificant."[66] NMFS noted that this "criterion would not be the only factor" in all instances since "population abundance and fishery-related mortality information provided in the stock assessment reports has varying degrees of uncertainty, and factors other than PBR levels (e.g., population trend, reliability of abundance and mortality estimates) must also be considered."[67]

42. Based on this definition, NMFS was "unable to determine that the mortality and serious injury incidental to commercial fishing operations would have a negligible impact" on several whale populations, including the North Atlantic right whale. NMFS therefore indicated "that no take incidental to commercial fishing was allowed."[68]

43. A recent NMFS policy directive, titled *Criteria for Determining Negligible Impact under MMPA Section 101(a)(5)(E)*, outlines the criteria for calculating negligible impact.[69] The directive explains the history of using 10% of PBR to make negligible impact determinations.[70] The

---

[66] 61 Fed. Reg. 64,500, 64,501 (Dec. 5, 1996).

[67] *Id.* at 64,502.

[68] *Id.*

[69] *See* NMFS Procedure 02-204-02, *Criteria for Determining Negligible Impact under MMPA Section 101(a)(5)(E)* (June 17, 2020), https://media.fisheries.noaa.gov/dam-migration/02-204-02.pdf.

[70] *Id.* at 14–17.

directive then indicates that, for specific fisheries, the default calculation for negligible impact determinations is 13% of the PBR.[71]

44. The policy directive includes a section explaining that: (1) a § 101(a)(5)(E) negligible impact determination is *required* for incidental take authorizations under ESA § 7(b)(4), (2) negligible impact must be analyzed *independently* from the § 7(a)(2) jeopardy analysis, and (3) the negligible impact standard is *different* than the jeopardy determination.[72]

45. NMFS has long "recognize[d] Congressional intent that the 'negligible impact' standard in the MMPA is more stringent than" ESA § 7(a)(2)'s no jeopardy and § 10(a)'s "not appreciably reduce the likelihood of survival and recovery of the species in the wild" standard.[73]

**5. The MMPA's § 118 requires a take reduction plan for exceptions where the marine mammal is a threatened or endangered species.**

46. In addition to meeting the requirements of § 101(a)(5)(E), commercial fisheries must also be authorized under § 118 of the MMPA. To obtain such authorization, NMFS must formulate take reduction plans in accordance with federal mandates.[74]

---

[71] *Id.* at 14.

[72] *Id.* at 14 ("ESA section 7(b)(4) and the joint regulations (50 CFR 402.14(i)(1)) require NMFS . . . to provide an incidental take statement with a biological opinion if it concludes that an action (or implementation of any reasonable and prudent alternatives) and the resulting incidental take of listed species will not violate ESA section 7(a)(2) . . . . Where an endangered or threatened marine mammal species is involved, ESA section 7(b)(4) and the joint regulations *also require* that NMFS or FWS must conclude that any incidental take *is authorized pursuant to section 101(a)(5) of the MMPA* in order to provide an incidental take statement. The conclusion that an action and the resulting incidental take of an ESA-listed species will not violate ESA section 7(a)(2) and the conclusion regarding negligible impact under MMPA 101(a)(5)(E) *are separate and the applicable standards are not the same* . . . a conclusion regarding jeopardy under ESA section 7(a)(2) may inform a conclusion of negligible impact under MMPA section 101(a)(5)(E) but is not necessarily determinative of that decision." (emphases added)).

[73] 61 Fed. Reg. 64,500, 64,502 (Dec. 5, 1996).

[74] 16 U.S.C. § 1387(f)(1).

47. In 1994, Congress made significant changes to the MMPA to address the failure of prior regulatory efforts to protect marine mammals. These changes (§ 118) mandated that incidental mortality and serious injury to marine mammals from commercial fisheries[75] be reduced to insignificant levels approaching zero *by April 30, 2001*.[76]

48. Congress also directed the Secretary to review within three years (by April 30, 1997) the "the progress of all commercial fisheries, by fishery, toward reducing incidental mortality and serious injury to insignificant levels approaching a zero rate" and report to Congress within one year thereafter.[77] Were the Secretary to determine, after the review, that the incidental rate of mortality and serious injury to marine mammals in a commercial fishery was not approaching zero by April 30, 2001, Congress instructed that the "Secretary shall take appropriate action under subsection (f)" relating to the development and implementation of take reduction plans.[78]

49. When a marine mammal is threatened or endangered by a commercial fishery, both § 101(a)(5)(E) *and* § 118 of the MMPA (appearing at 16 U.S.C. §1371(a)(5)(E) and § 1387 respectively) apply.[79] In other words, when commercial fishing operations impact a threatened or

---

[75] 16 U.S.C. § 1362(16) (The term "fishery" means "(A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks.").

[76] 16 U.S.C. § 1387(a)(1) ("In any event it shall be the immediate goal that the incidental mortality or serious injury of marine mammals occurring in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate within 7 years after April 30, 1994," i.e., by April 30, 2001).

[77] 16 U.S.C. §1387(b)(3).

[78] 16 U.S.C. §1387(b)(4).

[79] 16 U.S.C. § 1387(a)(2) ("In the case of the incidental taking of marine mammals from species or stocks designated under this chapter as depleted on the basis of their listing as

endangered species, those operations must satisfy both the negligible impact determination requirements under 16 U.S.C. §1371(a)(5)(E) and the take reduction planning requirements under 16 U.S.C. § 1387.[80]

50. Congress mandated specific quantitative goals that a take reduction plan must achieve and time periods by which to achieve them. "The immediate goal of a take reduction plan for a strategic stock shall be to reduce, within six months of its implementation, the incidental mortality or serious injury of marine mammals incidentally taken in the course of commercial fishing operations to levels less than the potential biological removal level established for that stock."[81] "The long-term goal of the plan shall be to reduce, within 5 years of its implementation, the incidental mortality or serious injury of marine mammals incidentally taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate, taking into account the economics of the fishery, the availability of existing technology, and existing State or regional fishery management plans."[82]

51. As previously explained, the term "potential biological removal level" means "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable

---

threatened species or endangered species under the [ESA] . . . both this section and section 1371(a)(5)(E) of this title shall apply.").

[80] Earlier sections of the MMPA that allowed for regulations and a permitting process were made obsolete as to commercial fishing. 16 U.S.C. § 1387(a)(6) ("Sections 1373 and 1374 of this title shall not apply to the incidental taking of marine mammals under the authority of this section.").

[81] 16 U.S.C. § 1387(f)(2).

[82] *Id.*

population."[83] "The potential biological removal level is the product of the following factors: (A) The minimum population estimate of the stock. (B) One-half the maximum theoretical or estimated net productivity rate of the stock at a small population size. (C) A recovery factor of between 0.1 and 1.0."[84]

52. Congress provided the "Secretary shall give highest priority to the development and implementation of take reduction plans for species or stocks whose level of incidental mortality and serious injury exceeds the potential biological removal level, those that have a small population size, and those which are declining most rapidly."[85]

53. Each take reduction plan must include: "(A) a review of the information in the final stock assessment published under section 1386(b) of this title and any substantial new information; (B) an estimate of the total number and, if possible, age and gender, of animals from the stock that are being incidentally lethally taken or seriously injured each year during the course of commercial fishing operations, by fishery; (C) recommended regulatory or voluntary measures for the reduction of incidental mortality and serious injury; (D) recommended dates for achieving the specific objectives of the plan."[86]

54. The MMPA sets two standards for commercial fisheries where PBR goals are not being met. Where incidental serious injury and mortality from commercial fishing alone exceeds the PBR, Congress mandated the take reduction plan to include measures to reduce mortality and

[83] 16 U.S.C. § 1362(20).

[84] *Id.*

[85] 16 U.S.C. § 1387(f)(3).

[86] 16 U.S.C. § 1387(f)(4).

serious injury below PBR within six months.[87] When incidental serious injury and mortality from all anthropogenic sources exceeds the PBR (i.e., not just commercial fishing), Congress mandated the take reduction plan to include measures "to the maximum extent practicable" to reduce mortality and serious injury below PBR within six months.[88]

55. In sum, only if NMFS finds: (1) that a commercial fishery will have no more than a "negligible impact" on listed marine mammals, (2) that a lawful take reduction plan (that meets the goals of expecting to reduce incidental SI/M below the PBR for all applicable species) is in place, and (3) that other requirements of § 101(a)(5)(E)(i) have been met, can NMFS authorize incidental take by a fishery under the MMPA.[89]

## III. FINDINGS OF FACT

### A. Plaintiff Max Strahan has long advocated for the right whale and provided notice of his intent to bring suit.

#### 1. Mr. Strahan served the Commonwealth with a 60-day notice.

56. On October 1, 2018, Mr. Strahan emailed a letter to the Commonwealth

---

[87] Congress provided that "[f]or any stock in which incidental mortality and serious injury from commercial fisheries exceeds the potential biological removal level . . . the plan shall include measures the Secretary expects will reduce, within 6 months of the plan's implementation, such mortality and serious injury to a level below the potential biological removal level." 16 U.S.C. § 1387(f)(5)(A).

[88] Congress provided that "[f]or any stock in which human-caused mortality and serious injury exceeds the potential biological removal level, other than a stock to which subparagraph (A) applies, the plan shall include measures the Secretary expects will reduce, to the maximum extent practicable within 6 months of the plan's implementation, the incidental mortality and serious injury by such commercial fisheries from that stock. For purposes of this subparagraph, the term 'maximum extent practicable' means to the lowest level that is feasible for such fisheries within the 6-month period." 16 U.S.C. § 1387(f)(5)(B).

[89] 16 U.S.C. § 1371(a)(5)(E)(i)–(ii). Any permit authorizing incidental take must specify the number and kind of animals authorized to be taken, the location and manner in which they may be taken, the period during which the permit is valid, and any other appropriate terms or conditions. 16 U.S.C. § 1374(b)(2)(A)–(D).

defendants, the Massachusetts Office of the Attorney General, and the United States Secretary of Commerce giving notice of his intent to sue the Commonwealth for violations of ESA § 9 resulting from its licensing of VBRs that have caused and continue to cause unlawful takes of endangered species of whales and sea turtles.[90] The Commonwealth has stipulated that such notice was provided.[91]

**2. Mr. Strahan has long advocated for the North Atlantic right whale.**

57. Mr. Strahan is the chief science officer for Calm Earth Corporation.[92] His job is to consider the factors that are required "to ensure [the] birth, feeding, and reproduction and survival [of wildlife] and obviously the minimization or elimination of anthropogenic killings."[93] He has spent approximately sixty hours a week in this position addressing issues related to the North Atlantic right whale over the past year.[94]

58. Mr. Strahan began studying and advocating for the protection of the North Atlantic right whale in the late 1980s.[95] His early conservation efforts entailed assessing the regulatory structure and developing a conservation strategy for the species to be implemented in Massachusetts, including advocating for the creation of a recovery team.[96] Mr. Strahan estimates that 50–60% of his work over the last 30 years has been dedicated to addressing issues related to

[90] Day 2 Trial Tr. 123:18–124:24; Ex. 603.

[91] *See* Day 2 Trial Tr. 126:7–128:13; Joint Pretrial Mem. at 9, ECF No. 451.

[92] Day 2 Trial Tr. 78:18–23.

[93] *Id.* at 78:24–79:8.

[94] *Id.* at 80:6–11.

[95] *Id.* at 81:10–20.

[96] *Id.* at 82:20–86:6.

conservation of the North Atlantic right whale.[97]

**a. Academic Work**

59. Mr. Strahan recently received a master's degree from the University of New Hampshire.[98] His master's thesis, *Goodbye and Thanks for All the Fish: The Inevitable Extinction of Vertebrate Wildlife in the United States by 2021*, included a discussion of the North Atlantic right whale.[99]

60. Mr. Strahan authored a law review article examining the federal regulatory scheme for the protection of large whales titled *A New Paradigm for Conservation of Great Whales in the Urban Sea of the United States: Species in Need of a Green Knight*, which was published in the Boston College Environmental Affairs Law Review in 2009.[100] He was also invited to speak at an MIT-Boston College joint symposium to discuss the article.[101]

**b. Legislative Advocacy**

61. In 1988, Mr. Strahan successfully lobbied the Massachusetts legislature for funding for a North Atlantic right whale research program.[102] He has also lobbied for the Commonwealth to introduce legislation to protect the right whale.[103]

62. For the last ten years, Mr. Strahan has prepared, collected signatures for, and submitted to the Attorney General numerous initiative petitions for measures to protect North

---

[97] *Id.* at 81:5–9.

[98] *Id.* at 72:16–21.

[99] *Id.* at 72:22–73:2, 74:14–16.

[100] *Id.* at 106:25–107:22; Ex. 587.

[101] Day 2 Trial Tr. 107:3–12.

[102] *Id.* at 85:18–86:6.

[103] *Id.* at 86:11–17.

Atlantic right whales, including to ban the use of VBRs and gillnets in Massachusetts waters, to require DMF to assess the impact of regulations on wildlife, to regulate commercial whale watching, to impose additional fees on fishing permits and to sell right whale license plates to fund conservation efforts, and to designate Cape Cod Bay a significant habitat for the right whale.[104]

63. Mr. Strahan has undertaken similar legislative advocacy efforts on behalf of endangered sea turtles, including lobbying the state to adopt a conservation plan and pressing the Commonwealth to enforce the law to protect ESA-listed sea turtle species.[105]

**c. Legal Advocacy**

64. Since 1994, Mr. Strahan has filed 20 to 30 lawsuits to compel enforcement of the ESA, MMPA, and Administrative Procedures Act as part of his advocacy for endangered marine species with the primary goal of implementing of a recovery plan for the North Atlantic right whale.[106]

**d. Public Education and Outreach**

65. Mr. Strahan's work to put initiatives on the ballot has involved engaging the public through outreach and education, including raising public awareness about the critically endangered status of the North Atlantic right whale and the need for laws and regulations to protect the species.[107]

66. Part of Mr. Strahan's efforts to advocate for the strict enforcement of the ESA's § 9

[104] *Id.* at 86:18–88:24, 89:25–90:16.

[105] *Id.* at 97:21–98:3.

[106] *Id.* at 90:17–91:20, 96:3–8.

[107] *Id.* at 87:22–89:11.

prohibitions included outreach with the press.[108]

67. His conservation work on behalf of endangered species of whales and sea turtles has been the subject of multiple articles in major newspapers, including the Boston Globe and the Los Angeles Times.[109]

**e. Scientific Research**

68. Mr. Strahan is known by and regularly engages with members of the scientific community for the purpose of obtaining data on endangered whales and sea turtles and to exchange of points of view.[110]

69. Since the early 1990s, Mr. Strahan has conducted research efforts to evaluate the degree to which endangered sea turtles, especially leatherback turtles, are entangled in Massachusetts waters and assess responsive public policy.[111]

**f. Aesthetic Interest in Whales and Sea Turtles**

70. Mr. Strahan is an avid whale watcher and regularly looks for and hopes to see North Atlantic right whales from boats and when on the coastline of Massachusetts and New Hampshire.[112] He testified about specific plans to see North Atlantic right whales in the future, including in Boston Harbor the day of his testimony and during a whale-watching trip planned for the week following trial.[113]

---

[108] *Id.* at 92:11–14, 93:11–13.

[109] *Id.* at 104:6–13, 104:19–24; Ex. 465; Ex. 467; Ex. 468; Ex. 473.

[110] Day 2 Trial Tr. 112:13–25.

[111] *Id.* at 91:21–92:10, 97:4–20.

[112] *Id.* at 119:4–121:5.

[113] *Id.* at 120:1–121:5.

71. Mr. Strahan regularly looks for endangered sea turtles when he walks along the beaches of Massachusetts. He has seen a dead leatherback turtle and would like to see a live one.[114]

**g. Spiritual Connection to Endangered Species**

72. Mr. Strahan has a spiritual connection to whales, believing that it is his religious duty as a sentient being to protect life on the planet Earth, prevent extinction of wildlife, and preserve biodiversity, regardless of the adverse impact on his society, himself, or his species. He believes doing so is a "spiritual commandment" and an example of objective morality and ethics.[115]

**h. Lobster Fishing**

73. Mr. Strahan has held a commercial lobsterpot fishing permit in the state of New Hampshire since 2018, has held a recreational license for lobster fishing in Massachusetts since the early 1990s, and currently has a research permit for lobster fishing in Massachusetts.[116] He has applied for but been denied a commercial license in Massachusetts.[117]

**B. North Atlantic rights whales are in Massachusetts waters year-round.**

74. The range of the North Atlantic right whale, *Eubalaena glacialis*, extends from the coastal waters of southeastern United States to New England (including all Massachusetts coastal waters) and the Canadian Bay of Fundy, Scotian Shelf, and Gulf of St. Lawrence.[118] Nonetheless, there have been sightings as far off as Iceland, northern Norway, and the Azores.[119]

---

[114] *Id.* at 121:6–17, 122:7–15.

[115] *Id.* at 115:17–116:5.

[116] *Id.* at 117:8–118:2, 118:10–119:3, 129:24–130:7; Ex 233.

[117] *Id.* at 118:14–22.

[118] Day 1 Trial Tr. 21:16–23, 53:17-21.

[119] Ex. 104 at 17; *see also* Ex. 671 at 81; Ex. 1030 at 4-86. Right whales generally stay within 90 km of the shoreline. Ex. 104 at 17.

75. North Atlantic right whales can swim up to 75 miles per day, are highly mobile, and move within and between habitats extensively.[120] It is not uncommon for solitary right whales to be observed anywhere within the range of the species at any time of year.[121] So when individuals are sighted twice in the same location, even as little as two weeks apart, it should not be assumed they have been stationary for that period.[122]

76. New England waters, including Massachusetts waters, are important feeding grounds for right whales because these waters contain dense patches of the whales' food, zooplankton.[123] In response to climate-change induced shifts in the abundance and distribution of zooplankton,[124] the North Atlantic right whale's habitat shifted significantly, beginning in 2010. This shift included an increased presence of right whales in Cape Cod and Massachusetts Bay and late winter use of a region south of Martha's Vineyard and Nantucket.[125] These habitat-use patterns have exposed the population to additional anthropogenic threats, contributing to the recent population decline.[126]

77. Cape Cod Bay is an increasingly important habitat, hosting large aggregations of

---

[120] Day 9 Trial Tr. at 136:19–23; Ex. 104 at 17–18; Day 1 Trial Tr. 41:23-42:3. For example, in 2000, one whale 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.

[121] Day 1 Trial Tr. 41:22–42:8; Day 2 Trial Tr. 49:25–50:15; Ex. 104 at 17–18.

[122] Ex. 104 at 18.

[123] *Id.*

[124] Day 2 Trial Tr. 29:12–30:11; Ex. 671 at 215; Ex. 528 at slide 9; Ex. 1092 at CW035308–10.

[125] Ex. 104 at 18; Day 1 Trial Tr. 114:2–22; Ex. 671 at 210; Ex. 594B at 1, 3–4, 6.

[126] Ex. 104 at 20; *see also* Day 2 Trial Tr. 29:12–30:11; Ex. 528 slide 9; Ex. 671 at 82, 210.

right whales each spring.[127] In 2017, approximately 55% of the North Atlantic right whale population was observed in Cape Cod Bay, including over 200 individuals in a single day.[128] In 2019, 287 individual North Atlantic right whales—roughly 67% of the known population—were documented in Cape Cod Bay and adjacent waters.[129] Because aerial and vessel surveillance can only capture right whales at the surface of the water and individuals move in and out of the bay frequently, these are likely underestimates of the right whale presence.[130]

78. In the late fall months, pregnant female right whales generally migrate south to their calving grounds off Georgia and Florida,[131] while the majority of the population likely remains in the feeding grounds or disperses along the eastern seaboard.[132] Acoustic monitoring data has demonstrated nearly continuous, year-round presence of right whales across their entire range, suggesting that not all the population undergoes a consistent annual migration.[133]

79. North Atlantic right whales are regularly sighted in and around Massachusetts waters outside the seasonal aggregation period.[134] While these sightings vary by year, maps of

---

[127] Day 1 Trial Tr. 51:21-–52:5; Ex. 1087 at 4 (2014 DMF report noting "the steady increase in the portion of the North Atlantic population yearly visiting the bay").

[128] Day 1 Trial Tr. 51:21–52:5.

[129] Day 6 Trial Tr. 51:1–15; Ex. 544 at slide 6; Day 9 Trial Tr. 179:15–19.

[130] Day 6 Trial Tr. 51:16–52:1; Ex. 544 at slide 6; Ex. 1092 at CW035306.

[131] While calving generally occurs off the southeast coast, there is at least one recent report of a calf being born in the Gulf of Maine, and a newborn was detected in Cape Cod Bay in 2013. Ex. 104 at 18; Ex. 671 at 186–87.

[132] Ex. 671 at 187.

[133] *Id.*

[134] *See, e.g.*, Day 1 Trial Tr. 92:1–98:9, 108:18–109:20; Ex. 1087 at CW035234–35 (noting confirmed reports of right whales in Cape Cod Bay in December, "suggest[ing] an expansion of the seasonality of habitat use over recent years" that "may continue in the future"); Ex. 1088 at 4–5 (listing opportunistic sightings of two right whales on May 15 and three on May 17 near the Cape

reported North Atlantic right whale sightings show that right whales may be present in Massachusetts waters in any month.[135] Right whales have also been detected by acoustic monitoring in Massachusetts waters in all months of the year.[136]

**C. The North Atlantic right whale is critically endangered.**

80. The North Atlantic right whale was first listed as endangered under the ESA in 1970 and has remained endangered since.[137]

81. Each year, NMFS prepares a preliminary estimate of the North Atlantic right whale population for the annual meeting of the North Atlantic Right Whale Consortium (NARWC).[138] In October 2020, NMFS provided the NARWC with a preliminary estimate of 366 individuals as of January 2019.[139] The Commonwealth does not dispute this estimate.[140]

---

Cod Canal; two on June 25 near Wood End, Provincetown; one on June 30 northeast of Race Point, Provincetown; calf/cow pairs off Plymouth on July 23, near Herring Cove, Provincetown on July 27, and outside Boston Harbor on July 31; three on August 1 outside Boston Harbor; one on August 27 near Monomoy Island east of Chatham; a calf on August 28 outside Boston Harbor, on August 29 off Plymouth, on August 30 off Sandy Neck, Barnstable, off Plymouth on September 2, and near the Cape Cod Canal on September 5); Ex. 214 at 2 (describing "[r]eports of opportunistic right whale sightings in Cape Cod Bay and adjacent waters occurred nearly *every month* since the end of the 2016 season" (emphasis added)); Ex. 3011; Ex. 3013.

[135] For instance, there were no sightings of right whales in Massachusetts waters in July of 2016 and 2020, but numerous sightings of whales in Massachusetts waters in July of 2017, 2018, and 2019. Ex. 3011 slides 8, 21, 34, 47, and 59; *see also* Day 2 Trial Tr. 26:12–28:16; Ex. 1134 slides 2–13; Ex. 3013. *But see* Ex. 3011 slide 1 (noting that during 2020, survey effort was affected by the Covid-19 pandemic and, unlike previous years, 2020 does not include sightings by NMFS).

[136] Day 4 Trial Tr. 128:20-129:1.

[137] 35 Fed. Reg. 8,491, 8,495 (June 2, 1970); Day 1 Trial Tr. 41:14–21; Ex. 671 at 83.

[138] Ex. 671 at 82; Day 1 Trial Tr. 79:25–80:14.

[139] Ex. 1030 at 1-2; Day 1 Trial Tr. 79:23–80:15; *cf.* Ex. 671 at 82 (reporting this estimate as 368 individuals). NMFS also informed the NARWC that, based on updated data, it was preliminarily revising its original January 2018 estimate "down from 412 to 383 right whales for that year." Day 1 Trial Tr. 79:23–80:15.

[140] Day 1 Trial Tr. 85:8–12; Day 6 Trial Tr. 34:4–9.

82. It is also undisputed that the North Atlantic right whale population has been in serious decline for the last decade.[141]

83. NMFS, as part of its duties under the Marine Mammal Protection Act, quantifies the PBR, i.e., the maximum number of individuals that may be removed—meaning killed or seriously injured—from a marine mammal stock due to anthropogenic causes without impeding the stock's ability to recover.[142] The PBR is calculated by multiplying the minimum population size estimate by (a) one-half the maximum net productivity rate of the stock and (b) a recovery factor relative to the stock's optimum sustainable population (OSP).[143] The PBR for the species has never been greater than 1.0.[144]

84. NMFS's 2019 stock assessment[145] calculated a PBR of 0.8 for the North Atlantic right whale, based on a minimum population size estimate of 418, a maximum net productivity rate of 0.04, and a recovery factor of 0.1 ($418 \times (0.04 \div 2) \times 0.1 = 0.8$).[146] Based on NMFS's October 2020 preliminary population estimates, the PBR in the forthcoming stock assessment will

---

[141] *Id.* at 50:4–6, 59:3–17, 60:5–7; Day 6 Trial Tr. 50:15–20; Ex. 544 slide 3; Ex.1010 at CW087938; Day 1 Trial Tr. 50:4-6 (Commonwealth admitting that "the population of the North Atlantic right whale has been in decline for a decade"); Ex. 671 at 82 ("[S]ince 2011, when the abundance peaked at 481 animals, the population has been in decline . . . .").

[142] 16 U.S.C. § 1362(20).

[143] *Id.*; Ex. 104 at 22; *see* Day 1 Trial Tr. 17:8–13; Day 2 Trial Tr. 56:15–24; Ex. 1030 at 1-3.

[144] Ex. 1030 at 2-28.

[145] Stock assessments are required by § 117 of the MMPA, which provides that NMFS, in consultation with a regional scientific review group, must prepare an annual draft stock assessment for each marine mammal stock that occurs in U.S. waters. 16 U.S.C. § 1386(a); *see also* Day 1 Trial Tr. 82:3–7. Stock assessments are peer-reviewed and based on the best scientific information available. 16 U.S.C. § 1386(a); Day 1 Trial Tr. 82:8–10.

[146] Ex. 104 at 22 (2019 stock assessment reporting PBR of 0.8); *cf.* Ex. 1030 at 2-40 (stating that 2019 stock assessment "identified PBR as 0.9"); Day 1 Trial Tr. 19:3–10 (Glenn identifying current PBR as 0.9).

be even lower.[147]

85. It is undisputed that right whale mortalities and serious injuries caused by the Northeast/Mid-Atlantic American Trap/Pot Fishery have exceeded PBR for all but one of the last 25 years.[148]

86. The fact that human-caused serious injuries and deaths to right whales has exceeded PBR for decades means that entanglements (and in earlier decades, vessel strikes) have prevented the recovery of the species.[149]

87. Given the (i) severe rate of decline,[150] (ii) increasing frequency and severity of entanglements,[151] (iii) decreasing calving rate,[152] and (iv) diminishing health of the population,[153] the North Atlantic right whale is on the brink of extinction. Human-related activities cannot kill or seriously injure a North Atlantic right whale without threatening the species' survival.[154]

---

[147] *See supra* ¶ 81 & n.139.

[148] Day 1 Trial Tr. 20:21–21:5.

[149] *See, e.g.*, Ex. 594B at 1 ("At the current rate of decline, all recovery achieved in the population over the past three decades will be lost by 2029.").

[150] *See* Ex. 104 at 22-23; Ex. 594B at 2.

[151] *See infra* ¶¶ 116 (increasing frequency of entanglements), 121 (increasing severity of entanglements).

[152] *See infra* Section III.F.6.b(1).

[153] *See infra* ¶ 239.

[154] *See, e.g.*, Ex. 578 ¶ 10 (every further entanglement of a North Atlantic right whale is an unacceptable threat to the continued survival of the species); Ex. 1030 at 2-35 ("North Atlantic right whales have continued to experience unsustainable levels of mortality from entanglement.").

**D. DMF requires the use of vertical buoy lines to trap/pot fish in Massachusetts jurisdictional waters.**

88. The Division of Marine Fisheries[155] is vested with broad authority to "administer all the laws relating to marine fisheries" and regulate landing in and fishing in Massachusetts coastal waters.[156] This includes authority over how, when, and where fish may be taken; the legal size limits of fish that may be taken; how many fish may be taken; and the opening and closing coastal waters to the taking of fish.[157]

89. DMF also has authority to permit commercial and recreational fishing in the marine waters of the Commonwealth: No one may fish or take lobsters in Massachusetts waters or land in Massachusetts with lobsters taken from federal waters, either commercially or recreationally, without a permit issued by the DMF director.[158] It also issues offshore lobster

---

[155] DMF is a division of the Department of Fisheries, Wildlife and Environmental Law Enforcement within the Executive Office of Environmental Affairs (EEA). *See* Mass. Gen. Laws ch. 21A, §§ 2, 7, 8. The Department of Fisheries, Wildlife and Environmental Law Enforcement also contains the Division of Law Enforcement and the Division of Fisheries and Wildlife (DFW). *See* Mass. Gen. Laws ch. 21, §§ 6, 7. The Division of Law Enforcement has authority to enforce the statutes and regulations governing marine fisheries, and the Division of Fisheries and Wildlife has authority over all endangered species of Massachusetts, including marine mammals. *See Strahan v. Coxe*, 939 F. Supp. 963, 974 (D. Mass. 1996), *aff'd in part and vacated in part,* 127 F.3d 155 (1st Cir. 1997).

