The Lobster Fishing Associations

Maine Lobstermen's Association	Maine Coast Fishermen's Association	Maine Lobster Dealers Association
Massachusetts Lobstermen's Association	New Hampshire Commercial Fishermens' Association	Maine Center for Coastal Fisheries
Atlantic Offshore Lobstermen's Association	Downeast Lobstermen's Association	Maine Aquaculture Association
Maine Lobstering Union	Southern Maine Lobstermen's Association	O'Hara Corporation

February 19, 2021

Via Email to nmfs.gar.fisheriesbiopfeedback@noaa.gov

Paul N. Doremus, Ph.D.
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NOAA Fisheries
1315 East-West Highway
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Silver Spring, MD 20910

Re: Comments of the Lobster Fishing Associations to the *Draft Biological Opinion on 10 Fishery Management Plans in the Greater Atlantic Region and the New England Fishery Management Council's Omnibus Habitat Amendment 2* (Released January 15, 2021)

Dear Dr. Doremus:

Thank you for the opportunity to comment on the above-referenced draft Biological Opinion ("Draft BiOp") released on January 15, 2021. The following comments are submitted on behalf of the Maine Lobstermen's Association, the Massachusetts Lobstermen's Association, Atlantic Offshore Lobstermen's Association, New Hampshire Commercial Fishermens' Association, Maine Coast Fishermen's Association, Maine Lobstering Union, Downeast Lobstermen's Association, Southern Maine Lobstermen's Association, Maine Lobster Dealers Association, Maine Center for Coastal Fisheries, Maine Aquaculture Association and the O'Hara Corporation (collectively, the "Lobster Fishing Associations" or "Associations"). While the extremely short comment period has not allowed for as thorough a response as this lengthy and complex document warrants, we appreciate the National Marine Fisheries Service's ("NMFS") consideration of these comments, which we provide in the spirit of refining and improving the Draft BiOp to present an accurate assessment of the proposed actions consistent with the standards of Section 7 of the Endangered Species Act ("ESA").[1]

[1] In a letter dated February 5, 2021, the Associations requested a 10-day extension of the comment period for the Draft BiOp to align with the public comment period on the proposed Atlantic Right Whale Take Reduction Plan rule that is concurrently posted for public review and comment ("Proposed TRP Rule"). *See* 85 Fed. Reg. 86,878 (Dec. 31, 2021). Similar requests were made by the State of Maine, Atlantic States Marine Fisheries Commission, and Maine's Congressional delegation. NMFS regrettably denied the requests. The Associations appreciate that NMFS is working against a litigation deadline, but its denial of a modest 10-day extension request to allow stakeholders to coordinate their comments on two inextricably linked regulatory proposals that could fundamentally alter the management, operational integrity, safety, and financial viability of the fisheries is unreasonable. The Lobster Fishing Associations strongly encourage NMFS to consider the comments submitted on the Proposed TRP Rule as it revises and finalizes the BiOp.

I. THE LOBSTER FISHING ASSOCIATIONS HAVE STRONG INTERESTS IN THE FUTURE OF THE NORTHEAST LOBSTER FISHERY AND SURVIVAL OF THE NORTH ATLANTIC RIGHT WHALE

The Lobster Fishing Associations represent members who are active participants in the U.S. Northeast Lobster Fishery (the "Lobster Fishery") or who are otherwise active in businesses and organizations directly connected to the extraordinary marine resource that makes up the Lobster Fishery. A description of each association's membership, mission and interest in this proceeding is presented in Addendum A.

The Lobster Fishing Associations share a commitment to support the continued viability of the Lobster Fishery under principles of sound resource management that promote sustainability and ensure best practices for the protection and conservation of all marine resources in the area. They are also dedicated to an effective management plan incorporating practices and measures built upon the best available commercial and scientific data that supports the health of the endangered North Atlantic right whale ("NARW").

As professionals with a deep understanding of our ocean environment, we have specialized knowledge, experience and perspective to inform this issue. We draw our livelihoods from the ocean and recognize the fragility of our shared marine environment. Our fisheries have been well-managed by generations of fishermen who feed our nation with healthy, sustainably harvested seafood.