[156] Mass. Gen. Laws ch. 130, § 1A; *see also id.* § 17(10) (director of DMF is responsible for adopting, amending, or repealing "all rules and regulations . . . necessary for the maintenance, preservation and protection of all marine fisheries resources . . . .").

[157] Mass. Gen. Laws ch. 130, § 17A.

[158] *See* Mass. Gen. Laws ch. 130, § 80 (with exceptions for holders of other permits, "no person shall fish for or take fish for commercial purposes in the coastal waters . . . unless he is the holder of a commercial fisherman permit"); *id.* § 37 ("No person . . . shall at any time catch lobsters or edible crabs in, or take them from, the coastal waters or place, set, keep, maintain, supervise, lift, raise or draw in or from the said waters, or cause to be placed, set, kept, maintained, supervised, lifted, raised or drawn in or from the said waters, any pot, trap or other contrivance designed for, or adapted to, the taking of lobsters or edible crabs, unless licensed so to do under

permits authorizing landings in Massachusetts ports of lobsters fished in federal waters.[159]

90. The Commonwealth admits that DMF's licensing scheme requires lobster fishers use "vertical buoy rope on lobster pot gear deployed in Massachusetts coastal waters."[160]

91. While DMF's federal counterpart, NMFS, can regulate commercial fishing, DMF may impose additional or stricter regulations on commercial fishing in Massachusetts waters, and has exclusive power to regulate recreational fishing.[161]

92. The Commonwealth, through DMF, is of course required to follow federal mandates.[162] It may also enter into cooperative agreements with NMFS to conduct conservation programs in furtherance of ESA and MMPA goals and has done so for years.[163]

93. DMF, in conjunction with the Center for Coastal Studies (CCS) and with partial funding from a NMFS grant, manages the Large Whale and Sea Turtle Conservation Program to monitor and assess large whale species found in Massachusetts state and adjacent waters.[164] The program consists of: (1) aerial surveillance of right whales in Cape Cod Bay and adjoining waters; (2) right whale feeding habitat assessment and forecasting in the winter and spring seasons; and (3)

---

section thirty-eight."); *id.* § 38 ("A person shall not fish for or take lobsters or edible crabs in coastal waters . . . without a permit issued by the director [of DMF]."); Day 1 Trial Tr. 32:6–33:17 (describing types of lobster fishing permits issued by DMF).

[159] Mass. Gen. Laws ch. 130, § 38; Day 1 Trial Tr. 26:4–16, 32:14–20.

[160] Day 1 Trial Tr. 37:23–38:15; Ex. 3000 at 3; 322 Mass. Code Regs. § 4.13. Only scientific and research licensees are exempted from the requirement to use a surface identification system by VBR. Ex. 3000 at 3.

[161] Day 2 Trial Tr. 45:16–46:13.

[162] Day 1 Trial Tr. 16:22–25.

[163] *See* Day 2 Trial Tr. 59:10–19; Ex. 101; *see also* Day 2 Trial Tr. 59:25–60:5 (cooperative agreement does not absolve the Commonwealth of the requirement to comply with ESA mandates).

[164] Ex. 214 at CW035265.

entanglement response in Massachusetts waters year-round.[165] Administration of these programs costs approximately $860,000 annually.[166]

94. DMF conducts aerial surveillance of North Atlantic right whales primarily in Cape Cod Bay and adjoining waters from December through mid-May.[167] Sometimes these flights survey the waters of the outer cape and Massachusetts Bay, but routine aerial surveillance does not include Massachusetts waters south of Cape Cod or on the North Shore.[168]

95. From June through November, DMF relies on opportunistic sightings, i.e., reports of whale sighted by boaters and whale watchers.[169] DMF also has the option of obtaining sightings data from NMFS's acoustic surveillance of state waters and the NARWC's database of all confirmed right whale sightings throughout the range of the species.[170]

96. DMF's grant from NMFS requires the Commonwealth to prepare and submit an annual report of sightings data.[171] But because aerial and vessel surveillance can only capture right whales at the surface of the water and individual whales move in and out of the bay frequently, DMF's reports underestimate the right whale presence.[172]

---

[165] *Id.*

[166] Day 10 Trial Tr. 150:4–152:22.

[167] Ex. 1173; Day 1 Trial Tr. 42:25–43:16, 44:21–45:9. The NMFS grant funding this work also funds right whale feeding habitat assessment and forecasting during the winter and spring seasons and year-round entanglement readiness and response. Ex. 1088 at 2.

[168] *See* Day 1 Trial Tr. 44:21–45:17, 46:22–47:5; Day 10 Trial Tr. 86:15–88:11, 148:7–13; Ex. 1173.

[169] Day 1 Trial Tr. 42:25–44:20.

[170] Day 1 Trial Tr. 42:25–44:20, 47:6–19; Day 2 Trial Tr. 19:1–19.

[171] Day 1 Trial Tr. 47:20–48:5.

[172] Day 6 Trial Tr. 51:16–52:1; Ex. 544 slide 6. Comparisons of right whale acoustic monitoring and aerial surveillance data in Cape Cod Bay between 2001 and 2005 found that

**E. The American Lobster fishery overlaps the range of the North Atlantic right whale and includes its critical habitat.**

**1. The American Lobster Fishery overlaps the range of the North Atlantic right whale.**

97. Federal law establishes the Northeast/Mid-Atlantic American Lobster Trap/Pot Fishery (American Lobster Fishery).[173] It spans "the entire Northwest Atlantic Ocean and its adjacent inshore waters where lobsters are found, from Maine through North Carolina."[174]

98. The Atlantic Lobster Fishery is managed through federal and state cooperation: the states enact and enforce regulations for the state waters and the federal government does so for federal waters. The notion is that fishery resources do not abide by political boundaries, so fishery sustainability should be coordinated by both state and federal governments.[175]

99. For management purposes, the American Lobster Fishery management unit is divided into seven lobster conservation management areas (LCMAs).[176] Each of the LCMAs has its own specific regulations.[177] The LCMAs are shown below.[178]

---

aerial surveys detected rights whales on two-thirds of the days that acoustic monitoring did, suggesting that aerial surveillance may underestimate right whale presence by over 30%. Ex. 671 at 187.

[173] A "fishery" means "(A) one or more stocks of fish that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographical, scientific, technical, commercial, recreational, or economic characteristics; or (B) any fishing for such stocks." 16 U.S.C. § 5102(8).

[174] Ex. 2002 at ii.

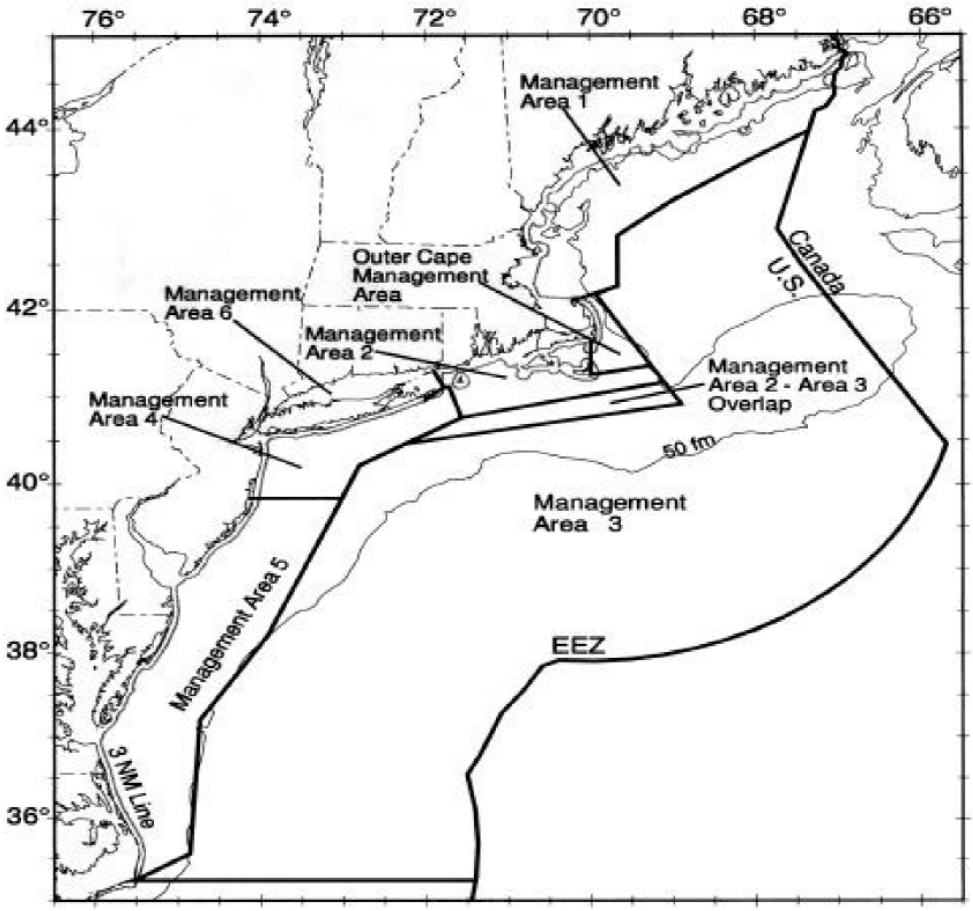
[175] *See* 16 U.S.C. § 5101 (findings and purpose of the Atlantic Coastal Fisheries Cooperative Management Act); Ex. 2002 at ii.

[176] *See* Day 1 Trial Tr. 24:11–28:6; Ex. 2002 at 17, 21–24.

[177] *See* Ex. 2002 at 21–24.

[178] Ex. 2002 fig. 1 & app. 1; *see also* Ex. 1050.

*American lobster Management Areas established for the purpose of regional lobster management.*




100. Of the approximate 3.5 million traps used in the American Lobster Fishery, about 3.3 million are deployed in Area 1,[179] which encompasses some of Massachusetts coastal waters (the coastal waters from the New Hampshire border through Cape Cod Bay). This represents approximately 90% of all lobster fishing in the American Lobster Fishery.[180] Massachusetts jurisdictional waters also overlap with LCMA 2 (the coastal waters of Nantucket Sound, Buzzards Bay, and Vineyard Sound, and the Nearshore Outer Cape Area).[181]

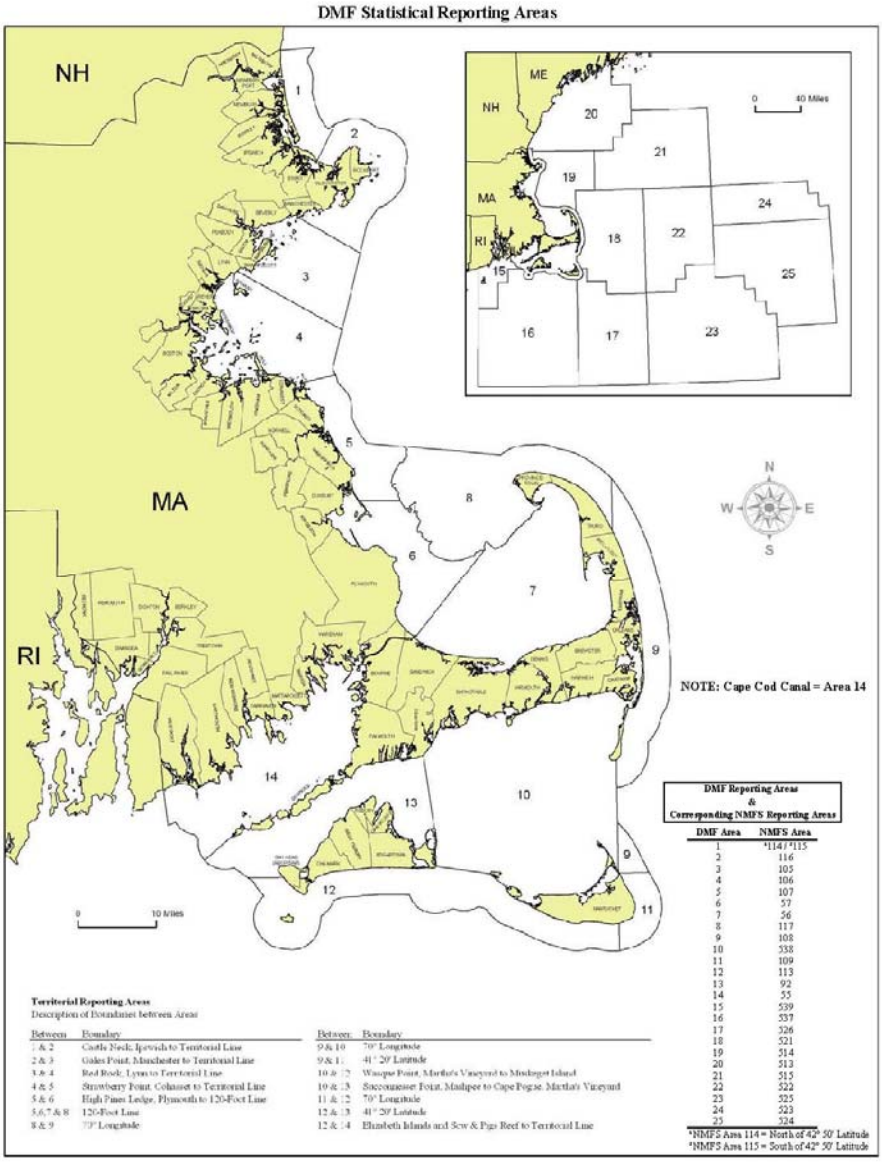
[179] Day 6 Trial Tr. 32:23–33:7.

[180] Day 10 Trial Tr. 143:12–23.

[181] Day 1 Trial Tr. 25:3–22.

101. Within those LCMAs, the Commonwealth's marine fishery jurisdiction extends from the shoreline of Massachusetts (in the case of bays, a straight line from shore to shore), extending three nautical miles out to sea. It includes all the waters of the Nantucket Sound.[182]

102. Massachusetts waters are divided into 14 statistical reporting areas (SRAs):[183]




[182] *See* Mass. Gen. Laws ch. 130, § 1; 322 Mass. Code Regs. § 8.02; Day 10 Trial Tr. 73:23–75:7.

[183] Day 2 Trial Tr. 13:15–22; Ex. 1051.

103. Based on the LCMA data, the commercial fishers licensed by the Commonwealth must submit reports on the SRAs they fish and the number of vertical buoy lines and lobster pots deployed in each.[184] (Recreational permit holders are not required to make these reports, but the agency estimates that its 10,000 recreational licensees deploy approximately 17,500 buoy lines in Massachusetts waters every year.[185]) DMF regularly prepares reports on the numbers of commercial vertical buoy lines deployed in each SRA.[186]

104. The extent to which vertical buoy lines are used for trap/pot fishing in Massachusetts jurisdictional waters by commercial fishers may be estimated from data using either the LCMA data or the SRA data.

105. The total maximum buoy lines in LMCA Areas 1, 2, and 3 and the Outer Cape was 102,492 in 2011 and 82,139 in 2018.[187] If one excludes LMCA 3 (federal waters only), the number is only reduced slightly, to about 80,000 lines per year (for the most recent data).[188]

106. DMF regularly prepares reports on the numbers of commercial vertical buoy lines deployed in each SRA.[189] Based on the SRA data, in the peak months the number of commercial lines exceeds 60,000 per year.[190]

107. Recreational permit holders are not required to make these reports, but the agency

---

[184] 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).

[185] Day 11 Trial Tr. 28:2–17.

[186] Day 2 Trial Tr. 13:15–14:2; Ex. 514; Ex. 513; Ex. 530; Ex. 670.

[187] Day 1 Trial Tr. 29:3–32:5, 33:14–23.

[188] Ex. 546. Note also the relatively small number of federal permits.

[189] Day 2 Trial Tr. 13:15–14:2; Ex. 514; Ex. 513; Ex. 530; Ex. 670.

[190] Ex. 670.

estimates that its 10,000 recreational licensees deploy about 17,500 (elsewhere estimated at about 20,000 buoy lines) in Massachusetts waters every year.[191]

108. The total number of lines used annually in Massachusetts jurisdictional waters (commercial and recreational) is in the range of about 80,000 to somewhat under 100,000 lines per year.

109. There was some testimony at trial about some seasonal behavior of lobsters which, understandably, may modify the fishing locations. Nevertheless, vertical buoy lines were reported to be present year-round in all Massachusetts waters except (1) in the Massachusetts Bay Restricted Area (during the restriction period) and (2) statistical area 11 (a small area off on the southeast of Nantucket).[192]

**2. Most Massachusetts waters overlap with federally designated critical habitat of the North Atlantic Right Whale.**

110. In 1994, NMFS designated critical habitat for the right whale in portions of Cape Cod Bay, Stellwagen Bank, and the Great South Channel (each off the coast of Massachusetts), along with waters adjacent to the coasts of Georgia and the east coast of Florida. These areas were determined to provide critical feeding, nursery, and calving habitats for the North Atlantic population of right whales.[193] The 1994 designation indicated that "[r]ight whales are the most

---

[191] Day 11 Trial Tr. 28:2–17; *see also* Day 2 Trial Tr. 49:4–19 (estimating 20,000 lines).

[192] *See* Ex. 514; Ex. 513; Ex. 530; Ex. 670.

[193] *See* 59 Fed. Reg. 28,793, 28,793–95 (June 3, 1994). The ESA specifies that the appropriate Secretary, "to the maximum extent prudent and determinable . . . shall, concurrently with making a determination . . . that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat . . . ." 16 U.S.C. § 1533(a)(3). Designation of a critical habitat "provides notice to Federal agencies and the public that a listed species is dependent on these areas and its features for its continued existence . . . ." *Id.* at 28,793. Designation of a critical habitat relates to the consultation duties of federal agencies under § 7 of

endangered of the large whales, despite the fact that they have been protected from commercial whaling since 1935."[194]

111. In 2016, NMFS revised the designation to expand the area and apply it to two areas of special importance to conservations of the North Atlantic right whale.[195] One "specific area" that contains the physical and biological features of foraging habitat that are essential to the conservation of North Atlantic right whales is within the Gulf of Maine and Georges Bank region, including "the large embayments of Cape Cod Bay and Massachusetts Bay and deep underwater basins. The area incorporates state waters from Maine through Massachusetts as well as federal waters, but does not include inshore areas, bays, harbors, and inlets."[196]

112. The area appears as below:

---

the ESA. *See* 16 U.S.C. § 1536(a)(4). Usually, it has no direct effect on private entities or state agencies.

[194] *See* 59 Fed. Reg. 28,793, 28,793 (June 3, 1994); *see also* 58 Fed. Reg. 29,186, 29,187 (May 19, 1993) (stating, in notice of proposed rule, that "critical habitat designation contributes to species conservation primarily by identifying critically import[ant] areas and by describing the features within the areas that are essential to the species, thus alerting public and private entities to the importance of the area").

[195] 81 Fed. Reg. 4,838, 4,838 (Feb. 26, 2016).

[196] 80 Fed. Reg. 9,314, 9,314 (Apr. 21, 2015); *see* 50 C.F.R. § 226.203; *see also* Day 1 Trial Tr. 22:2–23:9.

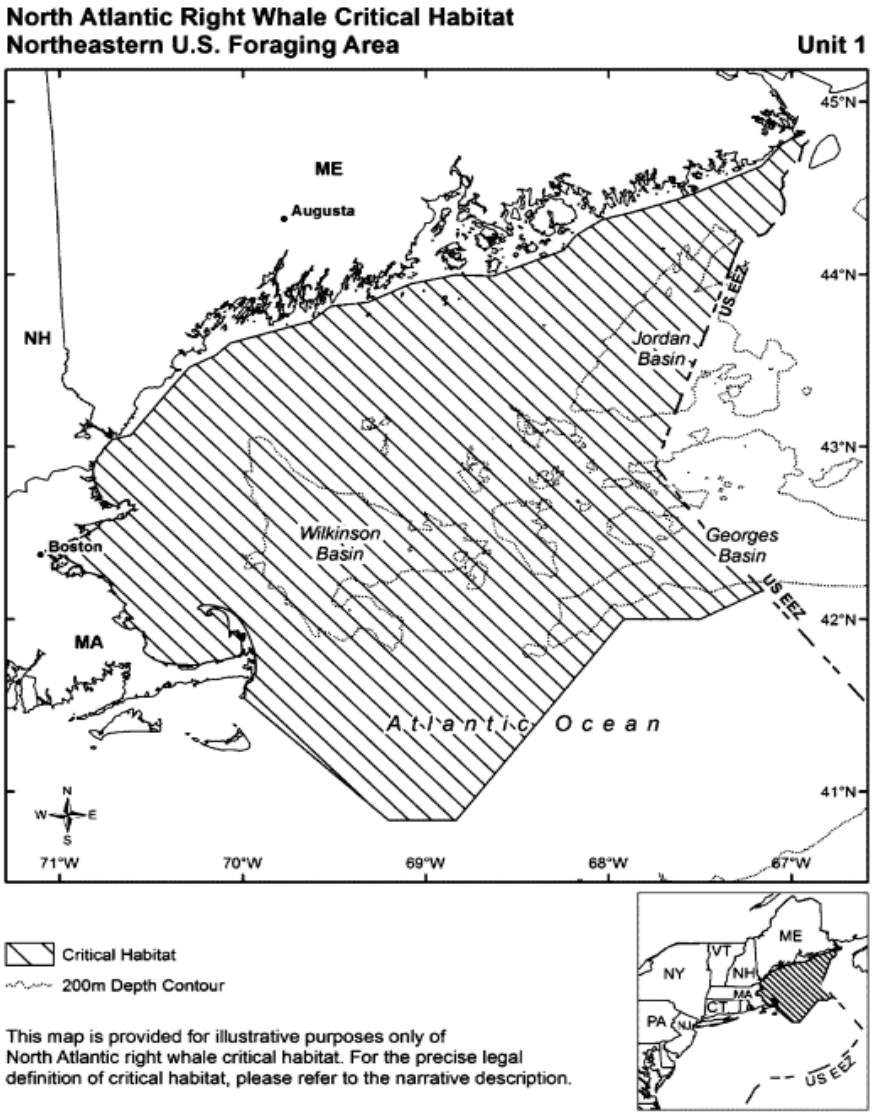



**Figure 1**. The specific area on which the essential features of North Atlantic right whale foraging habitat are found.

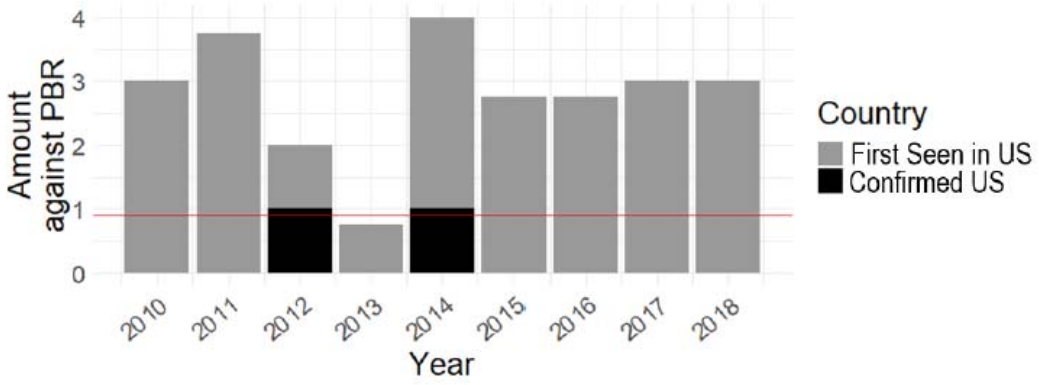
113. In addition to the critical habitat designation for the North Atlantic right whale, federal regulations also impose special approach and speed limits in this area intended to protect against vessel strikes.[197]

[197] *See, e.g.*, 50 C.F.R. §§ 224.103(c), 224.105(a)(3).

## F. North Atlantic right whales are entangled, injured and killed by vertical buoy lines used for trap/pot fishing in the American Lobster fishery, including Massachusetts.

### 1. Entanglements are the leading cause of serious injury and mortality to North Atlantic right whales.

114. Since 1970, all confirmed adult North Atlantic right whale mortality and serious injury has been from anthropogenic causes,[198] and entanglement in fishing gear has emerged as the dominant threat.[199] Between 2010 and 2018, right whale mortalities and serious injuries (SI/M) from entanglement in U.S. fishing gear averaged 7.7 per year and exceeded the allowable PBR for the species for all but one of those years.[200]




115. While vessel strikes are an important cause of right whale SI/M, their impact pales in comparison to that of entanglements. Entanglements caused 63% of all right whale SI/M between 2010 and 2018, while vessel strikes caused 15%.[201] Studies have shown that federal and state speed limits on vessels traveling through the North Atlantic right whale's habitat enacted in

[198] Ex. 594B at 7.

[199] *Id.*; Ex. 1030 at 2-29–2-32; Ex. 671 at 83–85; Ex. 104 at 22, 25.

[200] Ex. 671 at 160; Ex. 1030 at 2-37–2-38 & fig. 2.7.

[201] Ex. 1030 at 2-29–2-30 & tbl. 2.1; Day 1 Trial Tr. 125:17–127:17.

2008 have been generally effective in decreasing both the incidence and lethality of vessel strikes.[202]

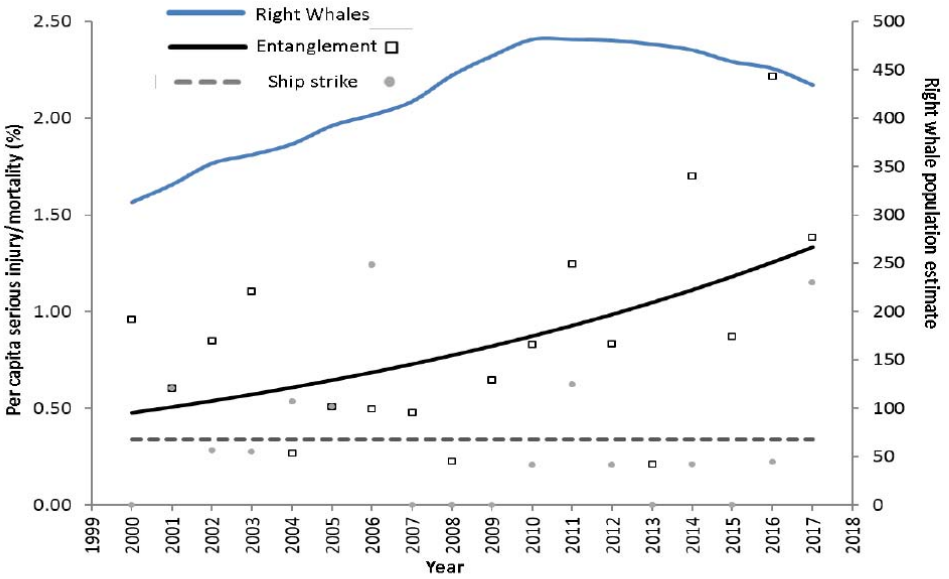



**Figure 4. North Atlantic right whale serious injury/mortality rates from known sources 2000-2017. The right whale population trend is overlaid and referenced to right y-axis**

116. As the incidence of SI/M from vessel strikes has decreased, SI/M caused by entanglements has steadily increased over the past 20 years.[203] The odds of an entanglement event are now increasing by an estimated 6.3% per year.[204]

117. The impacts of entanglements have devastated the North Atlantic right whale population. One projection found that, even if all other known or suspected effects on the species (e.g., vessel strikes, calving declines, climate change, sublethal entanglement effects, disease, predation) remained the same between 1990 and 2016, the 2016 population would have been as

[202] 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.

[203] Ex. 594B at 7; Ex. 104 at 24; Day 6 Trial Tr. 131:1–4; Day 7 Trial Tr. 38:22–39:1; Ex. 582 figs. 1, 6; Day 4 Trial Tr. 14:5–9. 38:4–9 (Dr. Sharp testifying that, from 2003 to 2018, entanglement-related death as a percentage of all known North Atlantic right whale deaths increased from 21% to 51%); Ex. 578 ¶¶ 6, 10; Day 6 Trial Tr. 118:14–119:4, 127:6–15 (based on entanglement data from New England Aquarium's photo ID database).

[204] Ex. 104 at 22.

much as 24.6% higher were it not for SI/M from entanglements.[205]

**2. North Atlantic right whales suffer significant cryptic, i.e., unseen, serious injuries and deaths from entanglements.**

118. Because SI/M reports are limited to *confirmed* human-caused SI/M, the numbers in these reports must be considered a definitive lower bound.[206] Detections of mortalities and serious injuries are irregular, incomplete, and under-representative, and studies consistently find that actual and estimated SI/M significantly exceed detected SI/M.[207]

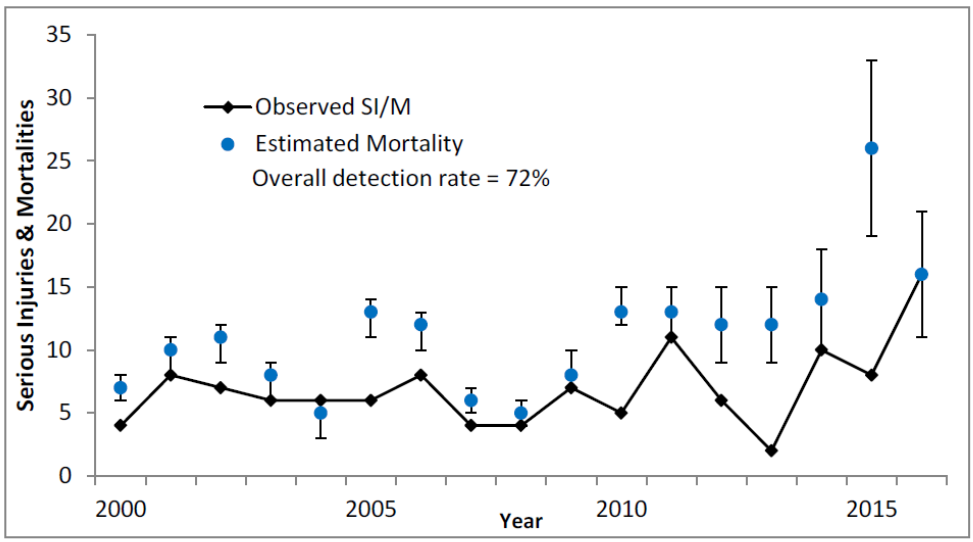



**Figure 5. Time series of observed annual total serious injuries and mortalities (SI/M; black line) versus estimated total mortalities (blue points with associated error bars).**

119. This is particularly true of entanglement-caused mortalities in right whales. A recent study found that observed carcasses account for only 36% of right whale deaths.[208] While entanglement is the documented cause of 87% of serious injuries in right whales, it is determined

[205] Ex. 671 at 85.

[206] Ex. 104 at 23.

[207] *Id.* at 23-24 & fig. 5; Ex. 109 at 4.

[208] Day 4 Trial Tr. 110:4–111:5.

to be the cause of death in about 50% of right whale necropsies.[209] The study therefore concluded that when entanglement-related injuries kill right whales, such deaths are far more likely to be "cryptic," or unobserved, indicating that observed mortalities significantly underrepresent entanglement-caused mortality.[210]

120. The SI/M data also do not reflect cases where entanglements weaken individuals or make them otherwise vulnerable to further injury.[211]

121. Because of these limitations, scarring is a better indicator of the frequency and severity of right whale entanglements than SI/M reports.[212] A review of scars detected on 626 individual North Atlantic right whales over a 30-year period documented 1,032 definite, unique entanglement events.[213] Of the 626 whales observed, 83% were entangled at least once and 59% entangled more than once.[214] 26% of the observed scars were less than a year old.[215] Juveniles and calves were entangled more frequently than adults.[216] Scarring analyses also suggest that entanglement wounds have become more severe since 1990 and that efforts made since 1997 to reduce right whale entanglements have been ineffective.[217]

---

[209] Day 4 Trial Tr. 113:22–114:4.

[210] *Id.* at 112:9–114:4.

[211] Ex. 104 at 23–24.

[212] *Id.* at 25; Day 1 Trial Tr. 129:10–130:3.

[213] Ex. 104 at 25 ; Ex. 671 at 211–12.

[214] Ex. 104 at 25; Ex. 594B at 9.

[215] Ex. 104 at 25; Ex. 594B at 9.

[216] Ex. 104 at 25.

[217] *Id.* at 25; Day 7 Trial Tr. 126:2–4; *see* Ex. 594B at 9.

**3. North Atlantic right whales are at risk of entanglement wherever they encounter vertical buoy lines.**

122. North Atlantic right whales may become entangled whenever they are in the presence of VBRs.[218] NMFS has stated:

> Being able to directly link an entanglement with specific gear deployed at specific place in time is rare, but by mapping known locations of gear that led to the entanglement of a right whale, one can see that there is no place within the fished area along the East Coast of North America for which entanglement risk is zero.[219]

123. The highest abundance of North Atlantic right whales in New England waters occurs from March through November, which is also the peak fishing period for New England fisheries.[220]

124. Fishing gear causes nearly all large whale entanglements,[221] and trap/pot gear specifically is the highest documented source of entanglement.[222] Any line in the water column, including line resting on or floating above the seafloor, has the potential to entangle a whale; these entanglements may involve the whale's head, front flippers, flukes, tail stock, or baleen.[223]

---

[218] Ex. 671 at 160; Ex. 1030 at 1-3; Day 1 Trial Tr. at 42:11-16; Ex. 578 ¶ 7 (wherever vertical buoy rope and right whales co-occur there is a threat of whales being entangled in that line); Ex. 594B at 10 ("Each vertical line out there has some potential to cause an entanglement."); Day 7 Trial Tr. 35:15-35:2, 134: 7-12.

[219] Ex. 594B at 10.

[220] Day 10 Trial Tr. 52:1-19 (Mr. Lorentzen explained that are most productive time for lobster fishing in Massachusetts waters occurs during the spring and early summer. By the late summer, fall, lobsters previously in Massachusetts waters move into the deeper, federal waters.); Day 10 Trial Tr. 57:21–58:14, 56:2-15 (Mr. McKiernan explaining the same); Ex. 671 at 209–10 (the same trend holds true for sei whale and for fin whales, another endangered species).

[221] Ex. 1030 at 2-32 (reporting that between 2010 and 2018, only 3 of 440 documented entanglements involved non-fishing gear).

[222] *Id.*

[223] Ex. 671 at 160, 209.

125. Fixed fishing gear, such as traps/pots, are set on the ocean floor and then fished continuously.[224] Lobster traps are usually fished in a configuration known as a "trawl," in which a ground line connects multiple traps on the ocean floor.[225] Lobster fishers then connect "endlines"—VBRs that run from the ocean floor to the ocean's surface—to either end of the trawl.[226] A buoy connected to the top of the endline marks the location of the gear.[227] The length of endlines may exceed the depth of the water fished.[228]

126. When a whale comes in contact with a VBR, the whale will try to evade the line, often by twisting and turning laterally to escape.[229] This twisting and turning motion only worsens the entanglement, wrapping the line around whatever body parts the rope contacts.[230]

127. North Atlantic right whales appear to have a "very strong reflex" to touch.[231] That reflex includes an "evasion" response, which, when the stimulus is a fishing line, results in "wrapping of the rope around appendages."[232]

---

[224] Ex. 1030 at 1-3.

[225] Ex. 671 at 15. A 20-trap trawl is typical in Massachusetts waters. Day 10 Trial Tr. 34:5–8; 41:20–21; 43:23–25.

[226] *See* Day 8 Trial Tr. 26:20–24, 27:14–19; Ex. 671 at 15.

[227] Day 8 Trial Tr. 25:22–25.

[228] *See, e.g.*, Day 10 Trial Tr. 33:8–34:4 (lobster fisher Ryan Drohan explaining, "if you're in 300 feet of water, you need at least 400 feet of rope to keep up with the wind and the currents").

[229] Ex. 671 at 209; Day 9 Trial Tr. 42:25–45:15.

[230] *See* Ex. 578 ¶ 16 ("Even if the whale does break free of the anchored gear, it is left with multiple wraps of a chronic, life-threatening entanglement in the remaining line."); Day 4 Trial Tr. 47:12–48:7; Day 9 Trial Tr. 42:25–45:15.

[231] Day 9 Trial Tr. 46:17–48:6; *see also id.* at 46:17–48:6 (explaining that, during a study designed to record the thickness of whale blubber, the touch of a piece of equipment to the whale caused the whale to "react strongly" by "put[ting] its head up, and . . . sink[ing]").

[232] Day 9 Trial Tr. 48:8–49:16.

**4. Most entanglements of North Atlantic right whales cannot be attributed to a country of origin or a fishery.**

128. One of the significant challenges for right whale conservation has been the inability to identify the precise location of initial entanglement.

129. Figures may vary depending on approach, but by one reliable estimate 76% of North Atlantic right whale entanglement events cannot be assigned to a fishery or country of origin.[233] Whales may carry gear for long periods of time and over great distances before being detected.[234] Entangling gear is retrieved only 21% of the time.[235] And even in cases where gear is retrieved, the identifying portion of the gear (such as the permit number on the buoy, trap, or net) is often lost because the whale breaks the gear during the entanglement,[236] or the gear simply may not be adequately marked.[237]

130. The Commonwealth's own expert, Amy Knowlton, testified that of the just over 1,600 right whale entanglement cases documented by the New England Aquarium, the location where the entanglement occurred had been determined for only 1%.[238]

131. Coupled with the challenge that the vast majority—indeed, almost all—entanglements cannot be attributed to having first occurred in a particular location within the

[233] Ex. 1030 at 2-32 (no gear retrieved and/or the fishery of origin or type of fishing gear are not identifiable for a large portion of entanglements, including 76% for right whales); *see also* Ex. 109 at 3; Ex. 1030 at 2-30, 2-34, 2-40; Ex. 115 at 86879; Ex. 160 slide 19; Day 1 Trial Tr. 131:11–14; Day 6 Trial Tr. 41:16-24.

[234] Ex. 104 at 23–24.

[235] Ex. 1030 at 2-30.

[236] Day 2 Trial Tr. 52:16–53:4.

[237] Ex. 104 at 23–24.

[238] Day 7 Trial Tr. 35:4–7.

American Lobster fishery is the ubiquity of entanglements themselves. As discussed elsewhere, it is estimated that over 85% of the right whale population has suffered at least one entanglement causing scarring (and many have suffered multiple entanglements), and that about a quarter of the population suffers entanglements every year.

132. Based on this, Ms. Knowlton conceded that there was no safe place for right whales on the eastern seaboard while VBRs remained in use.[239]

**5. North Atlantic right whales are entangled in Massachusetts waters.**

133. The Commonwealth does not dispute that North Atlantic right whales may become entangled within their entire geographic range and recognizes that most entanglements cannot be attributed to a specific fishery.[240]

134. The Commonwealth has insufficient information to admit or deny that North Atlantic right whales continue to become entangled in Massachusetts-licensed fishing gear.[241]

135. As a result, conservation measures are directed to the range of the species, and all areas where trap/pot fishing occurs. In other words, all efforts directed toward addressing the VBR problem for right whales concede that entanglements occur wherever right whales may be found in water where VBRs are located, and this includes Massachusetts jurisdictional waters.

136. Despite the rarity of being able to pinpoint the location of initial entanglement—and the fact that doing so is an irrelevancy to the immediate problem of eliminating entanglements—there have been instances of entanglements traceable to Massachusetts-licensed

[239] Day 7 Trial Tr. 35:15–36:2.

[240] Day 1 Trial Tr. at 42:11-19; Day 2 Trial Tr. at 50:16-51:3, 52:16-53:4.

[241] Day 1 Trial Tr. 36:20–37:22; Ex. 3000 at 2.

gear. The sources of these specific examples are (i) documented Massachusetts entanglements, (ii) necropsy results, and (iii) other NMFS reports.

137. *Documented Massachusetts entanglements*. The Commonwealth admits that, since 2000, there have been two North Atlantic right whale entanglements in Massachusetts-licensed lobster fishing gear.[242] In September 2009, a right whale known as ZigZag was spotted in Provincetown Bay with line from lobster gear set in Cape Cod Bay caught in its mouth and tightly wrapped around its upper jaw.[243] In September 2016, a right whale known as Sundog was sighted north of Race Point, Provincetown, with lines from Massachusetts lobster gear wrapped around its rostrum and heavy gear and buoys trailing behind its flukes.[244]

138. *Necropsy information*. Necropsy information also suggests two other documented, likely cases of entanglement in Massachusetts waters. First, on October 23, 2017, a juvenile North Atlantic right whale was found stranded on Nashawena Island, in Massachusetts.[245] The carcass 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.[246] Based on this evidence, the

---

[242] *See* Day 1 Trial Tr. 36:20–37:15, 69:24–70:8; Ex. 3000 at 2.

[243] Ex. 1112 at row 119. NMFS classified this entanglement as a serious injury. *Id.*

[244] *Id.* at row 239. A successful disentanglement was able to avert serious injury to the whale. *Id.* This entanglement occurred outside the seasonal closure period enacted by DMF beginning in 2015. Day 1 Trial Tr. 69:24–70:8. While there are not dense aggregations of right whales in Massachusetts waters in September, September is a month with high fishing effort (and consequently, a high number of lines in the water). *See, e.g.,* Ex. 3011 slides 10, 23, 36, 49, 61; Ex. 1016.

[245] *See* Ex. 286 at WHOI-000352; Day 4 Trial Tr. 74:18–20.

[246] 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

whale's cause of death was determined to be peracute underwater entrapment.[247] This entrapment and death likely occurred in waters near Nashawena Island—all of which are Massachusetts state waters. As Dr. Sharp explained, because there was no pronounced water line or sunburn on the animal, it was unlikely that the whale had been floating, dead, for an extended period of time.[248] She therefore concluded that the whale was likely entangled in Massachusetts waters.[249]

139. Second, on August 25, 2018, the carcass of a 2.5-year-old North Atlantic right whale was spotted off the coast of Martha's Vineyard.[250] All prior sightings of the whale since 2017 had been south of Cape Cod, including four months earlier.[251] A necropsy determined the cause of death to be acute underwater entrapment from VBRs, which anchored the whale under the water's surface, eventually drowning him.[252] The evidence supporting this conclusion was a lack of any healing of the whale's entanglement injuries[253] and food in the whale's stomach, suggesting recent feeding.[254] There was no evidence of blunt force trauma or disease that would suggest a

---

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").

[247] *See* Ex. 286 at WHOI-000353; Day 4 Trial Tr. 74:21–24.

[248] Day 4 Trial Tr. 79:17–80:13.

[249] *Id.* at 79:17–80:13 ("[B]ased on all of . . . the evidence of an acute death, we do believe that it was likely this animal died somewhere near the locality where it was found.").

[250] Ex. 290 at WHOI-000526.

[251] *Id.* at WHOI-000528.

[252] *Id.*

[253] Day 4 Trial Tr. 25:21–26:8 ("[F]or this animal, there was no evidence of a chronic [healing] process associated with those entanglement lesions. So those lesions, themselves, were determined to be acute.").

[254] *Id.* at 23:17–24:17 ("[T]his animal had a pretty decent amount of stomach contents as well as feces that were supportive of a recent feeding behavior . . . something that you wouldn't

cause of death other than entanglement and drowning.[255] The necropsy explained that "young whales often cannot break free of heavy gear," which "supports the proximate and ultimate causes of death in this case."[256] This whale likely died in or near Massachusetts state waters in August 2018—"with an acute underwater entrapment, the presumption is the animal died somewhere local to where the carcass was found."[257]

140. *Other NOAA reports of possible Massachusetts entanglements.* NMFS's entanglement database contains dozens of reports of right whales first sighted with entanglement injuries in Massachusetts waters or entangled in gear with markings or characteristics typical of VBRs used in Massachusetts waters.[258] For example, in April 2011, a right whale known as Chiminea was spotted entangled in Cape Cod Bay with VBRs on both sides of its mouth and trailing down and around her body and over its flukes.[259] NMFS identified the 3/8" entangling line as Northern U.S. inshore lobster gear.[260] In April 2017, a right whale was sighted in Cape Cod Bay with 50 feet of VBRs trailing from its mouth to its flukes, after having been sighted gear-free just 11 days earlier.[261] In

---

necessarily see in a chronically debilitated animal."); Ex. 290 at WHOI-000528 ("The evidence of recent feeding . . . is supportive of death due to acute entanglement since most right whales are entangled while feeding and many chronically ill animals will not feed just prior to death.").

[255] Ex. 290 at WHOI-000527; Day 4 Trial Tr. 23:17–24:17.

[256] Ex. 290 at WHOI-000528.

[257] Day 4 Trial Tr. 28:13–29:3; *id.* at 29:5–18 ("[F]or an animal that is chronically entangled, we don't know where they necessarily originally became entangled. For an animal that is found to have died acutely from drowning in gear, as with this case . . . it is believed that that animal likely died in proximity to where it was found.").

[258] *See, e.g.*, Ex. 1112 at rows 148, 179, 224, 226, 243, 246, 254, 274, 276, 277, 292.

[259] *Id.* at row 148.

[260] *Id.*

[261] *Id.* at row 246.

2012, a right whale was found dead off Palm Coast, Florida, entangled in 3/8" line identified by NMFS as Northern U.S. inshore lobster gear.[262]

141. Based on (i) the significant presence of right whales in Massachusetts waters (along with its mobility and sightings throughout the year), (ii) the prevalence of entanglements in the population as a whole (more than 87% of all right whales, and about one quarter of the population being entangled annually, (ii) the inability to pinpoint initial entanglement, (iii) the acknowledgements by federal, state and NGO authorities that entanglements occur over the range of the species, and (d) documented and suggested episodes of entanglements within Massachusetts jurisdictional waters, this Court must conclude that North Atlantic right whales have been entangled and, if VBRs are not removed, will be entangled in Massachusetts jurisdictional waters.

142. The Commonwealth also admits that approximately six to eight endangered sea turtles annually are entangled in lobster pot gear in Massachusetts coastal waters licensed and regulated by DMF. The Commonwealth admits that sea turtles became entangled in Massachusetts-licensed lobster gear in 2019.[263]

**6. Entanglements harm North Atlantic right whales in a variety of ways.**

143. Entanglements harm North Atlantic right whales by killing them, seriously injuring them, or causing various sub-lethal harms, including diminishing their ability to reproduce and nurse and impeding their ability to swim and eat.[264]

144. When a right whale becomes entangled in fishing gear, it must expend energy

---

[262] *Id.* at row 179. ALWTRP markings indicated that the line was part of "Northern inshore/nearshore trap" gear.

[263] Day 1 Trial Tr. 38:16–39:3; Ex. 3000 at 3.

[264] *See, e.g.*, Day 9 Trial Tr. 50:11–51:14, 58:23–59:14.

dragging that gear, depleting the energy available for behaviors like foraging, migration, and reproduction.[265]

145. The energetic cost of entanglement varies depending on the amount of rope, whether there is a buoy or trap attached, the way the ropes have entangled the whale, and whether the whale can free itself.[266] In cases of severe entanglement, the cost is "comparable to the cost of producing a calf."[267]

**a. Entanglements can kill North Atlantic right whales by drowning or slow and painful wasting.**

146. VBRs can kill a North Atlantic right whale by anchoring the whale in gear so the whale is unable to reach to the water's surface to breathe (peracute underwater entrapment).[268]

147. VBRs can also chronically entangle a right whale in fishing gear, slowly and painfully depleting the whale's energy stores, impeding its ability to breath, reducing its ability to feed, hampering its ability to swim, or increasing its susceptibility to predation and disease until the whale finally succumbs to its entanglement injuries and dies.[269]

**b. Sublethal entanglements endanger the survival of the North Atlantic right whale species.**

148. The primary and most important sublethal harm to North Atlantic right whales from entanglements is a reduced ability to reproduce and nurse calves.[270]

---

[265] *Id.* at 50:11–51:14.

[266] *Id.* at 57:17–58:18.

[267] *Id.* at 55:11–56:23; *see also* Ex. 671 at 213.

[268] *See* Day 4 Trial Tr. 16:6–18:5, 21:6–17; Day 5 Trial Tr. 27:21–25.

[269] *See* Day 4 Trial Tr. 16:6–18:5, 38:13–39:11, 53:7–55:21, 55:22–60:23.

[270] *See id.* at 89:7–90:7; Day 9 Trial Tr. 50:11–51:14.

**(1) Entanglements reduce the number of calves born and prevent the North Atlantic right whale population from recovering.**

149. The North Atlantic right whale's calving rate is roughly half of what it has been historically[271] and has been an increasing concern in recent years, with only five births in 2017, no births in 2018, and seven births in the 2019/2020 calving season.[272]

150. The evidence suggests that entanglements have caused this reduction in calving by depleting their energy stores and impeding their ability to feed efficiently.[273]

151. This reduced ability to become pregnant has substantially increased the North Atlantic right whale's intercalving interval.[274] The expected intercalving interval for a right whale is three years;[275] the current intercalving interval for North Atlantic right whales is seven years.[276]

152. This decreased reproduction threatens the North Atlantic right whale's ability to

---

[271] Day 1 Trial Tr. 50:13–51:7; Ex. 1030 at 2-36 (reporting average of 12.8 calves per year over the last decade versus 22 per year between 2000 and 2010); *see also* Ex. 104 at 21 (referencing study finding that right whale calving rate from 1990 to 2016 was approximately a third of that found for the Southern right whale (*Eubalaena australis*), a closely related species).

[272] Ex. 1030 at 2-36.

[273] Ex. 104 at 21–22; Day 1 Trial Tr. 50:13–51:7; Day 4 Trial. Tr. 89:7–90:7 ("[C]hronic 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 (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 . . . ."); *id.* at 60:18–61:4; Day 7 Trial Tr. 127:24-25 (Ms. Knowlton agreeing that "sublethal entanglement drag reduce[s] North Atlantic right whale . . . fecundity."); Ex. 578 ¶ 5 ("Chronic stress can have sublethal but clinically significant effects on animals including immune suppression and can impact their ability to successfully reproduce.").

[274] Day 9 Trial Tr. 60:18–61:18.

[275] *Id.* at 63:1–9 ("[I]f you look at the intercalving interval that one would reasonably expect from a right whale species, then one should look at the southern right whale as the baseline. And their intercalving interval is three years. And way back, that was what the North Atlantic right whale tended to do as well, but that has increased substantially over the last 20 years.").

[276] *Id.* at 62:23–25.

recover.[277] In the last few years, the number of North Atlantic right whale births has been too small to replace the number of whales lost through anthropogenic deaths. For example, from 2017 to 2019, 30 right whale deaths were observed and only 12 births were recorded.[278]

**(2) Entanglements have reduced North Atlantic right whales' body size, which inhibits their ability to escape entanglements and survive food shortages.**

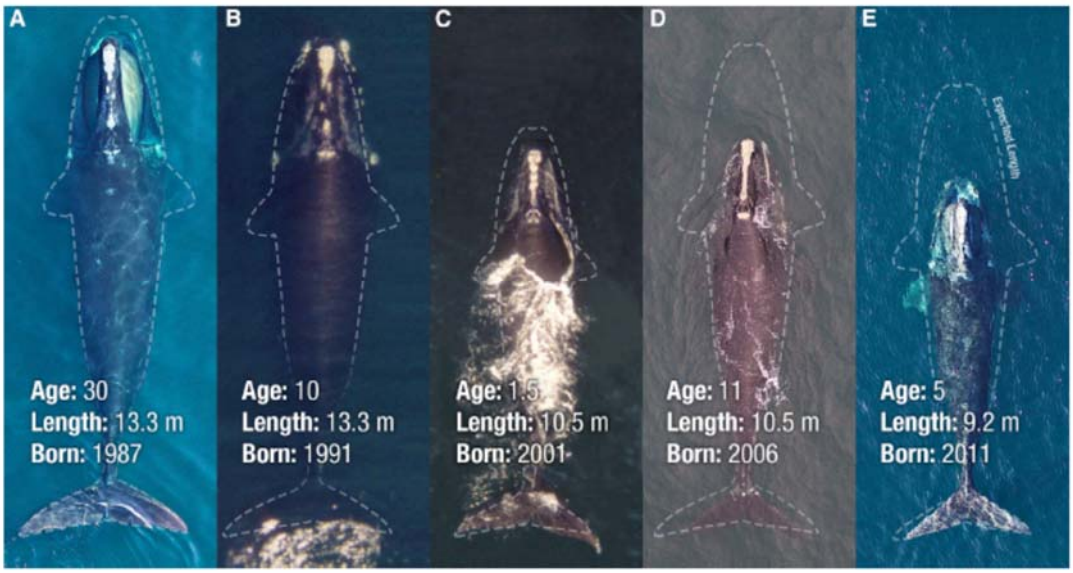
153. In June 2021, Dr. Moore and Ms. Knowlton published a peer-reviewed study finding that North Atlantic right whale body lengths are lower for entangled whales, whales born to entangled mothers and, most significantly, North Atlantic right whales born more recently.[279] North Atlantic right whales born in 2019 are expected to reach a maximum body length that is, on average, one meter shorter than a right whale born in 1981.[280]

[277] *Id.* at 63:10–23.

[278] Ex. 578 ¶ 9.

[279] *See* Ex. 3003 at 2 & fig. 1; Day 9 Trial Tr. 64:15–67:2, 70:71:14.

[280] Day 9 Trial Tr. 65:16–67:2, 70:7–71:14; Ex. 3003 fig. 1. On cross-examination, the defendants attempted to push Dr. Moore into agreeing that that this finding could result from longer entanglements in stronger rope in recent years. But Dr. Moore disagreed with this interpretation of the study's results. Day 9 Trial Tr. 213:14–23 ("Q. And if the longer entanglements are in recent years, that could track the correlation of the shorter length that's matched by birth year, right? A. Well, yeah, because – am I allowed to have a mechanistic thought about this or not? Q. Well, it wouldn't necessarily be a separate variable, would it? If the longer entanglements are all the later birth animals, then it would be built into the birth year data, right? A. No. I disagree. I disagree with that.").




154. Entanglements appear to be driving this reduction in body lengths.[281] For example, an entangled mother cannot provide the nutrition its calf needs to grow to full length.[282] As Dr. Moore explained, "the entanglement could be looked at as a second calf . . . ."[283]

155. As Dr. Moore explained, "the balance between energetic drain from entanglement obviously is in the context of other impacts on the energy balance of these animals such as food quality and food quantity that the animals are able to consume and other traumas that these animals may have such as sublethal vessel strikes and acoustic trauma and so on."[284]

156. This decrease in North American right whales' body length is significant. First, a one-meter reduction in length translates roughly to a 25% reduction in weight; less mass means

[281] *Id.* at 73:13–74:13 ("[T]he signal from the entanglement was very clear").

[282] *Id.* at 71:25–72:15.

[283] *Id.* at 71:25–72:15.

[284] *Id.* at 73:13–74:13.

less strength.[285] Second, a smaller and lighter whale is more susceptible to starvation in lean times.[286] These biological changes increase the whales' susceptibility to harm from entanglements: a weaker whale is less likely to break free from an entanglement and a leaner whale is more likely to starve and less likely to reproduce if an entanglement impedes its feeding ability.

**(3) Entanglements have negatively impacted North Atlantic right whales' general health.**

157. Chronic entanglements deteriorate the overall health of North Atlantic right whales by causing infections or impairing blood circulation and reducing the whales' ability to regulate their body temperature. Sublethal entanglements can also affect whales' ability to eat, especially if the entanglement affects the baleen.[287]

**c. Entanglements disproportionately affect female North Atlantic right whale and juveniles.**

158. The survival rate of female North Atlantic right whales who are over five years old is lower than males in the same age range.[288] Approximately 94 breeding females remain.[289] Given this low number, protection of the species is essential to avoid its extinction.[290] Studies have found

---

[285] *Id.* at 69:3–70:6 ("Length translates to volume, which is the cube of length, right? So the weight of these animals decreases. So the ultimate weight of a fully grown adult will be less. It makes them less strong. Their ability to break out of gear is reduced. And it also makes them more susceptible to lean times . . . .").

[286] *Id.* at 69:3–18.

[287] *Id.* at 78:7–79:4 ("[I]f you've got rope in the baleen, then that will reduce the efficiency of the filter bed that the baleen represents so that the food can escape through the side and not get swallowed."); *see also* Ex. 671 at 213.

[288] Ex. 671 at 83. (In 1990, there was an estimated 142 males and 123 females; by 2015, estimates show the species comprised 272 males and 186 females.).

[289] Day 1 Trial Tr. 81:7–82:1.

[290] Day 1 Trial Tr. 81:8–82:1.

that female mortality is primarily anthropogenic and has limited the recovery of the species.[291]

159. Age structure analyses of the North Atlantic right whale population suggest it contains a smaller proportion of juveniles than expected, which may reflect high juvenile mortality.[292]

**G. NMFS's past conservation efforts failed to abate, to required levels, serious injury and death to North Atlantic right whales.**

160. As noted, the MMPA amendments required NMFS to develop and implement the Atlantic Large Whale Take Reduction Plan (ALWTRP) to assist the recovery or prevent the depletion of all ESA-listed large whales that interact with commercial fisheries.[293]

161. As required by statute,[294] the purpose of the ALWTRP was to reduce entanglement-related SI/M to below PBR in within six months and to zero within five years of its implementation.[295]

162. NMFS tasked a group, called the Atlantic Large Whale Take Reduction Team (ALWTRT), to develop a plan. The ALWTRT consists of representatives from the fishing industry,

---

[291] Ex. 104 at 21; *see* Day 1 Trial Tr. 50:13–51:7; *see also* Ex. 671 at 83 (population could potentially increase at a rate of at least 4% per year if there was no anthropogenic mortality; adult female mortality is the main factor influencing calving rate).

[292] Ex. 104 at 22.

[293] Ex. 671 at 176; *see supra* Section II.B.5.

[294] 16 U.S.C. § 1387(f); *see also* 62 Fed. Reg. 39,157, 39,159 (July 22, 1997) (first goal to reduce SI/M of right whales in U.S. commercial fisheries to below PBR by January 1998; second goal to reduce by April 30, 2001 entanglement-related SI/M of right whales, humpback whales, fin whales, and minke whales to insignificant levels approaching a zero mortality and serious injury rate); Ex. 1030 at 1-5; Appendix §§ F, H.