The Northeast Lobster Fishery has long been an integral part of the region's culture, heritage and economy supporting tens of thousands of jobs and hundreds of ancillary businesses.[2] The fishery remains the most valuable in the United States value at more than $640 million in 2019 and contributing more than $2 billion to the region's economy[3]. For rural coastal communities, the lobster fishery is the economic engine that keeps many small towns alive as detailed in Addendum B.

These comments focus only on those portions of the Draft BiOp relevant to interactions between NARWs and anthropogenic sources. As summarized in Section II below and set forth in detail in Section III, these comments identify significant questions and concerns associated with the data and analyses presented in the Draft BiOp. Our comments present recommendations for additional data and analyses to be considered and undertaken by NMFS in order to ensure accurate identification and analysis of the relative risk to the species and the associated application of Section 7(a)(2) of the ESA.

The Draft BiOp has profound implications for the future of the Lobster Fishery. It is therefore essential that the Final BiOp issued by NMFS comprehensively and accurately considers all of the best available scientific and commercial data, and correctly applies Section 7(a)(2)'s standards. With these comments, we seek to ensure that the Final BiOp presents a

[2] Maine's lobster fleet directly supports more than 10,000 jobs (3,670 captains, up to 5,750 crew, and 1,095 students).

[3] Donihue, Michael. Lobsters to Dollars: The Economic Impact of the Lobster Distribution Supply Chain in Maine. June, 2018.Colby College at http://www.colby.edu/economics/lobsters/Lobsters2DollarsFinalReport.pdf.

defensible assessment of the reasonably certain effects of the proposed actions and addresses actual sources of harm credibly identified and supported by verifiable scientific observations, data and analysis.

It is of paramount importance to the Associations that the Final BiOp meets these standards because our members will be asked to implement any additional measures. Such measures must be plainly demonstrated—based on the best scientific and commercial data available—to promise positive benefits for the NARW population so that the Associations' members will have confidence that any additional sacrifices are worthwhile.

II. SUMMARY OF COMMENTS

The Draft BiOp is an expansive document with far-reaching implications for New England's iconic fisheries and cultural heritage. The Associations are alarmed that NMFS has developed a BiOp that assigns highest priority for NARW population recovery to the Lobster Fishery despite evidence that the most urgent risks are vessel strikes and entanglements in Canadian fisheries, which do not implement mitigation measures nearly as protective as those undertaken by the Lobster Fishery. The relative risks presented by the Lobster Fishery—which have already been substantially mitigated over the last decade—do not justify unsupported agency mandates that could eliminate an economic and fishing heritage that has sustained our coastal communities for centuries and is an integral part of New England's identity.

With that said, the Associations remain committed to working with NMFS and other stakeholders to design an effective program for avoiding and minimizing impacts to the NARW population. We have carefully reviewed the Draft BiOp and provide detailed comments in Section III below, which are summarized as follows:

1. The Lobster Fishery has substantially reduced the risk it presents to NARWs over the past decade through implementation of risk reduction measures. The best available data shows that those measures have been effective, and the Final BiOp's environmental baseline should fully reflect the benefits of such measures. The Associations encourage NMFS to focus on implementing *effective* measures in areas where there is demonstrated risk. In particular, ropeless gear is not economically viable at this time and there are numerous technical and operational challenges that must be addressed before it can be substituted for gear using vertical lines, as explained in greater detail below.

2. NMFS should not be considering a management strategy that holds U.S. fishermen accountable for NARW M/SI in Canada. The U.S. must engage directly with Canada in an open and transparent manner. The Associations implore NMFS to engage more directly and aggressively with Canada to ensure that effective and measurable risk reductions are implemented bilaterally.