[295] Ex. 671 at 176 ("The first regulations stemming from the Plan went into effect in 1997" and the "long-term goal, established by the 1994 Amendments to the MMPA, [was] to reduce entanglement related serious injuries and mortalities of right, humpback and fin whales to insignificant levels approaching zero within five years of Plan implementation.").

state and federal resource management agencies, the scientific community, and conservation organizations,[296] including the DMF Director.[297]

163. Regulations have focused primarily on fishing gear, including requiring weak links between lines and buoys/traps, eliminating floating line, requiring sinking groundline, as well as limited time-area closures in critical habit.[298]

164. Changes to the ALWTRP were last finalized and implemented in 2014 and 2015.[299] The major elements of the current ALWTRP are:

- No buoy line floating at the surface.
- Gear must be hauled out of water at least once every 30 days.
- In most waters, surface buoys and lines must be marked to identify vessel or fishery.
- All buoys, flotation devices, and/or weights must be attached to the buoy line with a weak link.
- In most waters, groundline must be made of sinking line.
- All buoy lines need to be marked three times (top, middle, bottom) with three marks along a 12-inch area.
- Certain trawls must contain a minimum number of traps based on area fished and miles from shore.[300]

165. The District Court for the District of Columbia held that the 2014 Biological

---

[296] Ex. 671 at 176; Ex. 1030 at 1-5–1-6.

[297] Day 1 Trial Tr. 15:18–16:21; Day 2 Trial Tr. 45:5–15. Daniel McKiernan has served in that role for approximately 20 years, with Bob Glenn acting as proxy for DMF within the last ten years. Day 2 Trial Tr. 45:5–46:13.

[298] Ex. 594B at 13 fig. 3; *see also* Appendix §§ F, H, K–M.

[299] *See* Ex. 671 at 176–77; Ex. 1030 at 3-45; Ex. 594B at 13 fig. 3; *see also* Appendix §§ P, R.

[300] Ex. 671 at 177; Ex. 1031 at 2-2–2-6; Ex. 1030 at 3-45; 50 C.F.R. § 229.32(c)(3); *see also* Appendix §§ P, R.

Opinion that served as the basis for the ALWTRP's regulations violated the ESA and MMPA and vacated that BiOp.[301]

166. The Appendix chronicles from the Federal Register the saga of NMFS rulemaking with respect to the North Atlantic right whale and the American Lobster fishery.

167. *No negligible impact determination*. As early as August 1995, NMFS published notice that it would not issue interim incidental taking permits § 101(a)(5)(E) of the MMPA to vessels engaged in certain fisheries (including the American Lobster fishery) for the North Atlantic right whale (and several other whale species) because it was "unable to determine that the mortality and serious injury incidental to commercial fishing operations will have a negligible impact."[302] As the Appendix shows, since that time and to this day, and despite numerous episodes of revised rule making and related biological opinions regarding the American Lobster fishery, NMFS has not once even purported to make the required negligible impact determination for commercial fisheries under § 101(a)(5)(E) with respect the North Atlantic right whale.[303] In short, for over 27 years, the incidental serious injury and mortality to the endangered North Atlantic right whale by the American Lobster fishery has been in violation of the MMPA because no determination of negligible impact as required under § 101(a)(5)(E) (for commercial fisheries) or §§ 101(a)(5)(A) and (D) (for non-commercial fisheries) has ever been made.

168. As previously shown, it is undisputed that actual serious injury and mortality to the North Atlantic right whale from the American Lobster fishery activities alone has far exceeded the

---

[301] *Ctr. for Biological Diversity v. Ross*, No. 18-cv-112, 2020 WL 1809465, at *8 (D.D.C. Apr. 9, 2020).

[302] 60 Fed. Reg. 45,399, 45,400 (Aug. 31, 1995); *see also* Appendix § B.

[303] *See, e.g.*, Appendix ¶¶ 13, 24, 37, 64, 74.

potential biologic removal for that species for about 25 years.[304] A "negligible" impact is a small fraction of the potential biologic removal limit (under the early regs, 0.1 of the PBR; under the June 2020 guidance, 0.13 of the PBR).[305] Activities of the American Lobster fishery—primarily entanglements—prevent the fishery from being exempted under § 101(a)(5) from the ongoing taking of the North Atlantic right whale.

169. *No take plan that meets the MMPA mandated goals*. The first version of the ALWTRP in 1997 purported to be shaped to meet the mandates under § 1387 of the MMPA: for the first iteration of the ALWTRP, NMFS stated that it believed the plan would meet the required short term (six months) goal of reducing serious injury and mortality below the potential biological removal requirement and would meet the long term (by April 2001) requirement of approaching a zero-mortality rate goal for the right whale.[306]

170. But as detailed in the Appendix, efforts by the ALWTRP to reduce right whale entanglements and serious injury and mortality to North Atlantic right whales have failed miserably.[307] The potential biological removal for the right whale has been exceeded by interactions

---

[304] Day 1 Trial Tr. 20:21–22:6 (Commonwealth acknowledged that the American Lobster Fishery's impact has exceeded the North Atlantic right whales PBR level annually for the last 25 years); Ex. 1030 at 2-37 (only one year since 2010 in which entanglement-related SI/M first seen in U.S. waters or known to be caused by U.S. gear was below PBR).

[305] *See supra* ¶¶ 41–43.

[306] *See* 62 Fed. Reg. 39,157, 39,160 (July 22, 1997); *see also* Appendix §§ F, H.

[307] *See, e.g.*, 84 Fed. Reg. 37,822, 37,822 (Aug. 2, 2019) ("The North Atlantic right whale population has been declining since 2010, and the most recent estimate indicates a population of no more than 411 individuals at the end of 2017. . . . [A] primary cause of significant injury and mortality of North Atlantic right whales is entanglement in fishing gear. With mortalities continuing to outpace births, the population decline is continuing, and further mitigation of entanglements that cause serious injury or mortality is needed."); 79 Fed. Reg. 36,586, 36,589 (June 27, 2014) ("When considering only entanglements from U.S. fisheries, right whales are

with the American Lobster fishery in almost all the last 25 years.[308]

171. The ALWTRP has been amended numerous times, often with little regard to whether the MMPA short- and long-term mandates would be met.[309]

172. The 2014 BiOp established new "triggers," i.e., limits of future serious injury and mortality to the North Atlantic right whale which, if exceeded, would warrant re-opening the process to consider further regulations.[310] But the trigger points *exceeded* the already established demands of the MMPA.[311]

173. NMFS's most recent effort continues its past failures; in the 2021 BiOp, NMFS projects that even with the planned measures in place, entanglements from the federal component alone of the American Lobster fishery will seriously injure or kill 2.69 North Atlantic right whales on average each year (a level exceeding the current 0.8 PBR for the right whale from *all* sources of anthropogenic SI/M).[312] And since the first phase goes on for several years (with no precise new

---

being taken at too great a rate to maintain optimal population sustainability."); 70 Fed. Reg. 35,894, 35,896 (June 21, 2005) (noting "evidence that the [reasonable and prudent alternative] described in the [2014 BiOp] is not effective at avoiding the likelihood of jeopardizing the continued existence of right whales by the lobster trap fishery"); 66 Fed. Reg. 49,896, 49,897 (Oct. 1, 2001) (2001 BiOp concluding that the lobster fishery "jeopardized the continued existence of the North Atlantic right whale"); 65 Fed. Reg. 80,368, 80,368 (Dec. 21, 2000) ("Since the ALWTRP final rule was published in February 1999, entanglements of whales have continued to occur. . . . Because of the critical status of the right whale population, there is an urgent need to reduce entanglement."). *See generally* Appendix §§ I–V.

[308] *See supra* ¶ 85.

[309] *See, e.g.*, 80 Fed. Reg. 30,367 (May 28, 2015); 79 Fed. Reg. 36,586 (June 27, 2014); 72 Fed. Reg. 57,104 (Oct. 5, 2007); 68 Fed. Reg. 51,195 (Aug. 26, 2003); 67 Fed. Reg. 1,300 (Jan. 10, 2002); 5 Fed. Reg. 80,368 (Dec. 21, 2000); *see also* Appendix §§ I, K–M, P, R.

[310] *See* Appendix ¶ 75.

[311] *See id.* ¶¶ 72, 75.

[312] Ex. 671 at 226 tbl. 62.

measures outlined for subsequent years), the new ALWTRP amendments plan to serious injure or kill 3.3 right whales through operation of the American Lobster fishery for long to come.[313]

174. In short, NMFS has never authorized the American Lobster fishery to take the North Atlantic right whale, let alone authorized it to seriously injure or kill right whales. Given the depleted level of right whale stock and its risk of extinction, NMFS has both been unable to issue the required § 101(a)(5) negligible impact determination nor fashion (after its first, naïve effort) a § 1387 ALWTRP that NMFS could state it believed would meet the statutory mandates.

175. The failed efforts of NMFS to comply with MMPA requirements through the ALWTRP only apply to commercial fishing activities; NMFS has not even tried (or been asked) to authorize recreational trap/pot fishing.[314] The MMPA has separate requirements under § 101(a)(5) by which noncommercial fishing may, for set periods, receive an incidental take permit.[315] There is no suggestion in the evidence that NMFS has ever been asked to authorize recreational trap/pot fishing under those sections.

176. As detailed in the Appendix, the 1997 plan failed to achieve the statutory

[313] *Id.* (including both state and federal fisheries).

[314] 16 U.S.C. § 1387(f) (requiring a take reduction plan for each strategic stock with interactions with a commercial fishery); *see also* 62 Fed Reg. 39,157, 39,157–58 (July 22, 1997). (noting that the immediate and long term goals of a take reduction plan are to reduce "the mortality and serious injury" of strategic marine mammal stocks "taken *in the course of U.S. commercial fishing operations*" (emphasis added)).

[315] *See supra* ¶¶ 33–34.

mandates.[316] And despite repeated changes to the ALWTRP,[317] every effort for the past 25 years has failed to do so.[318]

**H. Past conservation efforts by DMF failed to abate to required levels serious injury and death to North Atlantic right whales.**

177. DMF has implemented a series of measures over the last two decades.[319] These measures, like the federal measures described above, focus on limited time-area closures and modification of gear.[320] They include requiring all VBRs be fitted with a 500-pound "weak link" and that groundlines be negatively buoyant.[321]

178. In 2015, DMF implemented a seasonal closure period for Cape Cod Bay.[322]

---

[316] *See* 65 Fed. Reg. 80,368, 80,368 (Dec. 21, 2000) ("Since the ALWTRP final rule was published in February 1999, entanglements of whales have continued to occur. . . . Because of the critical status of the right whale population, there is an urgent need to reduce entanglement."); 64 Fed. Reg. 7,529, 7,531 (Feb. 16, 1999) (NMFS was "unable to determine whether the short-term goal of the Plan was met," and it was "impossible to demonstrate conclusively that the goals of the MMPA were achieved."). *See generally* Appendix.

[317] *See* Ex. 671 at 176–77; Ex. 1030 at 3-45; Ex. 594B at 13 fig. 3.

[318] *See* Ex. 671 at 176, 83 (anthropogenic mortality limits recovery of North Atlantic right whales).; Ex. 1030 at 2-40; *id.* at 2-37 (only one year since 2010 in which entanglement-related SI/M first seen in U.S. waters or known to be caused by U.S. gear was below PBR); Day 1 Trial Tr. 20:21–22:6 (Commonwealth acknowledged that the American Lobster Fishery's impact has exceeded the North Atlantic right whales PBR level annually for the last 25 years); *see also* Appendix §§ J, K, O, Q.

[319] *See* 322 Mass. Code Regs. § 12.00. In 1995, the plaintiff filed suit against the Commonwealth for violations of the ESA. This Court required the Commonwealth to convene a multi-disciplinary "endangered whale working group," and, subject to the Court's supervision, implement regulatory measures recommended by that group. *Strahan v. Pritchard*, 473 F. Supp. 2d 230, 233 (D. Mass. 2007).

[320] DMF also began conducting aerial and vessel surveillance of Cape Cod Bay, Day 1 Trial Tr. 43:2-16, and implemented vessel speed restrictions, Day 6 Trial Tr. 118:22-119:1.

[321] *See* Day 11 Trial Tr. 16:18-20, 17:22-18:10, .

[322] *Id.* ¶¶ 14–15; Day 1 Trial Tr. 52:15–53:6; Day 6 Trial Tr. 43:7–24. Effective March 22, 2019, DMF promulgated 322 Mass. Code Regs. § 12.04(3) that authorized the Director of DMF to

179. The impact of the closure on the lobster industry was nominal; analysis conducted by DMF demonstrated that for the period of the year (February through April/May for the years 2015 through last year) and location (mostly Cape Cod Bay), less than 2% of the annual landings were impacted by the closure.[323]

180. Other efforts by DMF over the years have, understandably, tracked those of NMFS (since both are coordinated, and arise out of the same ALWTRP recommendations).[324] Thus, despite the Bay closure and other efforts by DMF, entanglements continued to rise.[325]

181. The Commonwealth acknowledges that since enactment of the 1994 amendments to the MMPA, it has only once applied for an incidental take permit (back in the mid-1990s, after this Court ordered it to do so in *Coxe*).[326] That permit request, relating to commercial fishing only, was denied.[327]

182. And in the 25 or so years since, the Commonwealth acknowledges it has obtained an incidental take permit.[328]

183. In short, DMF has never obtained authorization by which its licensing of commercial and recreational trap/pot fisherpersons could be lawful under the ESA and the

---

adjust the duration of the fixed gear seasonal closures if North Atlantic right whales remained in the area past April 30. In addition to Cape Cod Bay, the closure encompasses Stellwagen Bank, and the Outer Cape Cod Lobster Management Area. Ex. 232 at 1.

[323] Day 2 Trial Tr. 62:4–24; Day 6 Trial Tr. 44:20–46:21, 49:4–11.

[324] *See generally* Day 1 Trial Tr. 15:18–6:16; Day 5 Trial Tr. 100:5–21.

[325] *See* Day 1 Trial Tr. 20:11–21:5.

[326] Day 11 Trial Tr. 53:12–55:8.

[327] *Id.* at 54:23-55:8.

[328] Day 1 Trial Tr. 39:13–17.

MMPA.

## I. Current efforts by NMFS will fail to abate to required levels serious injury and death to North Atlantic right whales.

### 1. NMFS proposed new conservation efforts.

184. In response to the Unusual Mortality Event that began in 2017,[329] NMFS tasked the ALWTRT with finding ways to reduce entanglement risk.[330] NMFS did not direct the ALWTRP to meet statutory mandates (of believing its efforts will achieve PBR and zero mortality growth rate within the prescribed time periods).[331] Instead, it identified the need for a 60%–80% reduction to U.S. entanglement-related SI/M events (i.e., to no more than four SI/M events in a five-year period) and targeted the Northeast lobster fishery because it deploys more than 95% of the VBRs fished along the east coast.[332] The ALWTRT focused on recommendations to achieve the lower 60% target.[333]

185. In 2019, NMFS developed a Decision Support Tool (DST) to aid in the evaluation of proposed measures to reach the 60% target.[334] The DST calculates entanglement risk based on three factors: VBR density, whale density, and the amount of risk different gear configurations

---

[329] *See, e.g.*, Ex. 671 at 82.

[330] Ex. 1030 at 3-46.

[331] *See generally* Ex. 1030.

[332] Ex. 1030 at 3-46 (two subgroups of the advisory team were created: one charged with investigating weak rope, the other with investigating ropeless fishing). The lobster fishery accounts for 93.73% of the VBRs in Northeast waters. *Id.* at 2-34, 2–40.

[333] *Id.* at 3-47.

[334] *Id.* at 3-47, 3-50. NMFS had earlier developed a risk-reduction model to help determine what relative risk reductions could be achieved by gear configuration changes and/or reductions in fishing effort by area based on the co-occurrence of lines and whales. Ex. 671 at 177.

pose to large whales (gear threat per line).[335] To assign varying threat levels to different gear configurations, NMFS relied on data collected by the Commonwealth's expert, Amy Knowlton.[336]

186. In December 2020, NMFS released a Draft Environment Impact Statement (DEIS) addressing proposed changes to the ALWTRP.[337] NMFS evaluated three approaches, or alternatives, to modifying the ALWTRP.[338] The scope of this evaluation was confined to the Northeast region where North Atlantic right whales swim nearly year-round and where the vast majority of buoy lines are fished.[339]

187. NMFS selected Alternative Two as its proposed rule and asserted, based on DST modeling, that this plan will achieve at least a 60% risk reduction.[340] Alternative Two's modifications to the ALWTRP include:

- **Trawling up.** Increase the number of traps per trawl according to distance from shore.

---

[335] *Id.* at 212–13. There are three sources of data used in the DST: (1) state and federal reports on quantities and locations of fishing gear deployed, (2) the Duke University whale habitat model, which approximates density of whales over times in the American Lobster fishery, and (3) rope breaking strength data. Day 7 Trial Tr. 102:8–103:16. Dr. Burton Shank, a NMFS research fishery biologist who conducts population modeling for the agency and helped develop the DST, offered no opinion on the reliability of these datasets. *Id.* at 102:14–18, 103:6–16.

[336] *Id.* at 76:13–78:6 ("[T]hat portion of the model is based around a variety of data sources on what diameters of rope fishermen are using under different circumstances, what the breaking strengths of those rope diameters are, and then information or data that was supplied to me from the New England Aquarium for the breaking strengths of ropes that were recovered from entanglements.").

[337] *See* Ex. 1030.

[338] *Id.* at 1-1. The first alternative made no change to the ALWTRP. *Id.* at 1-10, 3-54. The third alternative would have closed more areas to VBRs, tightened allocation of VBRs, required more line be converted to "weak rope," and imposed more stringent gear marking requirements. *Id.* at 1-11, 3-56–3-58.

[339] *Id.* at 3-44.

[340] *Id.* at 1-18.

- **Seasonal restricted areas.** Establish a new seasonal restricted area closed to VBR fishing north of the current Massachusetts Bay Restricted Area and south of Nantucket from February through April. Allow conditional permits for ropeless fishing in Massachusetts and Great South Channel Restricted Areas.

- **"Weak Rope."** Add weak inserts at depths based on distance from shore or use full "weak rope" (i.e., 1,700-lb test) at the same depth.

- **Gear marking.** Require one state-specific three-foot colored mark within two fathoms of the buoy, two additional marks in top and bottom half of gear in state waters, three in federal waters including a green six-inch mark in top two fathoms of line within one foot of long mark.[341]

**2. The Marine Mammal Commission (MMC) responds to NMFS's proposals.**

188. On August 12, 2019, the Marine Mammal Commission (MMC)[342] wrote NMFS, urging the agency to take more action "to prevent unsustainable numbers of deaths [of North Atlantic right whales] such as occurred in 2017 and 2019, and to put the population back on a path to recovery."[343] The MMC opined that the DST being developed by NMFS (also known as the "risk reduction assessment tool" in the letter) should be improved and refined, particularly the injury severity measures that the tool used to calculate relative risk, as the severity measures were based on a poll of Take Reduction Team members, many of whom were "not experts on the injury threat to right whales posed by different gear types and configurations."[344] The MMC

[341] *Id.* at 1-7–1-8, 3-54–3-56, 3-58–3-59.

[342] The MMC comprises three members, each appointed by the President and confirmed by the Senate, knowledgeable in marine ecology and resource management. 16 U.S.C. § 1401(b)(1). The MMC's mandate is to review activities of the United States pursuant to existing laws and international conventions relating to marine mammals and recommend such steps as it deems necessary or desirable for the protection and conservation of marine mammals. *Id.* § 1402(a)(1)–(4). Recipients of MMC letters are required to respond to the MMC and explain why any MMC recommendations were not followed or adopted. *Id.* § 1402(d).

[343] Ex. 150 at 1.

[344] *Id.* at 3.

recommended that "NMFS conduct a rigorous, best-practice expert elicitation to assess the risk posed by different gear configurations, or find some other means to put the severity measures on a firmer scientific footing."[345]

189. On February 19, 2021, the MMC wrote NMFS to address shortcomings in the December 15, 2020, draft biological opinion, including the failure of the included incidental take statement to account for expected lethal take of right whales and the "conjectural" nature of the proposed amendments to the Atlantic Large Whale Take Reduction Plan, which included static time-area closures, trawling up requirements, and weak-line measures.[346] Noting that "NMFS has been attempting to . . . reduce incidental mortality and serious injury to below the species' potential biological removal level within six months of take reduction plan implementation—for 25 years," the MMC stated: "Given this track record, it is likely 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."[347]

190. The MMC was particularly concerned that NMFS had issued a no-jeopardy finding, stating that this determination "defies logic and common sense."[348] The MMC criticized the determination for being based on speculative future actions rather than on the effects of the concrete proposed actions, and that these actions may be inadequate.[349]

---

[345] *Id.* at 3.

[346] Ex. 154 at 5, 10.

[347] *Id.* at 10.

[348] *Id.* at 8.

[349] *Id.* at 10. The MMC also criticized NMFS for "once again [] 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. *Id.* at 10. The MMC observed that there was "little

191. On March 1, 2021, the MMC wrote NMFS to comment on the DEIS and the proposed change to the ALWTRP.[350] The MMC found that NMFS's proposed change to the ALWTRP—Alternative Two (or the Preferred Alternative)—was "substantially inadequate" and in need of "extensive revision."[351]

192. The MMC asserted that NMFS had set a risk reduction target "substantially too low" in light of NMFS's long-standing failure to reduce SI/M to required levels, uncertainty regarding the efficiency of the newly proposed measures, underestimation of the expected risk reduction due to double counting, and NMFS's failure to set a target that adequately takes account of unobserved deaths (cryptic mortality).[352] The MMC urged NMFS to set a much more risk-averse target for risk reduction.[353] The MMC recommended that instead of adopting Alternative Two, NMFS adopt and expand Alternative Three.[354] Specifically, the MMC recommended that NMFS implement measures designed to achieve an expected risk reduction sufficiently in excess of 80% to account for performance uncertainty, double counting, and the best-available scientific estimate of the total mortality rate.[355]

---

hard evidence that past measures have had the intended effect or have been adequate in helping to meet the mandates of the ESA and MMPA." Ex. 154 at 11.

[350] Ex. 156.

[351] *Id.* at 2.

[352] *Id.* at 3.

[353] *Id.* at 3.

[354] *Id.* at 3, 9–10. The third alternative would have closed more areas to VBRs, tightened allocation of VBRs, required more line be converted to "weak rope," and imposed more stringent gear marking requirements. *See* Ex. 1030 at 1-11, 3-56–3-58.

[355] Ex. 156 at 3, 7–8 (urging NMFS to reassess target risk reduction).

### 3. The 2021 Biological Opinion

193. Shortly before trial, NMFS issued a final 2021 Biological Opinion to support the new federal regulations.[356]

194. No testimony was adduced at trial regarding the reliability (i) of the historic data contained in the 2021 BiOp or (ii) of the future projections NMFS reaches (other than testimony from Mr. Shank about certain Massachusetts-specific runs, discussed later). As to the historic information, however, it appears to be largely uncontested and well supported by substantial, peer-reviewed literature.

195. The purpose of the 2021 BiOp is to determine whether the continued operation of *the federal portions* of the American Lobster Fishery (and several others) will appreciably reduce the North Atlantic right whale's likelihood of survival and recovery.[357]

196. The 2021 BiOp analyzes historical impacts of trap/pot fishing in both federal and state waters on the North Atlantic right whale, and these observations are relevant to estimations of the effects of fishing in state waters on right whales. The 2021 BiOp then estimates the separate extent to which effort in federal versus state water efforts is responsible. It then indicates that its proposed action only relates to activities in federal waters (or by federal permittees travelling through states waters to get to federal waters; "As NMFS does not authorize, fund, or carry out fishing activities in state waters, these activities are not considered part of the proposed action in this [BiOp]."[358]

---

[356] Ex. 671.

[357] *Id.* at 2, 323–24.

[358] Ex. 671 at 6 (In past opinions, NMFS was unable to separate out the effects from federally permitted vessels fishing in state waters from those fishing in federal waters); *see also id.* at 208

**a. The 2021 BiOp estimates that U.S. fishing gear entangles more than 15% of the North Atlantic right whale population annually.**

197. NMFS apportioned 50% of the observed SI/M (plus cryptic mortality) due to vessel strikes and entanglements to United States and 50% to Canada. Between 2010 and 2017, NMFS estimated that 30.25% of right whales acquired new wounds or scars from fishing gear, on average, annually.[359] Assuming 50% of this 30.25% are attributable to U.S. fishing gear, NMFS determined that an average of 15.125% of the right whale population becomes entangled annually in U.S. fishing gear (federal and state waters).[360]

198. To capture how much risk from trap/pot gear is occurring in state versus federal waters, NMFS used the DST to assess the risk reduction that would occur if all federal waters were closed to all trap/pot fishing gear.[361] Based on this modeling, NMFS decided 39.6% of the estimated right whale entanglements occurring in U.S. trap/pot gear happens in state waters and 60.4% occurs in federal waters.[362]

199. NMFS then estimated that between 2010 and 2018, U.S. fisheries caused an annual average of 7.7 North Atlantic right whale SI/M.[363] Based on its percentage breakdown between federal and state harm to right whales, NMFS apportioned 4.7 right whale SI/M to

---

(state and Canadian entanglement events were not included in analysis because they are not result of authorizing U.S. federal fisheries).

[359] *Id.* at 212–13, 221.

[360] *Id.* at 221; *see also* Ex. 1030 at 2-37–2-41 (discussing allocation between Canada and the United States).

[361] Ex. 671 at 219.

[362] *Id.* at 219. NMFS determined that an average of 9.14% of the right whale population is entangled annually in U.S. federal fishing gear. *Id.* at 223.

[363] *Id.* at 222.

federal fisheries and 3 right whale SI/M to state fisheries.[364]

**b. The 2021 BiOp estimates that even with the new regulations, U.S. fishing gear will seriously injure or kill 7.57 right whales a year.**

200. The 2021 BiOp estimates that—even with the new NMFS regulations—U.S. fishing gear (from federal and state waters) will seriously injure or kill 7.57 right whales a year.[365] *This is over 7 times the 0.8 PBR* and does not account for additional anthropogenic causes.[366]

201. As part of the BiOp, NMFS developed a North Atlantic Right Whale Conservation Framework.[367] The framework includes the proposed ALWTRP measures[368] and is to be implemented in four phases.[369]

202. The framework ostensibly seeks—finally in the *tenth year* of operation—to then reduce the incidence of SI/M to North Atlantic right whales in the federal fisheries to an annual average of 0.136 SI/M.[370] However, it acknowledges that even with the new ALWTRP regulations, SI/M *several times larger* than the PBR will continue to persist for years (see below), and it has no specific plans thereafter by which the injuries and killing will cease.[371]

203. In phase 1, NMFS will implement the ALWTRP proposed rule[372] targeted on a

[364] *Id.* at 160, 223–24, 325.

[365] *Id.* at 223–24.

[366] *Id.*

[367] *Id.* at 7.

[368] *Id.* at 6, at 9–11; *see also* Ex. 1030 at 3-54–3-58.

[369] Ex. 671 at 8, 224.

[370] *Id.* at 228.

[371] *Id.* at 225–28.

[372] *Id.* at 225.

60% reduction in right whale SI/M incidental to the American lobster fishery.[373] Table 62, below, presents NMFS's anticipated annual averages of right whale SI/M after the Phase 1 measures are implemented.[374]

Table 62: Annual average number of right whale M/SI entanglements with measures implemented under the ALWTRP proposed rule, based on apportionments calculated using the DST

| | Estimated M/SI in trap/pot gear (60.4% Fed) | Reduction of M/SI with measures implemented under the proposed rule (26.6% Fed) | Remaining M/SI in trap/pot gear with measures implemented under the proposed rule | % Risk reduction in trap/pot gear | Remaining M/SI with measures implemented under the proposed rule (including gillnet) |
|---|---|---|---|---|---|
| State | 3 | 2.39 | 0.61 | 79.7% | 0.61 |
| **Federal** | **4.57** | **2.01** | **2.56** | **44%** | **2.69** |
| Total | 7.57 | 4.4 | 3.17 | 58.1% | 3.3 |

204. NMFS concluded that even after the ALWTRP changes are implemented, federal fisheries will still entangle an annual average of 9.14% of the right whale population, resulting in an annual average of 2.69 SI/M.[375] Phase 2 will target non-lobster fisheries and assess progress.[376] NMFS expects an annual average of 2.61 SI/M to right whales due to federal fixed-gear fisheries during phase 2.[377]

205. In phase 3, NMFS says it will implement rulemaking in 2025 to further reduce SI/M by 60% in all federal fixed gear fisheries.[378] NMFS says this will reduce SI/M, on average

[373] *Id.* at 8, 224.

[374] *Id.* at 226 tbl. 62.

[375] *Id.* at 226.

[376] Phase 2 will implement measures to reduce right whale SI/M in other federal trap/pot fisheries (i.e., red crab, scup, black sea bass) and federal gillnet fisheries by 60%. *Id.* at 226. The team will convene in 2021 to recommend modifications to the ALWTRP to address risk in federal fixed gear fisheries not included in phase 1; in 2023, NMFS will implement the recommended changes. In 2023–24, NMFS will assess progress toward the goals of the framework. *Id.* at 8.

[377] *Id.* at 8, 227, 325.

[378] *Id.* at 227.

annually, to 1.04 (but it has no specific plan as to how).[379] In 2025–26, NMFS will evaluate the measures implemented in 2025 and the right whale population to determine whether any additional measures are warranted.[380]

206. Finally, in phase 4—in 2030—NMFS says it will implement regulations to further reduce SI/M by an additional 87% to an annual average of 0.136 right whale SI/M entanglements in federal waters—approximately one SI/M every seven years.[381] Again, without any specific plan.

207. The 2021 BiOp sets forth no specific regulatory efforts that will in fact implemented to achieve these goals.[382]

**c. The 2021 BiOp contains no negligible impact determination.**

208. In the 2021 BiOp, NMFS included an incidental take exemption for *federal* fisheries with respect to their non-lethal take of North Atlantic right, fin, sei, and sperm whales.[383] The 2021 BiOp, however, does not contain a negligible impact determination to serve as the basis for the ostensible non-lethal incidental take exemption.[384]

209. The lawfulness of the 2021 BiOp is the subject of litigation in *Center for Biological Diversity v. Ross*.[385]

210. The 2021 BiOp is limited to federal proposed actions.[386] While the 2021 BiOp

---

[379] *Id.* at 228.

[380] *Id.* at 8, 228, 325.

[381] *Id.*

[382] *See id.* at 225–28 (no measures specified other than changes to ALWTRP).

[383] *Id.* at 390. The BiOP did not include a negligible impact determination.

[384] *See generally id.* at 390.

[385] No. 18-cv-112 (D.D.C.).

[386] Ex. 671 at 341.

purports to authorize some federal actions, it does not purport to authorize either commercial or recreational trap/pot fishing in Massachusetts jurisdictional waters.[387]

**J. Current efforts by DMF will not abate serious injury and death to North Atlantic right whales to required levels.**

**1. The 2021 DMF trap/pot fishing regulations.**

211. In spring 2021, DMF implemented further regulatory changes:

- An extension of the Massachusetts Bay Restricted Area to include state waters north of Cape Cod Bay from February 1 until April 30. From May 1 through 15, the closure will occur on a dynamic basis allowing DMF to lift the closure (or parts thereof) if whales no longer remain in state waters.[388]
- A prohibition on buoy lines greater than 3/8" in diameter in state waters.[389]
- A requirement that all commercial trap fishermen to fish buoy lines that break when exposed to 1,700 lbs of tension beginning on May 1, 2021. This may be achieved by fishing specially manufactured buoy lines with a custom 1,700-lb breaking strength or by inserting NOAA Fisheries approved contrivances into the top 75% of the buoy line every 60.'[390]
- A recreational lobster and crab trap haul-out period of November 1 – May 15 (beginning on November 1, 2021) throughout all of state waters.[391]

212. The new regulations do not reflect all the original proposals which DMF believed would reduce risk (e.g., a ban on singles for boats larger than 29 feet and a haul-out period a month longer[392]).

[387] Day 5 Trial Tr. 172:21-23; Day 6 Trial Tr. 26:13-20; *see generally* Ex. 671.

[388] Ex. 232 at 1; Ex. 225 at CW035578–79.

[389] Ex. 232 at 1; Ex. 225 at CW035579.

[390] Ex. 232 at 1; Ex. 225 at CW035579.

[391] Ex. 232 at 2; Day 10 Trial Tr. 113:8–114:1.

[392] Ex. 1010 at CW087946.

**2. The requirement to extend the closure will reduce only marginal risk.**

213. Because the Commonwealth maintains the data for the statistical reporting areas (SRAs), one can estimate the maximum level of trap/pot fishing effort that the new regulations for an extension of the closure of Cape Cod Bay for waters north of the Cape will have.

214. In evidence are the annual reports of fishing effort by statistical area. The total level of trap/pot fishing in Massachusetts waters on an annual basis, measured by the estimated number of vertical buoy lines in the water, is 305,568.[393] The total level of eliminated trap/pot fishing in Massachusetts waters on an annual basis in SRAs 1–5 (areas north of Cape Cod Bay), measured by the estimated number of vertical buoy lines in the water, is 11,904.[394] As a result, the maximum amount of reduced lines from extension of the closure is about 3.9%. This is a maximum as it does not account for any shift of lines to federal waters (which then would become a source of entanglement, and diminished conservation efficacy).

**3. The requirement to use 1,700-lb breaking strength rope will not prevent harm.**

215. Based upon a single, six-year-old paper authored by Ms. Amy Knowlton entitled *Effects of Fishing Rope Strength on the Severity of Large Whale Entanglements*,[395] the Commonwealth has enacted a new 1,700-lb breaking strength rope requirement.[396]

216. Apart from general testimony about the seriousness and ubiquity of right whale entanglements (all of which is generally uncontested), the Knowlton paper and her other testimony

[393] Ex. 670 tbl. 1 (sum of estimated lobster pot fishery max vertical lines in areas 1–14 for all months).

[394] *Id.* (sum of max vertical lines in areas 1–5 for February, March, and April).

[395] Ex. 1122.

[396] Ex. 225 at CW0355789; Ex. 232 at 1.

made three claims: (a) adoption of 11,700-lb breaking strength rope could significantly reduce severe or moderate injuries to right whales; (b) adoption of 1,700-lb breaking strength rope could reduce the number of life-threatening entanglements by at least 72%; and (c) that only serious entanglements result in negative health impacts to right whales.[397] None of these assertions holds up to scrutiny.

**a. The conclusion that adoption of 1,700-lb breaking strength rope would significantly reduce severe or moderate injuries to right whales is not supportable.**

217. The focus of the Knowlton paper is an analysis conducted to draw conclusions about the relative outcomes of entanglement severity depending on the strength of rope retrieved from entangled or dead whales, with 1,700-lb break strength rope being a critical level.[398]

218. The authors tested the breaking strength of both the entangling rope recovered (the "estimated" breaking strength) and a brand-new version of the same rope (the "new" breaking strength).[399] The authors then classified each entanglement injury as minor, moderate, or severe.[400]

219. The paper acknowledges that no statistically significant relationship for rope strength was shown between minor to moderate injuries, or moderate to serious injuries, for right whales.[401] Nevertheless, because of a statistically significant relationship between minor to serious injuries, the authors concluded that 1,700-lb new breaking strength rope is less likely to cause

[397] *See infra* Section III.J.3.a–c.

[398] *See* Ex. 1122 at 318.

[399] *Id.* at 320.

[400] Day 6 Trial Tr. 125:23–126:2, 133:11–22, 135:18–136:3.

[401] Ex. 1122 at 324.

severe or moderate injury to right whales.[402]

220. The data points for the right whale entanglements appear to contradict the paper's basic finding. Of the 30 entanglements, 3 occurred with 1,700-lb new rope.[403] Of those, 2 caused severe injuries and 1 caused moderate injuries.[404] In other words, 100% of the time a whale was entangled in the new 1,700-lb test rope, the rope caused severe or moderate injuries. (Of the other 26 entanglements which were for the stronger test ropes, 13 were severe, 10 were moderate and 4 were minor; in other words, minor injuries were only found with the stronger new test rope).[405]

221. *Data availability*. Ms. Knowlton testified that well over 1,600 entanglements of right whales have been documented from scarring evidence.[406] However, only 132 ropes have been retrieved from 70 entanglements from all large whale types (including 30 entanglements from 28 North Atlantic right whales).[407] This retrieval effort covers 4% of all right whale entanglements.

222. *Unknown real rope strength*. The authors could not know how strong the rope was at the time of entanglement, since it was unknown how old the rope was when it entangled the whale and/or how long the rope had been entangling the whale.[408] Therefore, the study assumed that all

---

[402] Day 6 Trial Tr. 146:2–9; Day 7 Trial Tr. 18:15–19, 61:19–62:1. Not all correlations for all species of whale studied were statistically significant. Ex. 1122 at 325.

[403] Day 7 Trial Tr. 120:22–25.

[404] *Id.* at 121:1–4.

[405] *Id.* at 122:4–20.

[406] Day 6 Trial Tr. 129:10–13.

[407] Ex. 1122 at 318, 320–21. Of the thirty North Atlantic right whales in the study, seven were adults. The remainder ranged in age from a six-month-old calf to an eight-year-old juvenile. Day 7 Trial Tr. 11:19–25.

[408] Day 7 Trial Tr. 9:19–10:1.

ropes were as sturdy at the time of entanglement as they were when they were manufactured,[409] when they were at their strongest. The authors did not conduct any analysis on the age of ropes at the point of entanglement, nor how fast new rope degrades.[410] The authors also did not compare the "estimated rope strength"—the tested strength of the retrieved rope—to the severity of the injuries caused by the rope.[411]

223. *Unknown quantity of rope and of what strength present in the ocean*. The authors did not present any data concerning how much rope of what strength was present in the water during the study period.[412]

224. *Multiple ropes*. Some entanglements involved multiples ropes.[413] In these cases, the authors only used the data from the rope with the strongest new rope test (70 out of 132 ropes collected); the weaker ropes in such circumstances were not considered.[414] This resulted in 47% of the available data—data from weaker ropes—not being used.[415] Furthermore, in cases with multiple ropes, it was not possible to determine the order of entanglement events.[416] Therefore, it is possible

[409] Ex. 1122 at 320.

[410] Day 7 Trial Tr. 49:23–50:1.

[411] *Id.* at 126:18–127:3.

[412] *Id.* at 49:23-50:21; 171:20-127:1; *see generally* Ex. 1122.

[413] Day 7 Trial Tr. 50:22-25.

[414] *Id.* at 51:1–14; Ex. 1122 at 320.

[415] Day 7 Trial Tr. 53:12–54:3. Although none of the excluded ropes had a new breaking strength of under 1,700 lbs per square foot, some did have *estimated* strengths that were lower than 1,700 lbs. Day 9 Trial Tr. 159:18–23, 169:24–170:2.

[416] Ex. 1122 at 325.

the weakest rope first entangled the whale.[417] Ms. Knowlton acknowledged that she and her co-authors could have used all of the data, but they did not.[418]

225. *Number of right whales*. Because ropes are rarely recovered from entangled whales,[419] the authors only had data for seven adult North Atlantic right whales. Ms. Knowlton acknowledged that the sample size may not be a "good representation of the overall population of adult right whales out there."[420]

226. *The date of the data*. The study's data was collected from entanglements from 1994 to 2010: no whale entanglements in the last 11 years were sampled.[421] (As explained above, North Atlantic right whales have gotten smaller in the intervening ten years and that decreased size translates to decreased strength).[422]

**b. The conclusion of 72% entanglement is wrong and highly misleading.**

227. Ms. Knowlton's paper included a broad statement in addition to the regression results discussed above: the "broad adoption of ropes with breaking strengths of 7.56 kN (1,700 lbsf) could reduce the number of life-threatening entanglements for large whales by at least

---

[417] Day 7 Trial Tr. 51:15–19, 131:25–132:2; *see also* Day 4 Trial Tr. 85:18–86:7, 88:2–20 ("[W]hat they have in terms of evidence was the gear that was taken off of entangled whales. But the concern—and it's even expressed in their own paper—is the gear that they end up with at the end may not be the same as the gear that the animal initially became entangled in. So . . . it may not be characteristic of the actual lines and gear that the whale became entangled in. So it's a bit of [] a leap to say that this is – this must be the gear that the whale encountered and became entangled in. We don't really know that.)

[418] Day 7 Trial Tr. 125:1–127:3.

[419] *See supra* Section III.F.4.

[420] Day 4 Trial Tr. 91:14–92:12.

[421] Ex. 1122 at 320.

[422] *See* Ex. 3003; Day 9 Trial Tr. 126:11–127:22; *see also supra* ¶¶ 153–56.

72%."[423]

228. This statement (i.e., adoption of 1,700-lb breaking strength rope could reduce life-threatening entanglements to large whales by 72%) is often relied upon by state and federal authorities in fashioning conservation measures.[424]

229. At trial, however, Ms. Knowlton acknowledged that this calculation was not based on the regression results she had reached, nor was it even a statement about the causal relationship between rope strength and injury.[425] Instead, it was a mathematical calculation that simply counted the number of times different estimated rope strengths *were found* on large whales.[426]

230. The 72% conclusion counts the number of known whales entangled in ropes with an estimated breaking strength greater than 1,700 lbs.[427] (Unlike the regression analysis, here the authors choose to use estimated rather than new strength, despite the admitted uncertainties doing so yields). Of the ropes found on the right whales and humpbacks and considered in the study, 28% were found to have an estimated breaking strength of 1,700 lbs or less, while 72% were found to have an estimated rope strength of 1,700 lbs or greater.[428] The 72% figure does not represent a comparison of the severity of the injuries to the whales or any other statistical calculation; it is just the percentage of whales *found* in ropes with an estimated breaking strength greater than 1,700 lbs. Ms. Knowlton conceded this:

> Q. Right. But my point simply is the 72 percent number which

[423] Ex. 1122 at 318.

[424] *See, e.g.*, Ex. 671 at 9-10; Ex. 1030 at 2-40; *supra* ¶¶ 187, 211.

[425] Day 7 Trial Tr. 172:2-173:20.

[426] *Id.* at 173:2-173:8.

[427] *Id.* at 172:2-173:20.

[428] Day 9 Trial Tr. 172:18–173:1.

> you've just confirmed is simply a percentage of the right whale and humpback whales that were found with estimated rope strength . . . at or greater than 1,700, that that's not a comparison to the severity of the injury at all, correct?
>
> A. Correct.[429]

231. It is therefore misleading to state that "broad adoption of ropes with breaking strengths of . . . 1,700 lbsf . . . could reduce the number of life-threatening entanglements for large whales by at least 72%." That is a causal statement (unfortunately but frequently relied upon as such), i.e., it incorrectly suggests that if one changes the strength of the rope to 1,700 lbs, then that will cause a reduction of life-threatening entanglements.

232. No such causal conclusion was in fact reached in the study, and the 72% figure is merely a tally of ropes found on large whales.[430]

233. Even Ms. Knowlton conceded that a 1,700-lb breaking strength rope would "continue to be a source of morbidity."[431]

**c. Knowlton's evidence does not show a defined relationship between gear type and whale health; all vertical gear types can cause injury.**

234. Ms. Knowlton offered charts and testimony to suggest that only serious and moderate entanglements result in a change of health status to right whales.[432]

235. In her report, Ms. Knowlton compares health scores for different demographic groups depending on entanglement severity. Figure 5 shows the deviation of health scores from

---

[429] *Id.* at 173:9–20.

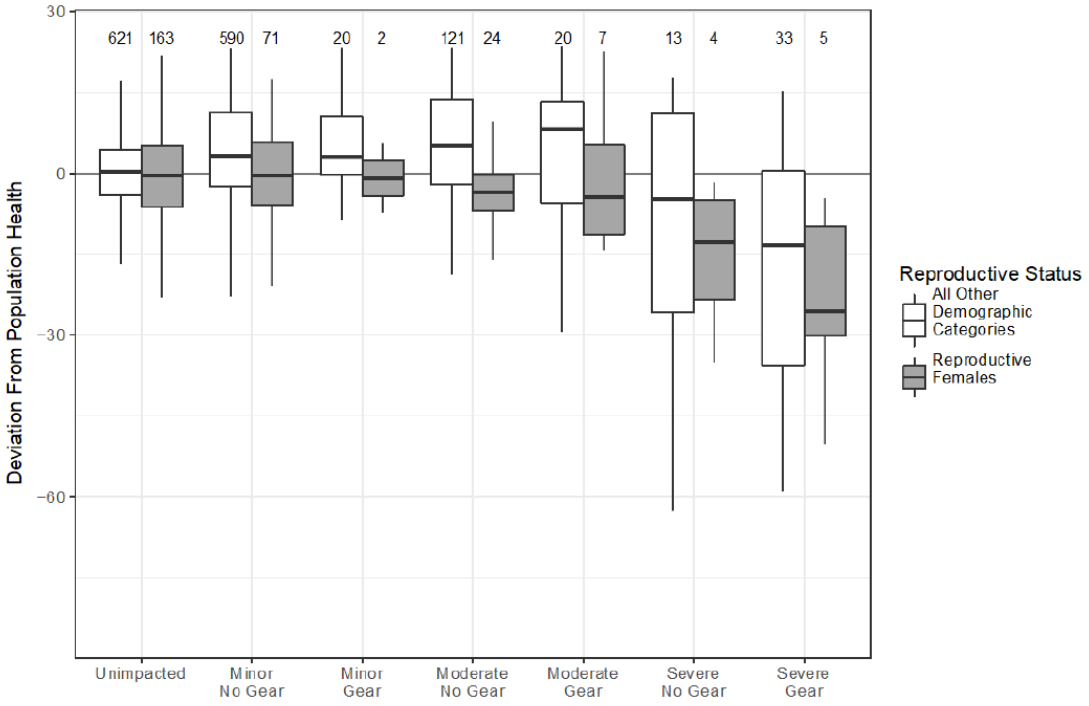
[430] The only way the statement could be true is if *one assumed* that 100% of the time that larges whales are entangled in rope of 1,700-lb breaking strength or less they never are seriously injured or killed. But since Ms. Knowlton's data shows that to be untrue, the assumption is untrue.

[431] Day 7 Trial Tr. 127:24–128:6; *see also* Ex. 582 fig. 5.

[432] Day 6 Trial Tr. 136:10-21.

the baseline health of the North Atlantic right whale population depending on levels of entanglement severity:[433]

Figure 5. Comparison of health scores and their deviation from population health between different levels of entanglement severity and demographic groupings. Knowlton et al. In progress




236. In this figure, the lines above and below the white box show "the maximum and minimum health scores for that grouping of individuals" and the numbers above those lines represent the population size studied (i.e., for moderate gear, the graphic represents 7 reproductive females, and the 20 non-reproductive North Atlantic right whales).[434] Any box below the 0 line represents a worsening of health and any box above that line represents an improvement.[435]

237. The data presented in Figure 5 has not yet been published or peer reviewed and

[433] Ex. 582 fig. 5; *see* Day 7 Trial Tr. 43:1–7.

[434] *Id.* at 43:13–44:2.

[435] *Id.* at 44:3–11.

was presented without any analysis of its statistical significance.[436]

238. Ms. Knowlton also admitted that her health scores did not take into consideration several sublethal harms, such as changes in body mass, decreased reproductive ability, changes in feeding behavior and habits, or whether a whale was already compromised by other rope entanglements.[437]

239. According to Ms. Knowlton's data, for the 20 non-reproductive whales with moderate injuries and where gear was present, their health showed an *improvement* over the overall health of the population.[438] The same is true for whales with minor injuries, both with gear present and no gear present.[439] Ms. Knowlton speculated that this might be related to reports she was aware of in the literature that for other animal species, a short-term stress "can almost benefit them because they're just more aware of their environment."[440] But she agreed that because she has not yet analyzed the statistical significance of this data, "we should not reach any conclusions on the basis of this data at this time."[441] Ms. Knowlton said that she provided this data just to show that there is a "pattern that severe cases are definitely reducing" right whales' health, but agreed "beyond that, we shouldn't take anything else out of it."[442]

240. Ms. Knowlton's effort to suggest that only serious entanglements result in a change

---

[436] *Id.* at 42:18–25.

[437] *Id.* at 40:18–41:7, 125:12–18.

[438] Ex. 582 fig. 5.

[439] Day 7 Trial Tr. 44:12–46:3.

[440] *Id.* at 44:12–46:3.

[441] *Id.* at 46:4–14.

[442] *Id.*

of health status to right whales is also contradicted by a 2015 paper she co-authored titled *Apparent Survival of North Atlantic Right Whales After Entanglement in Fishing Gear*, which stated that "[o]ur results indicate that both juveniles and adult North Atlantic right whales have a lower probability of survival after a reported entanglement. Multistate models estimated the apparent survival of entangled adults to be 23 percent lower than other adult females and 26 percent lower than other adult males."[443]

241. Given all of this, there is no basis to conclude that only serious entanglements result in a change of health status to right whales.

**d. Entanglement severity depends on entanglement configuration and rope friction—not just rope break strength.**

242. The Knowlton study did not address sublethal harms that North Atlantic right whales experience when they become entangled, beyond acknowledging that using weaker ropes would not reduce the number of interactions between whales and gear.[444]

243. Friction between a rope and a whale's skin contributes to the severity of an entanglement injury.[445] 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, so "[i]n fact, the skinnier ropes cut in more than the fatter ropes do."[446]

---

[443] *Id.* at 47:19–49:2.

[444] Ex. 1122 at 326.

[445] *See* Day 9 Trial Tr. 92:11–94:2 (comparing friction's role in an entanglement to a dock cleat, where one wrap of rope around a cleat will allow the rope to slide back and forth, but with additional wraps friction will hold the rope, and thus the boat, in place.).

[446] *Id.* at 96:15–97:6.

244. 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."[447] These injuries can cause the whale flippers and flukes to "completely necrose and devitalize."[448]

245. Figure 18 from a 2019 paper authored by Dr. Sharp depicts a chronic entanglement where a vertical buoy line wrapped around the flipper and embedded in the lip of a North Atlantic right whale[449]:

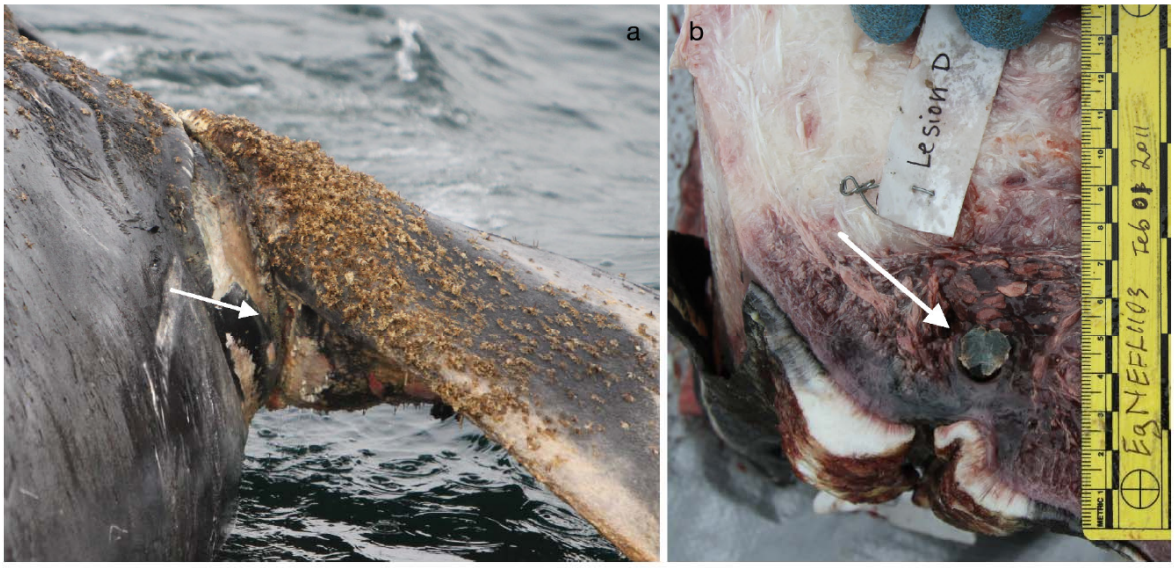



Fig. 18. North Atlantic right whale (EgNEFL1103 / 3911; see Table 4); cause of death: confirmed chronic entanglement. (a) View of right axilla from the caudal perspective showing extensive orange cyamid coverage on the affected flipper. The embedded entangling line can be seen at the arrow. (b) Right lateral lip in cross-section showing embedded line (arrow) and surrounding hemorrhagic edema. Image credits: Florida Fish and Wildlife Conservation Commission

246. When asked how the strength of the rope entangling the whale in this figure would impact the severity of the injury shown in the photo, Dr. Sharp responded, "a low breaking

[447] *Id.* at 54:15–55:21.

[448] *Id.*

[449] Ex. 422 at 17 fig. 18.

strength line would not act much differently than a high breaking strength line in this specific instance."[450] She explained that "this whale's body is responding to . . . a foreign body that's been embedded into the tissue. So any kind of foreign body, the body is going to respond like this no matter the size or the strength of it, per se," emphasizing that a constricting wrap "is going to cause tremendous damage . . . no matter the breaking strength of it."[451]

247. Dr. Sharp similarly testified that the rope's diameter would not impact the injury's severity because "it's essentially a foreign object that is embedded into that tissue. It's like a dog chewing on a stick. . . . A piece of the stick gets embedded. That tissue is going to have a response to that. It doesn't really matter the size of the piece of stick that gets embedded and lodged down in the dog's neck. . . . [T]he body is still going to . . . try to reject that foreign [] object . . . ."[452]

248. Dr. Sharp testified about another entanglement in which the mere presence of the line, not its strength or diameter, caused the damage to the whale.[453] Dr. Sharp pointed to a figure from the whale's necropsy report depicting the humerus with a deep furrow and a fibroproliferative bone growth (a cauliflower-like bone growth on either side of the entanglement where the bone tried in vain to repair itself around the line) caused by entangling rope.[454]

---

[450] Day 4 Trial Tr. 53:7–16.

[451] *Id.* at 53:18–54:3.

[452] *Id.* at 55:22–56:22.

[453] *Id.* at 56:25–57:14.

[454] Ex. 422 at 17 fig. 19.

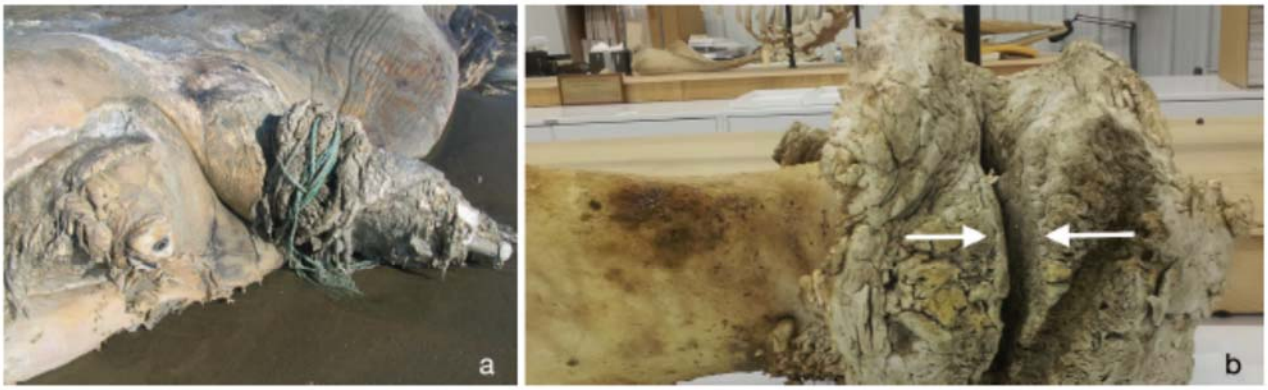



Fig. 19. North Atlantic right whale (SC1118; see Table 4); cause of death: probable chronic entanglement (entanglement confirmed, role in death is probable). (a) 13 wraps of entangling line were found around the right pectoral flipper. (b) Flensed humerus showing exuberant proliferative periosteal reaction (new bone formation) near the humeral head and a furrow caused by the chronically impinging line (arrows). Image credits: NOAA National Ocean Service Center for Coastal Environmental Health and Biomolecular Research Coastal Marine Mammal Strandings and Assessments Project

249. Dr. Moore described the rope dynamics that cause these cauliflower-like bone growths.

> [A rope with] greater draw length could potentially result in the rope pull migrating through the tissue until you come to a hard stop. And the hard stop is usually bone. So with a flipper entanglement, if it starts to saw back and forth—which it often does because the flipper is moving quite a bit—then that's where we see the cutting in very often. And when the rope finally, with all of its turns, gets to the bone, that's where the business really starts, because then the animal, it is fighting against itself because it's putting the flipper back and forth as it's trying to steer and so on and guide itself through the water. And what the rope does is, if there is any tension on it, it could slide through a little bit as the consistency of the tissue changes, and so it pulls everything tighter and tighter. So the constriction gets worse and worse. And then that is further aggravated by the tissue response from the animal, which involves—and the term—in case of bone, you get new cartilaginous. Cartilage forms. It kind of looks like cauliflower growing up like a little tumor around the rope and burying it to try and fixate it and do what we call classically a foreign body reaction. You can't get rid of it, so it's just an ongoing chronic tissue response that the animal's having to deal with.[455]

250. Dr. Sharp also spoke to the impact of rope strength and diameter on entanglements

[455] Day 9 Trial Tr. 108:25–110:5.

of whale baleen and blowholes. Figure 23a[456] shows rope found in the baleen plate of a North Atlantic right whale, creating gaps in the baleen plate such that the whale could not efficiently feed (Dr. Sharp explained that to eat, North Atlantic right whales need to capture tiny creatures called copepods inside of their baleen plates).[457] Figure 23b shows damage to the whale's blow hole, "potentially significantly impacting the animal's ability to breathe as well as its ability to have a watertight seal when it's diving."[458] Dr. Sharp reiterated that the entangling rope's break strength and diameter were irrelevant to the severity of the injury.[459]

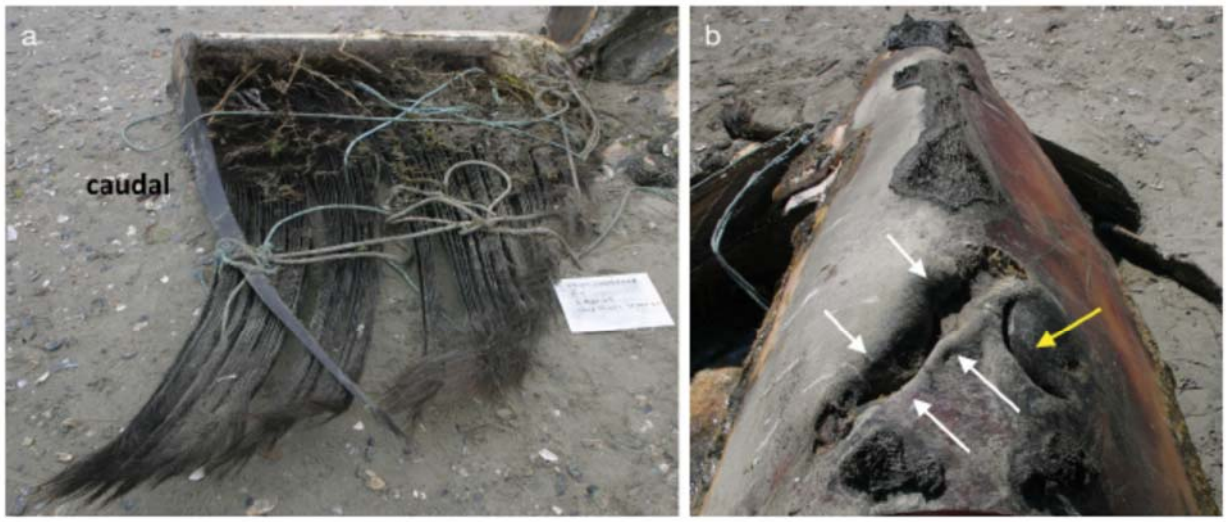



Fig. 23. North Atlantic right whale (VAQS20051008Eg / 2301; see Table 4); cause of death: confirmed chronic entanglement. (a) Anterior half of left baleen rack after gingiva was excised and baleen was reflected to reveal the medial aspect of the baleen and the entangling lines *in situ*. (b) Deeply abraded laceration (white arrows) directly over the left naris (blowhole) on the dorsal head of the same whale caused by the entangling line. Yellow arrow points to the unaffected right naris (blowhole). Photo credits: Virginia Aquarium & Marine Science Center

251. Ms. Knowlton acknowledged that there has been "some research that's been done,

[456] Ex. 422 at 19 fig. 23.

[457] Day 4 Trial Tr. 58:2–59:17.

[458] *Id.* at 58:2–22.

[459] *Id.* at 60:15–23 ("The diameter of the rope would not necessarily change the negative outcome on the animal if it's embedded like this."); *id.* at 59:18–3 ("Any line that can separate the baleen plates would have the same kind of detrimental effects).

not by ourselves, that thinner diameter ropes that are strong can cut into tissue more quickly than larger diameter ropes" and that might impact the severity of the injury to whales.[460]

252. Of the 43 cases in which entangling gear was retrieved and analyzed from NMFS's database of documented entanglements between 2000 and 2019, 12 (28%) were caused by rope with a diameter of 3/8" or less.[461] These entanglements include the 2016 entanglement of a right whale caused by Massachusetts-licensed gear[462] and a fatal entanglement.[463]

253. Ms. Knowlton further conceded that her paper did not consider or include any variables for configuration of the ropes on the whales, the duration the ropes were on the whales, the size of the animals (other than by age), or the diameter of the rope.[464]

254. The Commonwealth has conceded its new weak rope requirement will not reduce the occurrence of entanglements[465] and that only removing all vertical buoy lines can eliminate all entanglement risk.[466]

**e. The Commonwealth's weak rope requirements will not reduce the risk that vertical buoy lines pose to North Atlantic right whale calves.**

255. Dr. Sharp stated in her declaration that "[y]oung right whales are frequent visitors

---

[460] Day 7 Trial Tr. 56:14–57:1.

[461] *See* Ex. 1112 at rows 107, 109, 119, 148, 179, 239.

[462] Ex. 1112 at cell 239; *supra* ¶ 137 & n.243.

[463] In 2012, a right whale was found dead off Palm Coast, FL, entangled with 3/8" line. NMFS identified the gear based on ALWTRP markings as Northeast U.S. inshore lobster trap gear. Ex. 1112 at cell 179.

[464] Day 7 Trial Tr. 58:22–60:3.

[465] Day 6 Trial Tr. 68:12–21.

[466] *Id.* at 69:5–70:10 (Mr. Glenn agreeing that "[t]he risk of entanglement and injury/mortality due to fixed fishing gear in the closure is assumed to be zero," but "[t]he risk of entanglement and injury and mortality by allowing fishermen to fish with [weak links] . . . is greater than zero and as such cannot be deemed a conservation equivalent").

to Massachusetts waters and need to be protected by law; [reduced break strength rope] will simply not accomplish that."[467]

256. The Knowlton study concedes 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."[468]

257. Dr. Sharp testified that "neonates are thought to be not as strong as minke whales."[469]

258. All of the minke whales examined in the study "were found dead in the gear" and likely had been anchored (i.e., unable to break free from the gear)."[470]

**f. The way Massachusetts fishermen intend to comply with the Commonwealth's new weak rope requirement will undermine the regulation's intended impact.**

259. Massachusetts lobstermen can comply with the Commonwealth's new weak rope requirement in one of two ways. First, they can purchase rope that is uniformly weak in its strength.[471] Second, they can insert weak "sleeves" into the top 75% of the buoy line every 60 feet, in an attempt to weaken it.[472]

---

[467] Ex. 578 ¶ 15; *see also* Day 4 Trial Tr. 82:19–83:1; 94:3–15, 99:15–100:2; Ex. 578 ¶ 14.

[468] Ex. 1122 at 326.

[469] Day 4 Trial Tr. 94:9–15.

[470] Ex. 1122 at 323.

[471] Day 10 Trial Tr. 154:13-15.

[472] *See* 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.'"); Day 10 Trial Tr. 152:23–155:5.

260. Mr. McKiernan 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.[473]

261. The fishermen who testified at trial confirmed that they opted to meet the weak rope requirement by insert weak sleeves into their existing ropes rather than purchase new rope.[474]

262. As both Dr. Moore and Dr. Sharp explained, there is a significant difference between rope that is uniformly weak in its break strength and rope that has been effectively weakened through the interspersing of weak inserts every 60 feet of the first 75% of the line.[475]

263. Dr. Moore clarified that "if 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."[476] "The link has to be exposed to the stressor that it is designed to fail at. So if the weak link is buried in rope that's of a higher strength on either side of it, it's not going to do that."[477]

264. Dr. Sharp declared that "when whales become entangled, the entanglement configuration can inhibit their range of motion, which in turn can hinder their ability to generate

---

[473] Day 10 Trial Tr. 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.").

[474] *See, e.g.*, Day 8 Trial Tr. 45:10-15 (Mark Ring testifying that he "inserted the weak rope where I had to" and "did not have to replace all of my lines"); Day 10 Trial Tr. 46:1-2 (Eric Lorentzen testifying he used the weak inserts).

[475] *See infra* ¶¶ 263–266.

[476] Day 9 Trial Tr. 103:14–21.

[477] *Id.* at 104:11–25.

maximum force to break a line."[478]

265. Dr. Moore testified that he had seen this phenomenon—where the weak insert did not activate—on a humpback whale. "[A] humpback that was entangled last summer where there were wraps around the head, and there was a weak link clearly visible over the wraps of the head, but there was a rope by the side of it, and the weak link had done nothing."[479]

266. Dr. Moore opined that even where the entire rope is weak, it may still cause substantial damage to a North Atlantic right whale.[480] To make this point he referenced the lethal entanglement depicted in Figure 23 of Dr. Sharp's paper (which Dr. Moore co-authored) of North Atlantic right whale #2301.[481] As Dr. Moore explained, the ropes pulled off this whale at the time of its necropsy had an effective break strength ranging from 400 to 900 lbs—significantly lower than the effective break strength the Commonwealth now allows.[482]

**g. The Commonwealth's weak rope requirement is insufficient to prevent harm to North Atlantic rights whales in Massachusetts waters.**

267. Dr. Sharp testified that Commonwealth's new rope strength requirements would not decrease the risk of entanglement incidents, there would not be any appreciable change to likelihood of right whales exceeding the PBR for the species.[483]

268. Dr. Sharp testified that because the Commonwealth's new rope strength requirements would not decrease the incidence of entanglements, they will be insufficient to

[478] Ex. 578 ¶ 16.

[479] Day 9 Trial Tr. 103:22–104:10.

[480] *See id.* at 111:24–117:3.

[481] *See id.* at 111:24–117:3.

[482] *See id.*

[483] Day 4 Trial Tr. 106:24–108:6.

reduce the sublethal harm attendant to these entanglements.[484]

269. Both Dr. Moore and Dr. Sharp opined that the Commonwealth's current suite of measures is still insufficient to protect the North Atlantic right whale.[485]

270. Ms. Knowlton agreed that, "[u]ltimately, removal of rope from the water column will better enable species recovery."[486]

**4. The DMF's new regulations will not enable it to obtain a separate fishery designation for commercial trap/pot fishing in Massachusetts jurisdictional waters.**

271. To comply with the MMPA, NMFS annually publishes a list of commercial fisheries (or LOF) and classifies those fisheries based on their risk of interactions with marine mammals.[487] Category I fisheries are defined as those that cause "frequent incidental mortality and serious injury of marine mammals," Category II fisheries cause "occasional incidental mortality and serious injury of marine mammals," and Category III fisheries have "a remote likelihood of or no known incidental mortality or serious injury of marine mammals."[488]

272. The regulations provide quantitative methods to effectuate the classification: A Category I fishery is one where that fishery itself annually contributes 50% or more of the removal of any stock's potential biological removal.[489] A Category II fishery is one (a) where collectively with

---

[484] *Id.* at 100:4–21, 101:6–21, 102:22–102:10.

[485] Day 9 Trial Tr. 227:2–4 ("I do not necessarily believe [the Commonwealth's measures are] adequate."); Ex. 578 ¶ 18 ("Endangered species that frequent MA state waters, including the [right whale] simply cannot sustain the current fishery entanglement mortality and injury rates and the Motion's proposed mitigation measures would not be sufficient to reduce them.").

[486] Day 7 Trial Tr. 128:7–10.

[487] 16 U.S.C. § 1387(c)(1)(C).

[488] 16 U.S.C. § 1387(c)(1)(A).

[489] 50 C.F.R. § 229.2.

other fisheries annually contributes more than 10% of any marine mammal stock's potential biological removal level and (b) that is by itself responsible for the annual removal of between 1% and 50%, exclusive, of any stock's potential biological removal level."[490]

273. The list of commercial fisheries (LOF) was first required in the transitional rules under 16 U.S.C. § 1383a(b)(1). From 1994 onward, the annual LOF is of "necessary changes" to the original list.[491]

274. The MMPA defines the term "fishery" to mean: "(A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks."[492] This definition is imported from the Magnuson Stevens Fishery Conservation and Management Act (MSA).[493] There, the same words are used: "fishery" means "(A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks."[494]

275. Since at least 1997, and for the purpose of the annual MMPA classification, the American Lobster Fishery has been treated as a single fishery classified as Category I.[495] Driving

---

[490] *Id.*

[491] 16 U.S.C. § 1387(c)(1).

[492] 16 U.S.C. § 1362(16).

[493] 50 C.F.R. § 229.2 ("Fishery has the same meaning as in section 3 of the Magnuson Fishery Conservation and Management Act . . . .").

[494] 16 U.S.C. § 1802(13).

[495] 62 Fed. Reg. 33, 45-46 (Jan. 2, 1997); *see* Appendix § C.

that classification is its impact on the North Atlantic right whale.[496] The singular designation makes sense: the gear used throughout the fishery has common features that cause the fishery's removal of right whale stock (vertical buoyed end lines, traps, trawl lines, etc.).

276. Similarly, for decades, state and federal lobster managers have treated the American Lobster fishery as a single fishery.[497] The stock of American lobsters up and down the East Coast and adjacent federal waters has been treated as a single unit for the purposes of conservation and management of lobsters since the first American Lobster management plan.[498]

**a. The Commonwealth has failed to obtain a separate classification for its lobster fishery in state waters.**

277. In October 2020, the Commonwealth asked NMFS to reclassify lobster trap/pot fishing in Massachusetts state waters as its own non-Category I fishery, separate from the broader Category I American Lobster fishery.[499] The Commonwealth argued it had implemented gear restrictions and other actions that distinguished trap/pot fishing in Massachusetts waters from lobster fishing elsewhere.[500]

278. DMF employee Robert Glenn, explaining the Commonwealth's application for reclassification, stated "in the process of trying to seek an incidental take permit, . . . we were made aware by National Marine Fisheries Service that as being part of the larger fishery, the Northeast/Mid-Atlantic trap/pot fishery for lobster, that because we were only a small portion of it, we couldn't possibly achieve an incidental take permit within those confines . . . because we

[496] 61 Fed. Reg. 37,035, 37,038 (July 16, 1996); 62 Fed. Reg. 33, 36, 38 (Jan. 2, 1997).

[497] *See* Ex. 2002; *see, e.g.*, 62 Fed. Reg. 33, 45 (Jan. 2, 1997).

[498] *See* Ex. 2002.

[499] Ex. 116 at 3037-38; Day 6 Trial Tr. 9:23–10:22.

[500] Ex. 116 at 3037-38; Day 6 Trial Tr. 9:25-10:8.

only are part of a – one small part of that fishery."[501]

279. NMFS denied DMF's request.[502] NMFS observed "the current implemented measures *are not enough* to suggest Massachusetts's state waters lobster trap/pot fishery should be split" and directed the Commonwealth to NMFS's denial of a similar request from the state of Maine.[503] This denial provided details "on how gear would be considered unique to differentiate it from other state lobster and trap/pot fisheries."[504] Ultimately, NMFS explained that should "major changes to lobster gear and fishing practices be required and implemented for all Massachusetts state lobster fishing gear, making this gear unique and easily identified from other state and Federal gear, NMFS will re-evaluate the status of this fishery . . . ."[505]

**b. Other states have failed to obtain separate classifications of their lobster fisheries.**

280. For each of the last three LOF processes, Maine has requested a separate designation for Maine state waters, distinct from the broader American Lobster fishery. NMFS has denied each of these requests.

281. In 2019, the Maine Lobstermen's Association (MLA) asked NMFS to reclassify the Maine lobster fishery as a stand-alone fishery.[506] The MLA argued: (1) that of the many individual serious injury and mortality cases from 2012 to 2016 to right whales, the gear in most cases could not be attributed to a particular fishery or country, and, in some cases, no gear was present at all;

---

[501] Day 6 Trial Tr. 10:10–22.

[502] Ex. 116 at 3,038; Day 6 Trial Tr. 10:23–11:2.

[503] Ex. 116 at 3,038.

[504] Ex. 116 at 3,038.

[505] *Id.* at 3,037–38.

[506] 84 Fed. Reg. 22,051, 22,059 (June 17, 2019).

(2) that confirmed entanglements in Maine gear was rare; and (3) that changed migratory patterns and lack of data on interactions warranted separate treatment.[507]

282. NMFS denied the request in the 2019 LOF, writing:

> Entanglement in trap/pot gear is one of the largest threats that North Atlantic large whales face and attributing gear from entanglement events to a specific fishery and geographic location is difficult. The long distances the whales travel and transport gear before being sighted; rarity of actually sighting an entangled whale compared to the estimated entanglement rates; lack of adequate observer coverage on trap/pot fisheries, particularly state trap/pot fisheries; challenges in recovering gear if a whale is disentangled; and low likelihood that recovered gear is marked with an adequate location identifier all complicate our ability to identify discrete locations where entanglements occur.[508]

283. NMFS reasoned that given the difficulty of pinpointing where an entanglement first occurred, treating the American Lobster Fishery as one unit is the better practice.[509] It also observed that "gear marking strategy has been continually updated over the past two decades . . . [but] despite the current gear marking requirements, recovering gear entangling whales that possesses gear marks has remained low."[510] It further noted that "if Maine state and Federal fisheries implement gear modifications to eliminate risk to large whales, such as vertical lineless technologies, we would evaluate that fishing gear according to the level of risk posed to marine mammals especially if it that risk is different from traditional fishing gear."[511]

284. The next year, NMFS denied a similar request when publishing the 2020 LOF,

---

[507] *Id.*

[508] *Id.*

[509] *See id* (discussing difficulties of pinpointing entanglements to a specific area of the fishery).

[510] *Id.*

[511] *Id.*

stating there was insufficient information "for splitting the Northeast/Mid-Atlantic American lobster trap/pot into multiple fisheries."[512] NMFS noted,

> Fisheries are categorized based on the gear types used, how the gear is fished, and the behavior of the fishery related to the risk to marine mammals. Multiple states participate in the American lobster trap/pot fisheries, using a wide variety of gear and gear configurations throughout a large portion of coastal waters. While we recognize this variety within the fishery at large, there are no clear boundaries to divide gear use across the wider area, as suggested by this comment. Importantly, the state of Maine does not use unique gear configurations, compared to gear configurations used in other states . . . .[513]

285. Later in 2020, the MLA, again, requested NMFS treat Maine's state and federal water lobster fisheries as unique fisheries, separate from the American Lobster fishery.[514] It argued: (1) that NMFS has the flexibility to consider a variety of criteria (e.g., differences in gear and fishing techniques, distribution of endangered stocks) when classifying fisheries on the LOF; (2) that while lobstering effort is coordinated among the states and federal authorities, the state of Maine manages and enforces the Maine state lobster fishery; and (3) that Maine has special restrictions on the extent/locations of fishing allowed.[515] The MLA also argued that treating the American Lobster fishery as a whole did not accurately reflect relative risks within the fishery itself; that differences in fishing techniques, gear used, seasons and areas fished, fishermen's observations of right whales and distribution of marine mammals leads to the conclusion that the lobster fishery prosecuted close to shore in Maine is significantly different than some other lobster fisheries; that

[512] 85 Fed. Reg. 21,079, 21,085–86 (May 18, 2020).

[513] *Id.* at 21,086.

[514] Ex. 116 at 3035.

[515] *Id.*

documented mortality or serious injury to the North Atlantic right whales in Maine waters is non-existent; and that the last documented entanglement in Maine-licensed gear was in 2002.[516]

286. NMFS denied the request.[517] While NMFS agreed it "has the flexibility to separate out individual fisheries where it is appropriate," it concluded there was insufficient information "to substantiate any difference in risk that Maine state and Federal lobster fisheries pose to North Atlantic right whales, or other large whale species, that would warrant a current change in classification for these fisheries."[518] It again observed that "NMFS must look at the risk that the gear itself poses to large whales, particularly North Atlantic right whales" and that "current Maine state lobster management does not represent unique gear characteristics (e.g., the use of weak rope exclusively or exclusion of vertical lines)."[519]

**c. Other facts show the Commonwealth will fail to obtain a separate classification for its lobster fishery in state waters.**

287. At the time that DMF sought separate classification for Massachusetts waters in the fall of 2020, the proposed regulations argued to NMFS for that designation had more aggressive proposals than those ultimately approved (e.g., closure of *all* state waters for the closure period; a ban on singles).[520] Nevertheless, NMFS denied the state the designation.[521]

288. Meanwhile, NMFS has been proceeding with regulations for federal waters that will enact measures similar to those of Massachusetts (e.g., use of 1,700-lb breaking strength rope; a

---

[516] *Id.*

[517] *Id.*

[518] *Id.*

[519] *Id.*

[520] *Id.* at 3037–38.

[521] *Id.* at 3038.

periodic closure).[522] In short, by the time of the next separate designation request, Massachusetts regulations will be even less distinct from other portions of the American Lobster fishery than they were at the time NMFS last rejected the request.

**5. DMF's new regulations do not establish a risk reduction below PBR.**

**a. NMFS estimates that the federal fisheries will continue to cause an average of 2.69 SI/M per year for the foreseeable future.**

289. NMFS anticipates that there will be—in the U.S. federal fisheries alone—an annual average of 2.69 SI/M during Phase 1, 2.61 during Phase 2, and lower numbers based on unspecified plans thereafter.[523] PBR for the North Atlantic right whale is currently 0.8.[524]

290. Given the length of each phase, NMFS anticipates a total of 8.07 SI/M in Phase 1, and 5.22 in Phase 2 due to U.S. federal fixed-gear fisheries alone.[525]

291. Based on its calculations, NMFS estimates that 18.49 right whales will die or be seriously injured in the ten years before the framework is fully implemented.[526]

292. NMFS admits that during the first ten years of its proposed action, the federal fisheries will likely cause sublethal harm that will continue to decrease the North Atlantic right whale's calving rate, but it provides no estimates of the consequences to the species (including its calving rate) because, it says, it cannot at this time estimate it.[527]

---

[522] *See supra* ¶ 187.

[523] Ex. 671 at 325–26.

[524] Ex. 104 at 22; *see also* Ex. 1030 at 2-40.

[525] Ex. 671 at 326.

[526] *Id.*

[527] *Id.* at 337.

**b. NMFS estimates that the state fisheries will continue to cause an average of 0.61 SI/M per year for the foreseeable future.**

293. To obtain an ITP, the Commonwealth must show that its fishery has a negligible impact on ESA-listed species.[528]

294. Although the BiOp's conclusions pertain to the federal fisheries only, the BiOp predicts that implementation of the ALWTRP proposed rule change will reduce the current number of entanglement-caused SI/M in *state* fisheries to North Atlantic right whales by 2.39 whales, resulting in an estimated annual average of 0.61 SI/M.[529] PBR for the entire species from all anthropogenic causes is currently 0.8.[530] In other words, the 2021 BiOp estimates that trap/pot fishing in state waters alone will—*even with implementation of new regulatory changes*—contribute to three fourths of the annual right whale PBR (leaving all other sources of impacts from U.S. and Canadian activities for the balance).

**(1) The 2021 BiOp does not quantify risk reduction of DMF's new regulations.**

295. The 2021 BiOp does not quantify the risk reduction associated with DMF's 2021 regulations (other than implicitly finding that it, along with other state fisheries, it will contribute 2/3 of the annual PBR and that those other contributions will far exceed PBR).[531] Although NMFS agreed that Massachusetts' new regulations were likely to reduce entanglement risk, it stated that "the level of risk reduction is not calculable at this time."[532]

---

[528] Day 6 Trial Tr. 73:8–74:9.

[529] Ex. 671 at 226, 321, 326, 333.

[530] Ex. 104 at 22; *see also* Ex. 1030 at 2-40.

[531] Ex. 671 at 326.

[532] Ex. 1030 at 3-76; *see also* Ex. 671 at 177–78; 322 Mass. Code Regs. § 12.00 (setting forth new regulations).

296. Regarding DMF's new requirement that vertical buoy lines be no thicker than 3/8", NMFS said this measure "will likely reduce the strength of line used by Massachusetts fishermen but it is unclear how this will relate to the maximum breaking strength requirements of 1,700 lbs. Maximum breaking strength is associated with line diameter but also with line material, so the risk reduction of a maximum line diameter alone is difficult to calculate without additional information on line material."[533]

297. Most vertical buoy lines fished in Massachusetts state waters are already 5/16" or 3/8" line.[534] North Atlantic right whales have been regularly entangled, including fatally, in rope of diameter 3/8" or less.[535]

**(2) The 2021 DST runs that NMFS generated for DMF did not solely assess the risk reduction associated with the Commonwealth's 2021 regulations.**

298. In May 2021, DMF requested that NMFS use its DST to access the risk reduction of its new regulations.[536] DST risk assessments do not distinguish between risk reductions achieved through regulations already in place, such as the seasonal closure of Cape Cod Bay that began in 2015, and newly enacted measures.[537] Therefore, the new DST runs that DMF requested in May calculate the risk reduction attenuate to *all* DMF measures—not just the 2021 measures. Unsurprisingly, the months for which the DST calculated the greatest reduction in risk are the

[533] Ex. 1030 at 3-76.

[534] Day 5 Trial Tr. 112:19–113:19.

[535] *See supra* ¶ 140.

[536] *See* Day 7 Trial Tr. 93:14–20; Ex. 1169; Ex. 1171.

[537] Day 7 Trial Tr. 106:3–21, 111:16–20.

months Cape Cod Bay is closed to lobster fishing.[538]

299. Furthermore, DST risk assessments can only be generated in month-long increments.[539] Thus, the 2021 DST runs assume the seasonal closure period includes the entire month of May,[540] though DMF has never extended the closure period past May 15.[541]

300. The relative risk scores the DST generates are given in the form of lower and upper bounds, which can differ dramatically.[542] For example, in the May 2021 DST runs, the "Final Relative Risk Score" for the month of December has a lower bound of 6.4%[543] and an upper bound of 73.9%,[544] with a 95% confidence interval.[545] Put another way, the DST can say with 95% certainty that the risk reduction is somewhere between 6.4% and 73.9% for the month of December.[546]

301. As the number of right whales have increased in Cape Cod Bay in the spring, the risk reduction value of the existing closure has increased.[547]

---

[538] Day 7 Trial Tr. 111:9–20. NMFS has calculated the extent to which the Commonwealth's recently enacted regulations have resulted in changes in relative risk scores, but not recently. *Id.* at 106:3–107:1.

[539] *Id.* at 109:8–25.

[540] *Id.* at 109:10–25.

[541] Day 2 Trial Tr. 21:3–8.

[542] Day 7 Trial Tr. 111:1–4.

[543] Ex. 1169 at CW092000.

[544] *Id.* at CW092001.

[545] Day 7 Trial Tr. 110:6–111:4.

[546] *Id.* at 110:6–111:8; Ex. 1169 at CW092000–01.

[547] Day 7 Trial Tr. 108:20–109:3 ("If the abundance of whales in Cape Cod Bay was going up, then the value of the closures would also increase and you would get a higher risk reduction.").

**K. The economic and cultural impacts the Commonwealth claims will result from removing VBRs from Massachusetts waters.**

302. Commonwealth expert Robert Griffin, a professor in the School of Marine Science and Technology at the University of Massachusetts Dartmouth,[548] opined that the closure of the Massachusetts lobster fishery would cause an annual loss of approximately $16 million in net revenue.[549]

303. Professor Griffin's opinions were premised on the assumption that prohibiting the use of VBRs would result in a complete closure of the Massachusetts commercial lobster fishery, with no commercial lobstering allowed in state waters under any conditions.[550] He examined only the immediate short-term economic consequences of such a closure and admitted that "[t]he further away we get from the current period, the less representative" his loss estimate would be.[551]

304. In formulating his opinions, Professor Griffin did not consider any economic impacts related to recreational lobster fishing,[552] what proportion of fishers' incomes is derived from lobstering versus other types of fishing,[553] or the economic effect of the Commonwealth's requiring ropeless technology instead of fishing with VBRs.[554] He did not factor any offsetting benefits into his analysis—e.g., reducing the financial cost (or loss of human life) associated with disentanglement programs—that would accrue to the Commonwealth were it to prohibit the use of

[548] Day 8 Trial Tr. 91:25–92:4.

[549] *Id.* at 98:13–21.

[550] *Id.* at 112:13–21.

[551] *Id.* at 113:9–21.

[552] *Id.* at 112:22–113:4.

[553] *Id.* at 114:19–115:4.

[554] *Id.* at 115:5–9.

VBRs.[555]

305. Although the primary focus of Professor Griffin's academic research involves developing methodologies to quantify the value of nature (such as the intrinsic value of preserving wildlife) for use in cost-benefit analyses, he did not develop any such methodology for this case.[556]

306. The Commonwealth's own (if limited) data on the economic impact of a closure of the lobster fishery sharply contrasts Professor Griffin's findings. DMF undertook an analysis of the economic effect of the 2015 closure on lobster fishers and found that aggregate revenues were not negatively affected, annual gross revenues were reduced by only 1.6%, and commercial landings did not decline.[557]

307. Based on the evidence at trial, there is no credible basis on which the Court can conclude that prohibiting the use of VBRs in Massachusetts waters would cause any significant aggregate economic loss, let alone a loss of the scope suggested by Professor Griffin.

308. Commonwealth expert Seth Macinko, a professor in the Department of Marine Affairs at the University of Rhode Island,[558] opined that Massachusetts commercial lobster fishers possess unique characteristics, such as individualism, competitiveness, self-reliance, and risk-taking, that make them particularly resistant to changing occupations and poorly suited to adapt to other occupational environments.[559] He testified that, because of these characteristics, closure of the

---

[555] *Id.* at 115:10–22.

[556] *Id.* at 110:22–112:12.

[557] Day 2 Trial Tr. 62:4–24; Day 6 Trial Tr. 44:20–46:21, 49:4–11. This analysis was never finalized because of a conflict between DMF and fishers regarding the calculation of loss. Day 6 Trial Tr. 45:15–46:11.

[558] Day 8 Trial Tr. 119:3–14, 137:11–19.

[559] *Id.* at 138:15–139:2, 141:13–144:6.

Massachusetts lobster fishery would result in myriad, non-quantifiable personal losses to individual fishers.[560] He also opined that closure of the fishery would cause broader losses to the character and culture of the fishing community, converting it to a "maritime museum" nostalgic for the past.[561]

309. Professor Macinko premised his opinions on the assumption that prohibiting the use of VBRs would mean a complete closure of the Massachusetts lobster fishery.[562] He did not consider, for example, that many Massachusetts lobster fishers are licensed to fish in both state and federal waters or may have alternative sources of income, or the possibility that Massachusetts could require them to use ropeless fishing technology in lieu of VBRs, nor did he address impacts of a closure on recreational fishers.[563] Professor Macinko further acknowledged that he had "assiduously avoided" considering the importance of conserving critically endangered marine species in formulating his opinions and that he was unaware of and took no position on the merits of the case.[564]

310. On cross-examination, Professor Macinko acknowledged that he has never authored a paper published in a peer-reviewed journal, designed a study on, or given a presentation primarily on the topic of the occupational culture of fishers.[565] He admitted that, of the six sources cited in his expert report in support of his opinion that the distinctive

---

[560] *Id.* at 144:15–145:24, 151:13–25.

[561] *Id.* at 146:1–151:14, 152:2–9.

[562] *Id.* at 171:12–22.

[563] *Id.* at 171:23–172:18.

[564] *Id.* at 172:20–173:3.

[565] *Id.* at 155:20–156:21.

characteristics of commercial fishers make them ill-suited for employment in other professions, only one examined the occupational culture of New England fisheries.[566] He was aware of no studies on the occupational culture of lobster fisheries generally or the Massachusetts lobster fishery specifically.[567]

311. Confronted with the cited papers' findings that there were significant variations in various measures of job satisfaction across different ports and among different types of fishers (including one finding that inshore lobstermen specifically had the lowest level of job satisfaction of all subgroups on one factor), Professor Macinko admitted that fisher job satisfaction is complex and multivariate and that one should be careful about generalizing any aspect of the findings in the literature.[568]

312. Professor Macinko also opined that closure of the fishery would cause broader losses to the character and culture of the fishing community, converting it to a "maritime museum"—an opinion he conceded was "harder to substantiate."[569]

313. But the references Professor Macinko relied on to support this argument actually herald New England's ability to change its regional identity in response to social, economic, and political change, including its evolution from a region "at the forefront of fishing, shipping, shipbuilding, and maritime preservation" to one "leading the crusade to save our seas."[570]

314. Accordingly, the Court should not credit the opinions of Professor Macinko.

---

[566] *Id.* at 157:16–160:13.

[567] *Id.* at 168:12–25.

[568] *Id.* at 161:17–163:24, 165:19–166:19, 167:3–168:1.

[569] *Id.* at 145:25–151:12, 152:1–8.

[570] *Id.* at 145:25–146:12, 169:1–171:11.

**L. Ropeless fishing is technically feasible and will prevent harm to North Atlantic right whales and sea turtles.**

315. Both Dr. Moore and Mr. Glenn testified that the technology for ropeless fishing is very well developed. Dr. Moore explained that two different ropeless technologies—one manufactured by EdgeTech and the other by Smelts—are fully functional in terms of retrieval and ready to be fished by trained operators in the commercial fishing industry.[571] Mr. Glenn conceded that this "technology has been around for [a]n excess of 20 years."[572]

316. These systems are remotely activated—an acoustic signal is sent to the trap and then the trap either releases a line that can be used to haul it to the surface or a bag inflates that pops the trap up to the surface.[573] No grappling is needed to haul traps to the surface.[574]

317. Mr. Glenn explained that the primary issue confronting ropeless technology is a question of gear conflict. Multiple different types of fishers, including scallop dredgers, codfish dredgers, and lobster fishers, exist in Massachusetts waters.[575] Currently, buoys attached to lobster traps signal to fishermen who dredge ground fish that lobster traps are present in a given area. DMF is concerned that without these buoys, a "gear conflict" between lobster fishermen and dredger would occur.[576]

318. One way around this issue would be an electronic gear marking system where fisherman could mark where they have dropped their traps on an electronic map (much like

[571] Day 9 Trial Tr. 150:12–151:21, 154:7–20.

[572] Day 5 Trial Tr. 108:8–110:24.

[573] Day 10 Trial Tr. 141:5–11; Day 5 Trial Tr. 108:24–110:24.

[574] Day 10 Trial Tr. 141:12–15.

[575] *Id.* at 128:6-22.

[576] Day 5 Trial Tr. 108:24–110:24.

dropping a pin on google maps).[577] As Eric Lorentzen and Mr. McKiernan explained, fishers have advance mapping technology available on their shipping vessels.[578] This technology includes radios, sonar, GPS, safety satellite transmission, and radar.[579] Radar technology, for example, can show where the shoreline is, where other vessels are, and where buoys are located.[580]

319. Finding successful solutions to gear conflict questions is not foreign territory for DMF: DMF currently solves a variety of gear conflict questions by sectioning off pieces of its waters to certain fisheries at certain times of the year. As Mr. McKiernan explained, "[w]e have many time-area closures to various gears. So, for example, between the shoreline and 3 miles is closed to mobile gear from . . . Boston all the way to Provincetown. That rule goes back to the 1930s . . . . We also have a closure to lobster gear in the middle of Cape Cod Bay off Provincetown for a couple of months, because we . . . try to achieve a sharing arrangement between lobstermen and dragging, and they didn't get along. So we kicked the lobstermen out and we let the draggers fish there for a couple of months."[581] Mr. McKiernan also noted that there "are other conservation closures that are basically based on lat/long and the regulations. And fishermen who use certain gears would need to stay out of that. But if you weren't using that kind of gear, you could go in there."[582]

---

[577] *See* Day 11 Trial Tr. 51:17–52:2 ("The consortium's vision of a ropeless future includes the establishment of a master database where all gear locations are stored together and regularly updated. This level of technology is analogous to the geo-spatial positioning features of our smartphones, but would instead be specific to fixed gear in the region.").

[578] Day 10 Trial Tr. 50:9–22; Day 11 Trial Tr. 46:14–47:14.

[579] Day 11 Trial Tr. 46:14–47:14.

[580] *Id.* at 46:25–47:5.

[581] *Id.* at 47:21-48:14.

[582] *Id.* at 47:21-48:14.

320. When asked how fishers ascertain the boundaries of the relevant gear conflict regulations, Mr. McKiernan explained that fishers can use their existing GPS systems to plot the boundary of the regulations: "[T]hey can record or enter those coordinates into their own electronics, their GPS, to know if they're on the right side of the line."[583]

> Q. And it'll be shaded in some way, and there will be a picture of their boat on their screen so they can know where they are in relationship to it. Is that fair to say?
>
> A. Yes, that's right.
>
> Q. And how common is it for commercial fishers to be equipped to be able to know like that where they are in the water?
>
> A. I would say nearly all of the professional fishermen, you know, those who are doing it for a living, would – would have that or even those who are the higher-end part-timers who have enough money to do it. So it's really common.
>
> Q. All right. Even for recreational boaters, there's an expectation that those boaters at times need to know where they are on the water in relationship to a line. So as an example, is there, in Cape Cod Bay, a speed limit that even applies to recreational boaters at certain times of the year?
>
> A. Yes, during the right whale season.
>
> Q. Right. And even recreational boaters are supposed to know where they are in terms of where that line is drawn on the water, between where – how fast they're allowed to go or not, correct?
>
> A. That's correct.[584]

321. McKiernan also explained that fishers are accustomed to locating markers on the ocean floor even where no surface buoy is present. For example, a mooring cannot be seen in open

[583] *Id.* at 48:15-21.

[584] *Id.* at 48:25-49:21.

waters, but they are regularly placed into and removed from the water.[585]

322. Mr. Glenn expressed concern that with an electronic gear marking system—an "honor" system—fishermen might "preemptively go in and mark all the most productive bottom to say, 'My gear is there.'"[586]

323. But one of the Commonwealth's fishermen witnesses explained that the Massachusetts lobster industry is not nearly as territorial as it used to be and the media overplays the competitiveness between lobster fishers.[587] Mark Ring agreed with prior statements he made that "in Gloucester at least, despite the number of lobster boats and the number of fishers that come in from different ports, [he] ha[d] very little conflict."[588] And Mr. Ring testified that he follows all state regulations regarding lobster fishing.[589]

324. And Dr. Moore testified that with investment, experts working on ropeless technology can come up with a viable solution to the gear conflict question in a matter of months.[590] "[I]t's comparable to – can you use your cell phone to figure out if you've been near someone with COVID? With enough money, we can do it in a few months to get it right."[591] Dr. Moore further explained that this work was currently underway.[592]

---

[585] *Id.* at 50:5-22.

[585] *Id.* at 50:5–51:5.

[586] Day 6 Trial Tr. 71:1–16.

[587] Day 8 Trial Tr. 43:22–44:4.

[588] *Id.* at 44:5–9.

[589] *Id.* at 44:10–23.

[590] *See* Day 9 Trial Tr. 154:7–20.

[591] *Id.* at 154:7–20.

[592] *Id.* at 221:17–20.

325. Dr. Moore based these opinions in his considerable experience with ropeless technology—both as the former chair, now vice-chair of the Ropeless Consortium and as an integral member of the SeaWorld Conservation Fund's current grant to study ropeless technology.[593] As the former chair, now vice-chair of the Ropeless Consortium, Dr. Moore convened annual meetings of stakeholders—including U.S. and Canadian fisherman—to discuss the viability of ropeless technology for the industry.[594] The Ropeless Consortium has also published various paper regarding its findings on the workability of ropeless technology.[595]

326. The SeaWorld Conservation Fund also funds Dr. Moore to acquire ropeless systems and then lend them out to commercial fishermen to test and refine the technology.[596] This project is a collaboration with the federal government's Northeast Fisheries Science Center.[597] The SeaWorld Fund has put $300,000 per year for three years towards this project, which is currently in its second year.[598] Through this project, Dr. Moore has invested about half a million dollars in two ropeless systems.[599]

327. As part of this work, Dr. Moore has toured the facilities that manufacture the ropeless traps, spoken with the engineers and salespeople that sell them, and watched "the iterative process of the gear that I own on my grant being modified and developed on the basis of [the]

[593] Day 9 Trial Tr. 144:17–18, 145:11–23.

[594] *See id.* at 143:5–45:23.

[595] *Id.* at 150:7–11.

[596] *Id.* at 145:11–23.

[597] *Id.* at 145:11–23.

[598] *See id.* at 145:11-23.

[599] *See id.* at 149:11–20.

experience" of the fishermen deploying the gear.[600] He works with stakeholders "to improve the efficiency and reliability of the gear."[601]

328. On the basis of this experience, Dr. Moore testified that the ropeless technologies he works with are currently functional and ready to be fished in the commercial fishing industry.[602]

329. Ms. Knowlton agreed that "ropeless is the ultimate solution that fisheries should be aiming for."[603]

330. Finally, although the fishermen that appeared at trial expressed some reticence to using ropeless technology,[604] at least one fisherman testified that if the Commonwealth mandated the use of ropeless fishing in Massachusetts waters he "might try it."[605]

## IV. ARGUMENT

### A. The plaintiff has satisfied the ESA's notice requirement and has standing to bring this action.

A person seeking to bring a citizen suit under § 9 of the ESA must give notice to the relevant federal agency and to the alleged violator more than 60 days before commencing the action.[606] The Commonwealth does not dispute that Mr. Strahan satisfied this requirement.[607] The § 9 violations alleged in the notice were not limited to commercial fishing, and the notice stated it

[600] *Id.* at 150:23–151:8.

[601] *Id.* at 150:23–151:8.

[602] *Id.* at 149:11–23.

[603] Day 7 Trial Tr. 134:22–135:11.

[604] *See, e.g.*, Day 8 Trial Tr. 40:3–8.

[605] Day 10 Trial Tr. 32:9–19.

[606] 16 U.S.C. § 1540(g)(2).

[607] *See supra* ¶ 56.

should be interpreted "in the broadest possible terms."[608]

To establish standing to bring this action, the plaintiff must show: "'(1) that [he] has suffered an injury in fact, (2) that the injury is fairly traceable to the defendant's unlawful actions, and (3) that it is likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision.'"[609] The plaintiff has satisfied these requirements.

*First*, the plaintiff presented evidence at trial showing he has a cognizable interest in protecting endangered whale and sea turtle species from death and injury in Massachusetts waters. He has shown he will be personally and individually affected by the defendants' challenged conduct. This evidence establishes the plaintiff's decades-long interest in and commitment to the protection of endangered marine species, particularly the North Atlantic right whale, through academic work, legislative and legal advocacy, public education and outreach, and scientific study, including his repeated and persistent efforts to stop whales and sea turtles from being entangled,

---

[608] *See* Ex. 603. At trial, a disagreement arose between the parties regarding whether the plaintiff's claims encompassed recreational fishing. *See* Day 1 Trial Tr. 34:3–4; Day 6 Trial Tr. 63:6–64:20; Day 7 Trial Tr. 37:20–38:3. The word "commercial" appears only twice in the 60-day notice served on the Commonwealth and only in reference to allegations not addressed at trial. Ex. 603 at 1. The notice described the alleged ESA § 9 violations as resulting from the Commonwealth's "licensing and regulating the deployment of fishing gear in US coastal waters that kill[s], injures and otherwise takes endangered species of whales and sea turtles currently listed as protected under the ESA." Ex. 603 at 1. While the language of the complaint is more ambiguous, Count I expressly references the Commonwealth's licensing of recreational lobster pot fishing in the description of the ESA § 9 claim. Am. Compl. ¶ 66, ECF No. 90. And pleadings filed by pro se litigants are entitled to liberal construction. *Erickson v. Pardus*, 551 U.S. 89, 94 (2007); *Estelle v. Gamble*, 429 U.S. 97, 106 (1976); *Instituto de Educación Universal Corp. v. U.S. Dep't of Educ.*, 209 F.3d 18, 23 n.4 (1st Cir. 2000); *Dutil v. Murphy*, 550 F.3d 154, 158 (1st Cir. 2008). Because nothing in the 60-day notice limited the scope of the § 9 claim to commercial fishing and the complaint, if unartfully pleaded, did not clearly so limit Count I, the Court should consider all the plaintiff's evidence and argument regarding recreational fishing.

[609] *Animal Welfare Inst. v. Martin*, 623 F.3d 19, 25 (1st Cir. 2010) (quoting *Nulankeyutmonen Nkihtaqmikon v. Impson*, 503 F.3d 18, 26 (1st Cir. 2007)).

harmed, and killed in the VBRs that the Commonwealth licenses.[610] The plaintiff testified that he has a spiritual and aesthetic interest in endangered marine species. He explained that he regularly visits coastal areas of Massachusetts to view and study whales and sea turtles, including North Atlantic right whales and leatherback sea turtles. And he averred that he plans to continue doing so in the future.[611] The plaintiff further established that he has held a recreational license for lobster fishing in Massachusetts since the early 1990s and currently holds a research permit to conduct experimental lobster fishing using a pot without ropes.[612] The First Circuit and this Court have held that these actions and interests satisfy the injury-in-fact requirement.[613]

*Second*, the plaintiff has proved a causal connection between the Commonwealth's conduct and the take of ESA-listed species: the Commonwealth's licensing scheme and requirement that fishers use vertical buoy lines in commercial and recreational trap/pot fishing has caused, and will continue to cause, take of endangered whales and sea turtles.[614]

*Third*, the injunctive relief the plaintiff seeks will redress the plaintiff's injuries. An

---

[610] *See supra* ¶¶ 57–69.

[611] *See supra* ¶¶ 70–72.

[612] *See supra* ¶ 73.

[613] *See Animal Welfare Inst.*, 623 F.3d at 25; *Rowley v. City of New Bedford*, 333 F. Supp. 3d 30, 36–37 (D. Mass. 2018) (holding that "an aesthetic, emotional, and spiritual" relationship with individuals of the species and regular engagement in advocacy efforts, public education, and outreach on behalf of the species satisfies the standing requirements); *Strahan v. Linnon*, 967 F. Supp. 581, 617 (D. Mass. 1997); *Coxe*, 939 F. Supp. at 978 (holding that evidence that the plaintiff regularly observes the wildlife species that is the subject of the action satisfies the standing requirement of an injury in fact); *id.* (holding that scientific research on the species satisfies the standing requirement); *Rowley*, 333 F. Supp. 3d at 36.

[614] *Coxe*, 127 F.3d at 163 ("The statute not only prohibits the acts of those parties that directly exact the taking, but also bans those acts of a third party that bring about the acts exacting a taking.").

injunction that prohibits the Commonwealth from requiring or permitting the use of VBRs in trap/pot fishing by Massachusetts-licensed fishers will prevent additional takes of endangered species.

**B. The Commonwealth is liable for "take" under the ESA because it requires commercial trap/pot fishers to use VBRs (and permits recreational trap/pot fishers to do the same), entangling endangered marine species.**

To prevail, the plaintiff must demonstrate: (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.[615] The evidence the plaintiff adduced at trial meets this standard.

**1. The Commonwealth's VBRs licensing scheme has caused the take of endangered whales and sea turtles.**

Massachusetts licenses all commercial and recreational fishing in Massachusetts waters and licenses the landing of fish in Massachusetts ports, whether caught in Massachusetts or federal waters.[616] Massachusetts requires all licensed commercial fishers to use VBRs when deploying traps and pots. And the state permits licensed recreational fishers to use VBRs.[617]

Whales and turtles regularly and repeatedly get entangled in VBRs. One study revealed that 83% of observed right whales showed evidence of at least one entanglement event, while 59% showed evidence of more than one entanglement event.[618] The evidence proves that pot/trap VBRs account for the vast majority of known whale entanglement events.[619] But who owns the rope, what fishery the rope was used in, and even in which country the rope originated, are

---

[615] *Am. Bald Eagle v. Bhatti*, 9 F.3d 163, 166 (1st Cir. 1993).

[616] *See supra* ¶¶ 88–89.

[617] *See supra* ¶ 90.

[618] *See supra* ¶ 121.

[619] *See supra* ¶ 124.

questions rarely answered.[620] Gear is retrieved in only one out of five entanglement events. And even when it is retrieved, it often cannot be traced to a particular fishery.[621] Furthermore, most entanglements go unobserved.[622]

For this reason, the best way to assess whether a particular licensing scheme will cause the take of endangered whales and sea turtle is to examine where those species swim and where VBRs are deployed. Indeed, the Commonwealth's reliance on the DST to justify its new regulations concedes this: the DST calculates risk based on where whales and VBRs overlap (and gear characteristics), not based on traceable entanglement cases.[623]

The North Atlantic right whale may be found in waters fished by Massachusetts-licensed fishers in any month of the year.[624] Cape Cod Bay is an increasingly important habitat for the species, hosting large congregations of whales in the spring months.[625] While a lack of systematic surveillance outside the February to May period has resulted in a relative dearth of data regarding right whales' presence in Massachusetts waters from late May to February,[626] opportunistic and acoustic data show the species is present in Massachusetts waters throughout the year.[627]

There are about 80,000 to 100,000 individual VBRs in Massachusetts waters.[628] And most

---

[620] *See supra* ¶¶ 128–29.

[621] *See supra* ¶ 129.

[622] *See supra* ¶ 119.

[623] *See supra* ¶ 185

[624] *See supra* ¶ 79.

[625] *See supra* ¶ 77.

[626] *See supra* ¶¶ 93–95.

[627] *See supra* ¶ 79.

[628] *See supra* ¶ 108.

of these are set in areas that are currently designated critical habitat for the right whale.[629] As all the experts—including the state's—emphasized at trial, this overlap of ropes and whales in time and space all but guarantees that the Commonwealth's licensing scheme has entangled endangered species.[630]

Furthermore, despite the difficulty of tracing the origin of an entanglement, there *are* known cases of right whale entanglements in gear set by Massachusetts-licensed fishers in Massachusetts waters. In 2016, and likely in 2017 and 2018, right whales were found entangled in gear licensed by the Commonwealth.[631] Given the infrequency with which gear is retrieved from entangled whales and subsequently identified, these documented cases likely represent a very small number of the entanglements that Commonwealth-licensed gear cause.

Entanglement in Massachusetts-licensed VBRs harms and kills right whales.[632] Rope entanglements can drown a whale, cause it to slowly and painfully waste away, can prevent it from reproducing, and can impede its ability to swim, nurse, feed, and fend off predators.[633] Chronic entanglement in VBRs have reduced the number of right whale calves born each year, reduced the strength and size of right whales, and increased their susceptibility to disease, among other impacts.[634]

---

[629] *See supra* ¶¶ 110–111.

[630] *See supra* ¶¶ 122–123.

[631] *See supra* ¶¶ 136–139.

[632] *See supra* ¶¶ 143–145.

[633] *See supra* ¶¶ 146–147, 150.

[634] *See supra* ¶¶ 148–159.

These entanglements constitute take under the ESA and are strictly prohibited.[635] They are causing acute and chronic harm to individual whales,[636] are causing the species to go extinct,[637] and are preventing the species from recovering its population size to a sustainable level.[638] Massachusetts is liable for these takes through its licensing scheme that permits and requires the use of VBRs by trap/pot fishers.[639]

**2. Killing, seriously injuring, moderately injuring, reducing the reproductive ability of, and decreasing the body size of North Atlantic right whales constitute takes.**

First and foremost, the harms that entanglements inflict on North Atlantic right whales—including death, serious injury, moderate injury, reduced reproductive capacity, decreased body size, and reduced ability to feed and swim—meet the ESA and MMPA's definitions of "take." As previously explained, under the ESA, "'[t]ake' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[640] The regulations define "harm," as used in the ESA, to include "significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering."[641] Put simply, "'[t]ake' is defined . . . in the broadest possible manner to include every conceivable way in which a

[635] *See supra* ¶¶ 10–12.

[636] *See supra* Section III.F.6.a.

[637] *See supra* ¶ 87.

[638] *See supra* Section III.F.6.b(1).

[639] *See supra* ¶¶ 13–14, 90.

[640] 16 U.S.C. § 1532(19).

[641] 50 C.F.R. § 222.102.

person can 'take' or attempt to 'take' any fish or wildlife."[642] The MMPA's definition of take is no less broad.[643]

Under these definitions, killing and seriously injuring endangered whales and sea turtles obviously constitute takes. But the concept is not limited to such insults.

*First*, the Commonwealth's expert conceded that even moderate injuries caused by entanglements wound or harm whales. Ms. Knowlton defined moderate entanglement injury as one that "might be much more extensive in the scarring and it's started to go into the blubber tissue,"[644] and acknowledged that such moderate injuries seem to have "some health implications for reproductive females"—"a decline in their health."[645] Such physical injuries and declines in health can be described as "wounds" and "harms," and therefore meet the ESA's definition of take.

*Second*, Dr. Moore, Dr. Sharp, and Ms. Knowlton agreed that entanglement drag—whether such drag leads to visual injuries—can reduce a whale's ability to reproduce and nurse its young.[646] The ESA defines "harm" to "include[s] . . . degradation which . . . injures . . . wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, [and]

---

[642] S. Rep. No. 93–307, at 7 (1973).

[643] Under the MMPA, the term "take" means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."16 U.S.C. § 1362(13). The regulations define "take" to mean "to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal. This includes, without limitation, any of the following . . . the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal . . . or the doing of any other negligent or intentional act which results in disturbing or molesting a marine mammal . . . ." 50 C.F.R. § 216.3.

[644] Day 6 Trial Tr. 135:24–25.

[645] *Id.* at 136:18–20.

[646] *See supra* ¶¶ 144–145, 149–52.

rearing . . . ."[647] Similarly, MMPA defines "harassment" as "any act of pursuit, torment, or annoyance which . . . has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, . . . nursing [and] breeding . . . ."[648] Thus, entanglement-caused sublethal harm to reproductive and nursing ability constitute takes under the ESA and MMPA.

*Third*, the entanglement-driven decrease in body size that the North Atlantic right whale species has undergone[649] constitutes take. The one-meter shrinkage that Dr. Moore and Ms. Knowlton documented in their June 2021 study is clearly harm and/or harassment under the ESA[650] and MMPA,[651] as the shrinkage likely inhibits reproduction, ability to travel, and ability to avoid future entanglement.[652]

Finally, any time an entanglement—irrespective of whether it creates an entanglement scar—reduces a right whale's ability to feed or swim (and therefore migrate), such an entanglement constitutes a take.[653]

**3. Massachusetts is likely to cause take of endangered whales and turtles in the future.**

In response to this lawsuit, Massachusetts took steps to reduce its liability for the takes its VBR licensing scheme causes. It adjusted the borders of its seasonal closure period to include some

[647] 50 C.F.R. § 222.102.

[648] 16 U.S.C. § 1362(18)(A).

[649] *See supra* ¶¶ 153–156.

[650] 16 U.S.C. § 1532(19).

[651] 16 U.S.C. § 1362(13).

[652] *See supra* ¶ 156.

[653] *See* 50 C.F.R. § 222.102 (ESA); 16 U.S.C. § 1362(18)(A) (MMPA).

North Shore waters; it extended the closure period by two weeks; it capped roped diameter at 3/8 inch; and it instituted some measures to shift the Massachusetts lobster fishery over to rope with a 1,700 lbs or lower breaking strength.[654]

But the past will be prologue. None of these half-measures will eliminate the risk of entanglement to right whales in Massachusetts waters. Entanglement in Massachusetts-licensed VBRs in the future will remain *likely* and thus the Commonwealth will remain liable for take. The Commonwealth's best-case scenario—that these measures will reduce the risk of serious injury or mortality caused by VBRs—does not satisfy the ESA's standards since it does not eliminate take. But even then, the Commonwealth has failed to demonstrate at trial that there is any chance that its regulatory changes will significantly reduce the risk of serious injury or mortality to right whales. Ultimately, so long as VBRs remain in the water, Massachusetts will continue to take endangered species, irrespective of its recent efforts.

*First*, the Commonwealth's farthest-reaching mitigation measure—the adoption of 1,700 lbs break strength rope—was predicated on a paper published six years ago by its expert, Amy Knowlton. The paper had two principal conclusions: (1) that the severity of an entanglement event correlates with the break strength of the rope, with 1,700 lbs being a critically important level; and (2) that the use of 1,700-lb breaking strength rope will reduce the number of life-threatening entanglements for large whales, including right whales, by 72%.[655] As interrogation of Ms. Knowlton's methodology at trial revealed, these conclusions are unsupportable.

The paper was based on a paucity of data. Although there have been over 1,600

[654] *See supra* ¶ 211.

[655] *See supra* ¶¶ 217, 227.

documented entanglements of right whales, the paper only analyzed 132 ropes retrieved from 70 entanglement incidents, and just 4% of all documented right whale entanglements.[656] And the paper's principal conclusion—that 1,700-lb breaking strength rope is less likely to seriously injure or kill *adult* north Atlantic right whales—was based on a very small sample size: seven whales.[657] The paper did not contain any data on how much rope of what strength was present in the water during the study period.[658] This alone seriously challenges the paper's conclusions: how is possible to know whether the supposed correlation between rope strength and injury severity is caused by the quality of the rope or just because there is more of that rope in the water to begin with?

The paper considered only the break strength of the ropes when they were brand new, even though the age of the rope when it entangled the whale was unknown and ropes decrease in strength over time as they degrade.[659]

In cases where whales were entangled in multiple ropes, only the strongest rope was considered, even though it was not possible to discern which rope first entangled the whale nor which rope was most responsible for the harm.[660] This choice meant that nearly half of the ropes—and more than half of the ropes with a break strength of 1,700 lbs or less when new—were excluded from the study.[661] Discarding 47% of the data—all of which was from weaker test rope—strongly biased the results in favor of the conclusion that authors sought to reach. Particularly

[656] *See supra* ¶ 221.

[657] *See supra* ¶ 225.

[658] *See supra* ¶ 223.

[659] *See supra* ¶ 222.

[660] *See supra* ¶ 224.

[661] *See supra* ¶ 224.

when no statistically significant results were shown for two measures (differences between minor to moderate, and moderate to severe injuries), inclusion of the 47% of the data from weaker ropes may well have resulted in no statistically significant results on any measure.

As Ms. Knowlton explained at trial, the 72% figure is based purely on the number of whales in the data set that were determined to be entangled in rope with an estimated breaking strength of greater than 1,700 lbs.[662] Thus, Ms. Knowlton's conclusion that reduced breaking strength rope could reduce life threatening entanglement event by 72% is based solely on the fact that in her limited data set, 72% of the recovered ropes had a tested break strength of greater than 1,700 lbs.

In short, Ms. Knowlton's paper cannot and should not form the basis—let alone the only support—for any conclusion of the impacts or effects of the Commonwealth's weak rope mitigation measure.

*Second*, as the state concedes, its new weak rope requirement will not reduce the incidence of whale and sea turtle entanglements. To break a line, an animal must first become entangled in that line. And there is no evidence—from the Commonwealth's expert, Ms. Knowlton, or otherwise—that the use of less than 1,700-lb break strength rope will reduce the sub-lethal harms associated with entanglements.[663] Because the Knowlton study's conclusions about the health impacts of entanglements was based on scarring evidence caused by the rope, it did not account for most sublethal impacts of entanglements, such as change in body mass, changes in feeding

[662] *See supra* ¶ 230.

[663] *See supra* ¶ 238.

behavior and habits, or whether a whale was already compromised by other rope entanglements.[664] Perhaps most importantly, there is no evidence that reduced break strength rope will ameliorate the negative impact that entanglements have on the North Atlantic right whale's ability to reproduce. And without a change to the species' calving rates, the population cannot recover. In short, wherever VBRs and whales cooccur, whales and sea turtles will be entangled and taken.

*Third*, Dr. Moore and Ms. Knowlton's recent work on the impact of entanglement on right whale size, and therefore strength, casts doubt on the notion that 1,700-lb break strength rope will reduce the number of deaths and serious injuries that entanglements cause. In Ms. Knowlton's study, no data from entanglement events post-2010 were collected. So the decreasing size of right whales (and thus their diminishing strength to break free from entanglements) may not be reflected in the dataset.[665] And there is no dispute that the Commonwealth's 1,700-lb rope requirement will have no impact on the dangers VBRs pose to right whale calves and sea turtles.[666]

*Fourth*, a rope's break strength is only one of myriad factors that determines the severity of an entanglement. A weak rope can still seriously injure and kill a right whale depending on the entanglement's configuration, the rope's friction, and sometimes its diameter.[667] Ms. Knowlton's paper did not consider that entanglement severity depends on these factors, not just (or even) the break strength of the rope.[668]

Furthermore, the way in which most Massachusetts fishermen intend to meet the

---

[664] *See supra* ¶¶ 238–41.

[665] *See supra* ¶¶ 153, 226.

[666] *See supra* ¶¶ 255–58.

[667] *See supra* ¶¶ 242–54.

[668] *See supra* ¶ 253.

Commonwealth's new rope strength requirement—through splicing weak inserts into their existing lines—tends to undermine the efficacy of the regulation. Because these weak inserts are only effective when exposed to the appropriate force, they will be useless if buried within multiple wraps on the whale's body parts.

*Fifth*, although the Commonwealth's extension of the seasonal closure period's borders is a step in the right direction, this marginal change is insufficient to prevent the take of North Atlantic right whales and sea turtles in Massachusetts waters. Right whales and sea turtles swim in Massachusetts waters outside the closure period and in waters not impacted by the closure period.[669]

*Sixth*, NMFS's May 2021 analysis, utilizing its Decision Support Tool, does not provide any support for the Commonwealth's position. The DST and its risk reduction conclusions regarding Massachusetts's recent regulatory measures were discredited at trial, as they: (a) rely heavily on Amy Knowlton's data regarding rope breaking strength;[670] (b) fail to reflect that some of the measures, like the area closures, are already in place (so the Commonwealth's moderate expansion and extension of the closure gets more credit than it should);[671] and (c) improperly attribute risk reduction benefits to the Commonwealth's actions that instead resulted from an increase in the number of whales utilizing Cape Cod Bay during the existing area closure.[672]

Based on the evidence from trial, there is simply no support for the Commonwealth's conclusion that adoption of 1,700-lb breaking strength rope and 3/8" diameter rope requirements

[669] *See supra* Section III.B.

[670] *See supra* ¶ 185.

[671] *See supra* ¶¶ 298–99.

[672] *See supra* ¶ 301.

will result in the hoped-for 72% reduction in entanglements of right whales or that it will appreciably reduce significant injuries or mortalities of right whales, let alone that it will eliminate the Commonwealth's liability for take of right whales and sea turtles. The other mitigation measures do not accomplish the task, either: neither the two-week extension nor the North Shore addition remove 80,000 to 100,000 VBRs from Massachusetts waters during late spring, summer, fall, and early winter, when right whales—even if not congregating in massive numbers in Cape Cod Bay—are traveling in Massachusetts waters.

**C. The ESA mandates enjoining the Commonwealth's licensure of VBRs in state waters.**

**1. The ESA mandates enjoining an activity when that activity imperils the survival of an endangered species.**

Section 11 of the ESA, titled "Penalties and Enforcement," provides for three broad classes of penalties or remedies for violations of the Act: civil penalties, criminal penalties, and injunctive relief.[673] The third is the focus of this suit. Under the ESA, "any person" is empowered "to enjoin any person, including the United States and any other governmental instrumentality or agency . . . who is alleged to be in violation of any provision" of the ESA.[674] However, the power of citizen attorney generals goes no further: a private citizen may seek neither civil nor criminal penalties.[675] As a result, the only remedy a court may order in response to a citizen suit is injunctive relief.

With the issue of *what* remedy settled, the question becomes *when*: when must a court use the injunctive power the ESA proscribes to end an ESA violation? In *TVA*, the Supreme Court

[673] 16 U.S.C. § 1540.

[674] 16 U.S.C. § 1540(g).

[675] *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*." (emphasis added)).

answered this question.[676] The Supreme Court held that where "there is an irreconcilable conflict between" certain conduct "and the explicit provisions of . . . the Endangered Species Act,"[677] "Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities . . . ."[678] Put simply, where certain conduct will necessarily violate the ESA—here, § 10, in *TVA*, § 7—an injunction against that conduct must issue.

The facts of *TVA* parallel those here. In *TVA*, the plaintiffs sought to enjoin the construction of a dam that would destroy the snail darter's critical habitat.[679] At the time of suit, 80% of this $78 million-dollar project was complete. Because all this money and work "would be wasted" if the court scrapped the project to save the snail, "the District Court declined to embrace the plaintiffs' position . . . that once a federal project was shown to jeopardize an endangered species, a court of equity is compelled to issue an injunction restraining violation of the Endangered Species Act."[680]

After holding a trial on the merits of the plaintiffs' claim, the district court "found that closure of the dam and the consequent impoundment of the reservoir would result in the adverse

---

[676] *TVA*, 437 U.S. at 156 ("The question[] presented in this case [is] whether the Endangered Species Act of 1973 requires a court to enjoin the operation of a virtually completed federal dam—which had been authorized prior to 1973—when, pursuant to authority vested in him by Congress, the Secretary of the Interior has determined that operation of the dam would eradicate an endangered species . . . .").

[677] *Id.* at 193.

[678] *Id.* at 194.

[679] *Id.* at 165 (quoting *Hill v. Tenn. Valley Auth.*, 419 F. Supp. 753, 757 (E.D. Tenn. 1976)).

[680] *Id.* at 166.

modification, if not complete destruction, of the snail darter's critical habitat."[681] The Supreme Court accepted this premise[682] and held that the dam's construction must be halted.[683] As the Court explained, "[t]he plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost."[684]

Just so here. The plaintiff has shown—through a merits trial—that the Commonwealth's licensing and requirement of VBR fishing takes North Atlantic right whales in violation of § 10. These VBRs modify the North Atlantic right whale's critical habitat,[685] killing them, seriously injuring them, preventing them from reproducing and nursing their young, and even shrinking them.[686] These harms force the Court's hand: the ESA demands protection of the species.[687]

The Supreme Court reaffirmed *TVA*'s interpretation of the ESA in *Weinberger v. Romero-Barcelo*,[688] a case concerning the scope of Federal Water Pollution Control Act (FWPCA). Facing the question of whether the FWPCA required injunctive relief, the Court reiterated that only "a clear and valid legislative command" can limit the "comprehensiveness of [the judiciary's] equitable

---

[681] *Id.* at 165 (quoting *Hill*, 419 F. Supp. at 757).

[682] *Id.* at 171.

[683] *Id.* at 195.

[684] *Id.* at 184.

[685] *See supra* ¶¶ 105–08, 122–23.

[686] *See supra* Section III.F.6.

[687] *See TVA*, 437 U.S. at 194 ("Our individual appraisal of the wisdom or unwisdom of a particular course consciously selected by the Congress is to be put aside in the process of interpreting a statute. Once the meaning of an enactment is discerned and its constitutionality determined, the judicial process comes to an end.").

[688] 456 U.S. 305 (1982).

jurisdiction."[689] "Unless 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."[690] The Court then cited the ESA as an example of a law that *did* restrict equitable jurisdiction:

> In [*TVA*], we held that Congress had foreclosed the exercise of the usual discretion possessed by a court of equity. There, we thought that "[o]ne would be hard pressed to find a statutory provision whose terms were any plainer" than that before us. The statute involved, the Endangered Species Act, required the District Court to enjoin completion of the Tellico Dam in order to preserve the snail darter, a species of perch. *The purpose and language of the statute under consideration in* Hill, *not the bare fact of a statutory violation, compelled that conclusion.* . . . The statute thus contains a flat ban on the destruction of critical habitats.[691]

Where the conduct at issue unavoidably causes a killing of an endangered species, the ESA requires courts to enjoin that conduct.

The Supreme Court validated this holding for a third time in *United States v. Oakland Cannabis Buyers' Cooperative*,[692] a case regarding injunctive relief under the Controlled Substances Act (CSA). There, the government argued that the district court lacked discretion in fashioning injunctive relief, citing *TVA v. Hill*.[693] In rejecting this argument, the Supreme Court contrasted the discretion afforded courts in the CSA to the lack of discretion afforded courts in the ESA: "Congress' 'order of priorities,' as expressed in the [ESA], would be deprived of effect if the

---

[689] *Id.* at 313 (quoting *Porter v. Warner Holding Co.*, 328 U.S. 395, 398 (1946)).

[690] *Id.* (quoting *Porter*, 328 U.S. at 398).

[691] *Id.* (quoting *TVA*, 437 U.S. at 173).

[692] 532 U.S. 483 (2001).

[693] *Id.* at 496.

District Court could choose to deny injunctive relief. . . . In effect, the District Court had only a Hobson's choice."[694]

In *Coxe*, the First Circuit accepted *TVA*'s framework and applied it to a nearly identical ESA violation as the one at issue here. First, the *Coxe* court acknowledged that "[a]lthough it is generally true in the preliminary injunction context that the district court is required to weigh and balance the relative harms to the non-movant if the injunction is granted and to the movant if it is not, in the context of ESA litigation, that balancing has been answered by Congress' determination that the '*balance of hardships and the public interest tips heavily in favor of protected species*.'"[695] Thus, the First Circuit recognized that courts should not balance the relative harm to the non-movant against the injury to the species.

Second, the First Circuit recognized that the ESA *mandates* enjoining the conduct where that conduct inescapably imperils an endangered species. Citing *TVA*, the *Coxe* court explained that where "the activity at issue [will] cause[] eradication of an entire endangered species if not enjoined, the only remedy that [can] prevent that outcome [is] a permanent injunction halting the activity."[696]

After acknowledging these principles, the *Coxe* court determined that—*based on the factual*

---

[694] *Id.* at 497 (citing *TVA*, 437 U.S. at 194).

[695] 127 F.3d at 171 (emphasis added) (quoting *Nat'l Wildlife Fed'n v. Burlington N. R.R.*, 23 F.3d 1508, 1510 (9th Cir. 1994); *Weinberger*, 456 U.S. at 312).

[696] *Coxe*, 127 F.3d at 171. The First Circuit reading of the ESA and the Supreme Court's decision in *TVA* is echoed in other circuit court decisions. *See, e.g.*, *Nat'l Wildlife*, 23 F.3d at 1510.

*record available in 1997*—an injunction completely halting the use of VBRs was not necessary.[697] As a result, the ESA did not require the court on that record to impose the "extreme measures" sought by the plaintiff: "The district court was not required to go any farther than ensuring that any violation would end."[698]

A quarter of a century later, we know what the *Coxe* court did not: the only remedy that will "ensur[e]" the Commonwealth's "violation [will] end" is the removal of VBRs from its waters.[699] As described above, there is no scientific or factual support for the Commonwealth's contention that its recent regulatory changes will eliminate take of endangered whales or turtles by Massachusetts-licensed fishers. The Commonwealth's marginal extension of the closure period's dates and borders in combination with its reduced break strength requirement of undetermined efficacy are a shuffle of the deck chairs while the North Atlantic right whale sinks. A permanent injunction must issue.

**2. Commercial interests should not be considered in the Court's remedy determination.**

Because an injunction is a statutory remedy under the ESA, and not an equitable remedy,

---

[697] *Coxe*, 127 F.3d at 171 (observing that the district court has found, on the record before it 25 years ago, that there may be other measures to mitigate use such that VBRs would not inescapably lead to the extinction of the Northern Right Whale).

[698] *Id.*

[699] *Id.* (citing *TVA*, 437 U.S. at 193–95; *Weinberger*, 456 U.S. at 311 (1982)). Congress articulated two purposes of the Act as being "to provide a means whereby the ecosystems upon which endangered species and threatened species depend on may be conserved, [and] to provide a program for the conservation of such endangered and threatened species . . . ." 16 U.S.C. § 1531(b). The Supreme Court observed the "seriousness with which Congress viewed" this purpose, noting that "the Act specifically defined 'conserve' as meaning 'to use and the use of *all methods and procedures which are necessary* to bring *any endangered species* or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.'" *TVA*, 437 U.S. at 180 (quoting 16 U.S.C. § 1532).

the traditional balancing of the equities does not apply. Once a plaintiff has proven liability, a court must enjoin the activity.[700] Nonetheless, based on prior rulings in this action, the plaintiff acknowledges that this Court might nonetheless wish to "weigh and balance the relative harms to the non-movant if the injunction is granted and to the movant if it is not."[701]

As the foregoing sections explain, continued Massachusetts' licensure and requirement of VBRs in its waters will likely cause an irreparable injury to the North Atlantic right whale.[702] Human-related activities cannot kill or seriously injure a single North Atlantic right whale without threatening the species' survival.[703] North Atlantic right whales are at risk of both serious injury and death wherever they encounter VBRs,[704] and they swim through Massachusetts waters when tens of thousands of VBRs are in the water.[705] And because entanglements—even those that do not cause death or serious injury—reduce the reproductive capacity of North Atlantic right whales,[706] the Commonwealth's VBR scheme is likely to irreparably harm the species even without kills or serious injuries.[707] Calving rates are just as critical as killing rates: if the North Atlantic right whale can't produce enough calves to replace the whales that die—for whatever reason—the species will go extinct.

---

[700] *Weinberger*, 456 U.S. at 314.

[701] *Coxe*, 127 F.3d at 171.

[702] *See supra* Sections III.D, III.F.

[703] *See, e.g.*, Ex. 578 ¶ 10 (every further entanglement of a North Atlantic right whale is an unacceptable threat to the continued survival of the species); Ex. 1030 at 2-35 ("North Atlantic right whales have continued to experience unsustainable levels of mortality from entanglement.").

[704] *See supra* Section III.F.3.

[705] *See supra* Section III.B.

[706] *See supra* Section III. F.6.b(1).

[707] *See supra* ¶ 152.

Unlike the right whale, the lobster industry will not go extinct if it is required to adjust the technology its uses to catch lobsters. The Commonwealth's economic and fishing culture experts assumed that the removal of VBRs meant the end of lobster fishing.[708] But as DMF's employees and the Commonwealth's expert, Amy Knowlton, recognized at trial, an alternative to VBR fishing exists.[709] With investment in the gear conflict question, ropeless fishing could replace VBRs within a year.[710] The Commonwealth failed to adduce any evidence at trial proving such a solution unworkable. To the contrary, the Director of DMF testified that the Commonwealth has successfully navigated gear conflict questions for years.[711] And his deputy, Robert Glenn, acknowledged that ropeless technology has been used to retrieve traps from the ocean floor for two decades.[712] Finally, at least one fisherman acknowledged that if the Commonwealth mandated the use of ropeless fishing in Massachusetts waters he "might try it."[713]

These realities—that continued licensing of VBRs spells the end for the North Atlantic right whale but not the lobster industry—favor injunctive relief; especially so considering the weight placed on the scale on the side of the species by the ESA.

**D. Requiring the Commonwealth to pursue an incidental take permit (ITP) as the sole remedy is inadequate as a matter of law and fact.**

In April 2020, the Court ordered the Commonwealth to obtain an ITP. Because the Commonwealth knows it cannot obtain this ITP so long as its lobster fishery is considered part of

---

[708] *See supra* ¶¶ 304, 309.

[709] *See supra* ¶ 329.

[710] *See supra* ¶ 324.

[711] *See supra* ¶¶ 317-19.

[712] *See supra* ¶ 315.

[713] Day 10 Trial Tr. 32:9–19.

the whole American Lobster Fishery, it is pursuing separate designation of the Massachusetts lobster fishery. In other words, DMF is asking NMFS to reclassify the Massachusetts lobster fishery as its own fishery so that Massachusetts even has a shot at obtaining an ITP. But the Commonwealth's efforts on this front fail as matter of law and fact.

**1. An ITP-only remedy is inadequate a matter of law.**

First, as a matter of law, an ITP is prospective only; it cannot authorize take that has already occurred.[714] Any take that has already occurred or that will occur between now and whenever NMFS issues an ITP (if it ever does) will violate the ESA. And the Commonwealth has repeatedly noted that the ITP process is, by its very nature, protracted. It will take at least two years but likely much more. As a result, the Court must enjoin the Commonwealth's violative actions unless and until it obtains and ITP.

**2. An injunction only ordering the Commonwealth to obtain an ITP would be futile.**

An ITP-only remedy is also inadequate a matter of fact. The Commonwealth witnesses conceded that to secure an ITP, NMFS would first have to reclassify trap/pot fishing in Massachusetts waters as a fishery separate from the American Lobster fishery.[715] But NMFS will not grant this reclassification on the basis of the Commonwealth's current regulations. As a result, ordering the Commonwealth to obtain an ITP, without any accompanying prohibition on VBR

[714] 16 U.S.C. § 1539(g) (persons claiming benefit of ITP have burden of proof of proving that the ITP "is applicable, has been granted, and was valid and in force at the time of the alleged violation").

[715] Day 6 Trial Tr. 10:10-15 ("[I]n the process of trying to seek an incidental take permit, it became – we were made aware by National Marine Fisheries Service that as being part of the larger fishery, the Northeast/Mid-Atlantic trap/pot fishery for lobster, that because we were only a small portion of it, *we couldn't possibly achieve an incidental take permit . . . .*").

fishing, will only allow further take to occur while the State pursues a fool's errand.

**a. NMFS's prior denial of the Commonwealth's and Maine's requests for separate fishery designations renders futile DMF's renewed attempt for the reclassification.**

First, NMFS has already denied DMF's request to create a separate Massachusetts lobster fishery. In October 2020, DMF asked NMFS to classify its lobster fishery separately from the rest of the American lobster fishery. NMFS denied this request.[716] Since that denial the facts supporting DMF's argument have disintegrated.

In its 2020 request, DMF argued that—pending their passage—three new regulations favored reclassification of the Massachusetts trap/pot fishery: (1) a Massachusetts Bay Restricted Area that covered *all* state waters; (2) a universal requirement of 1,700-lb breaking strength rope; and (3) a ban on fishing single traps by the majority of its active fleet.[717] But DMF failed to secure passage of measures (1) and (3): the Massachusetts Bay Restricted Area expansion does not include any Massachusetts waters south of Cape Cod[718] and the ban on fishing singles did not pass.[719] With respect to DMF's new reduced break strength rope requirement, NMFS's updated ALWTRP will impose this regulation on the rest of the American Lobster fishery.[720] Therefore, this regulation no longer distinguishes DMF's proposed Massachusetts fishery from other parts of the American lobster fishery. Other sources the Commonwealth cited to distinguish Massachusetts's

[716] *See supra* Section III.J.4.a. Maine made the same request three times and NMFS denied it each time. *See supra* Section III.J.4.b.

[717] Ex. 116 at 3037-38.

[718] Ex. 225 at CW035578.

[719] *See* Ex. 232.

[720] *See supra* ¶ 187.

conservation efforts from those of the rest of the American lobster fishery (e.g., the dynamic extension, permitting that reduces effort over time, declining effort overall) remain unchanged since the last denial.

The only new regulation the Commonwealth has passed that did not appear in DMF's prior LOF application is the Commonwealth's new gear marking regulations.[721] Passed in early 2021, these regulations are intended to identify whether VBRs (if found on an entangled or dead right whale) came from Massachusetts-licensed commercial fisherpersons. But this regulation will do nothing to protect North Atlantic right whales from entanglements—post hoc tracing is not preventative.

In sum, the Commonwealth has not implemented any "major changes to [its] lobster gear and fishing practices . . . making this gear unique and easily identified from other state and Federal gear. . . ."[722] Given these facts, it is highly unlikely the Commonwealth will succeed in persuading NMFS to reclassify Massachusetts trap/pot fishing as a distinct fishery. Indeed, the only action Massachusetts could take to legitimately differentiate itself from other lobster fisheries would be to require ropeless fishing.

**b. Massachusetts' attempts to obtain a separate fishery classification conflict with the definition of "fishery" under the MMPA and the Magnuson Stevens Fishery Conservation and Management Act.**

Second, the Commonwealth will not be able to obtain separate classification of its lobster fishery because such a fishery would fail the statutory definition. Rather than create its own definition of "fishery," the MMPA imports that of the Magnuson Stevens Fishery Conservation

[721] Day 6 Trial Tr. 11:3-12:5; Day Trial Tr. 10 119:6-120:11.

[722] 86 Fed. Reg. 3,028, 3,037–38 (Feb. 16, 2021).

and Management Act (MSA).[723] Both the MSA and MMPA defined "fishery" as: "(A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks."[724]

Nothing distinguishes lobsters caught in Massachusetts waters from those fished in other state and federal waters. Specifically, there are no scientific, technical, recreational, or economic characteristics that differentiate lobsters caught in Massachusetts waters from those caught elsewhere on the Eastern seaboard.[725] To the contrary, Mr. Lorentzen and Mr. McKiernan testified at trial that lobsters migrate from Massachusetts state waters into federal waters (and then back again), depending on the time of the year.[726] Thus, the lobsters fished in Massachusetts are actually the same exact animals being fished in federal waters. As a result, under the MMPA and MSA, the Massachusetts lobster fishery cannot qualify as its own fishery.

Congress selected the MMPA's definition of fishery intentionally: categorizing fisheries by the boundaries of the relevant stock's range prevents different jurisdictions from gerrymandering fishery borders to escape the MMPA's requirements.

If the Commonwealth's licensing scheme requires use of gear typical to that of other participants in the American Lobster fishery (i.e., use of vertical buoyed end lines that attach to traps, trawl lines, etc.), lobstering in Massachusetts waters poses similar risks and is deserving of the

[723] 50 C.F.R. § 229.2 ("Fishery has the same meaning as in section 3 of the Magnuson Fishery Conservation and Management Act (16 U.S.C. 1802)).

[724] 16 U.S.C. § 1362(16) (MMPA); 16 U.S.C. § 1802(13) (MSA).

[725] *See* Ex. 2002 at 1-2.

[726] *See supra* note 219.

same classification as trap/pot fishing in federal and other state waters.

**c. A separate Massachusetts trap/pot fishery is inconsistent with NMFS's June 2020 policy statement.**

Third, NMFSs clarified that it would not create separate fisheries to enable specific jurisdictions to more easily obtain negligible impact determinations (NIDs). In a 2020 policy statement, NMFS refined the criteria for determining "negligible impact" under the § 101(a)(5)(E) of the MMPA. One feature of NMFS's new policy directive is that it ostensibly allows NIDs for separate fisheries. But NMFS explicitly rejected the notion of creating a separate fishery to gerrymander an NID ruling. As NMFS explained in the directive, "[f]isheries are defined and classified on the LOF based on gear type and fishing operations as related to the risk of killing or injuring marine mammals. Fisheries should not be redefined or split on the LOF solely for purposes of making a negligible impact determination."[727]

NMFS has indicated that the only way to obtain separate fishery status is to implement regulations that require fishers to use gear that presents fundamentally different risks to North Atlantic right whale than traditional, buoyed endlines[728]—i.e., ropeless gear. Thus, NMFS will only classify Massachusetts as a separate lobster fishery if it enacts regulations which do away with VBRs. Such a regulatory change would distinguish Massachusetts' gear and practices from those of

[727] NMFS Procedure 02-204-02, *Criteria for Determining Negligible Impact under MMPA Section 101(a)(5)(E)* (June 17, 2020), https://media.fisheries.noaa.gov/dam-migration/02-204-02.pdf; *see also Response to Public Comments on NMFS Procedure 02-204-02: Criteria for Determining Negligible Impact under MMPA Section 101(a)(5)(E)*, https://media.fisheries.noaa.gov/dam-migration/nmfs_response_to_comments_for_pd_02-204-02_508.pdf ("[T]he directive specifically notes that fisheries should not be redefined or split on the MMPA LOF solely to facilitate a negligible impact determination and based on the current LOF, the scenario of concern appears unlikely to occur.").

[728] *See supra* ¶ 279.

other states and federal fisheries. And this change would enable Massachusetts it to make a real showing of negligible impact to endangered marine species.

**d. Without ropeless regulations, a separate Massachusetts trap/pot fishery could not secure a negligible impact determination.**

Finally, even if NMFS were to backpedal on its directive that "fisheries should not be redefined . . . for purposes of making a negligible impact determination," and designate Massachusetts its own fishery based on its current regulation, NMFS still could not grant Massachusetts a NID.

Since the 1994 amendments to the MMPA, NMFS has never made a negligible impact determination under § 101(a)(5)(E) with respect to the North Atlantic right whale.[729] At trial, the Commonwealth adduced no evidence proving that it will be able to secure an NID from NMFS.

To the contrary, all evidence—including the concessions in the 2021 BiOp[730]—show that trap/pot fishing in state waters will continue to seriously injure and kill North Atlantic right whales well above negligible limits. As previously explained, the default calculation for negligible impact determinations is 13% of the PBR.[731] PBR for the North Atlantic right whale is currently 0.8.[732] Therefore, to obtain a NID, Massachusetts would have to show that its fishery causes no more than 0.104 (0.8 x 0.13) SI/M to North Atlantic right whales per year. But NMFS's BiOp estimates that even with all the new regulations in place, state fisheries will cause 0.61 SI/M to

[729] *See supra* ¶ 167.

[730] The BiOp predicts that implementation of the ALWTRP proposed rule change will reduce the current number of entanglement-caused SI/M in *state* fisheries to North Atlantic right whales by 2.39 whales, resulting in an estimated annual average of 0.61 SI/M. *See supra* ¶ 294.

[731] *See supra* ¶ 43.

[732] *See supra* ¶ 84.

North Atlantic right whales per year.[733] And this estimate says nothing of the sublethal and moderate injuries entanglements will cause to right whales in state waters—injuries that constitute takes under the ESA and MMPA.[734] Without a move to ropeless, a separate Massachusetts fishery could not secure an NID.

Furthermore, the May 2021 DST runs that DMF requested from NMFS cannot support a negligible impact determination. These runs state the obvious: that risk to whales in Massachusetts waters decreases during the closure months.[735] Yet whales continue to swim in Massachusetts waters outside this closure period[736] and whales have been entangled in Massachusetts despite its implementation.[737] And the DST estimates are insufficiently precise to justify an NID to Massachusetts. As previously explained, the "Final Relative Risk Score" for the month of December has a lower bound of 6.4% and an upper bound of 73.9%, with a 95% confidence interval.[738] These runs therefore provide no real reassurance that Massachusetts regulations will prevent takes. Therefore, this time limit closure period is insufficient prevent more than 0.104 SI/M to right whales in Massachusetts waters per year.

[733] *See supra* ¶ 294.

[734] *See supra* Section IV.B.1.

[735] *See supra* ¶ 298.

[736] *See supra* Section III.B.

[737] *See supra* Section North Atlantic right whales are entangled in Massachusetts waters.

[738] *See supra* Section ¶ 300.

Dated: September 17, 2021

Respectfully submitted,

/s/ Thomas M. Sobol

Thomas M. Sobol (BBO #471770)
Hannah W. Brennan (BBO #688179)
Rachel A. Downey (BBO #706639)
Laura Hayes (BBO #673986)
HAGENS BERMAN SOBOL SHAPIRO LLP
55 Cambridge Parkway, Suite 301
Cambridge, Massachusetts 02142
Telephone: 617-482-3700
Facsimile: 617-482-3003
tom@hbsslaw.com
hannahb@hbsslaw.com
racheld@hbsslaw.com
lhayes@hbsslaw.com

Adam Keats
LAW OFFICE OF ADAM KEATS, PC
303 Sacramento St., 2nd Floor
San Francisco, CA 94111
Telephone: 415-430-9403
adam@keatslaw.org

*Counsel for Plaintiff Man Against Xtinction ("MAX") a.k.a. Richard Max Strahan*

**CERTIFICATE OF SERVICE**

I, Thomas M. Sobol, certify that, on this date, the foregoing document was filed electronically via the Court's CM/ECF system, which will send notice of the filing to all counsel of record, and parties may access the filing through the Court's system.

Dated: September 17, 2021

/s/ Thomas M. Sobol
Thomas M. Sobol