3. The Draft BiOp presents an inaccurate assessment of the effects of the Lobster Fishery by relying upon unsupported assumptions that artificially inflate the risk from the Lobster Fishery. The result is that the Draft BiOp does not present an effects scenario that is "reasonably certain to occur" or supported by the best scientific and commercial data available.

a. NMFS arbitrarily assigned a level of risk to the Lobster Fishery that is unsupported by the evidence. NMFS must correct this flaw by adopting a uniform probabilistic approach, based on observed data, to apportion all unknown human causes. Additional data, information and expert judgment should be used to refine risk allocation and adapt the proposed management program. This methodology should apply to apportionment of (1) unknown human causes to vessel strikes versus entanglements, (2) unknown entanglements between U.S. and Canada, and (3) unknown entanglements among U.S. fisheries.

b. NMFS based the "North Atlantic Right Whale Conservation Framework for Federal Fisheries in the Greater Atlantic Region" ("Conservation Framework") on an unreliable model that arbitrarily ignored sublethal impacts. In doing so, it failed to capture the full benefits from mitigation requirements under Phase 1.

c. NMFS arbitrarily selected data from the 2010-2019 time period. It assumed that unfavorable trends in oceanographic conditions would continue but did not take a similar approach with favorable trends in observed data on the sources of entanglements. These latter trends demonstrate disproportionately more entanglements due to Canadian fisheries and, in the U.S., more entanglements from non-trap/pot gear. Nonetheless, NMFS allocated more mortality and serious injury ("M/SI") incidents to the Lobster Fishery than is supported by the best available information.

d. The estimate for cryptic mortality is not reliable. This estimate, based on the Pace *et al*. model (2017), is highly sensitive to new data and therefore, given the foreshortened time frame on which it relies, not suitable yet for long-term planning. Further, these models assume no natural mortality despite well-established research to the contrary.

e. NMFS failed to give appropriate weight to mitigation measures that reduce the severity of entanglement (*e.g.*, weak links). These measures may substantially reduce or eliminate risks from trap/pot fisheries, based on published scientific literature.

f. The Decision Support Tool ("DST") assigns equal weight to whale density, gear density, and gear type even though reviewers believe that whale behavior and gear type/configuration are the most relevant factors in determining entanglement risk. We suggest both approaches be evaluated.

4. Phases 3 and 4 of the Conservation Framework are likely unnecessary once NMFS performs a more robust and accurate assessment of the effects of the action. We recommend that NMFS undertake a comprehensive assessment of Phases 1 and 2 that includes the participation of the states and the fisheries to ensure that the process is fully informed by the best scientific and commercial data available. The assessment should be reviewed by the Center for Independent Experts ("CIE"). This will inform whether Phases 3 and 4 are necessary and, if so, how they should be modified.

5. The Conservation Framework's benchmark of 0.11 M/SI is arbitrary and unsupported by the best available science or the law. NMFS provides no explanation supporting this metric or an explanation of how it was calculated. In any event, a "jeopardy" determination under Section 7(a)(2) of the ESA does not turn on a single metric, much less one that is far more stringent than would be required to achieve the more protective goals of the Marine Mammal Protection Act ("MMPA"). NMFS's requirement that the M/SI rate "needs to be reduced" to 0.11 to achieve a "no jeopardy" determination has no precedent in the law or practice, and arbitrarily demands a result that exceeds the requirements of both the ESA and the MMPA.

6. It is unclear how NMFS intends the Conservation Framework to be implemented through, or in conjunction with, the two primary sources of authority that govern the ongoing federal regulation of the Lobster Fishery—*i.e.*, the Atlantic Coastal Fisheries Cooperative Management Act ("ACFCMA") and the MMPA. These statutory processes should be integrated into the Conservation Framework.

7. We offer a number of specific recommendations for refinement and improvement of the Draft BiOp's reasonable and prudent measures and associated terms and conditions. These are set forth in Section III.E below.

III. COMMENTS ON DRAFT BIOLOGICAL OPINION

A. The Lobster Fishery Has Significantly Reduced Risk to the NARW.

NMFS initiated the Section 7 consultation leading to the Draft BiOp against the backdrop of an unusual mortality event ("UME") declared in mid-2017 that tragically interrupted a prolonged period of improvement in the prospects for recovery of the NARW. The population growth trajectory had been favorable for many years under the guidance of the Atlantic Large Whale Take Reduction Team ("TRT") and the associated Atlantic Large Whale Take Reduction Plan ("ALWTRP") implemented by NMFS pursuant to Section 118(f) of the MMPA. Collaborative work by lobster harvesters, researchers, fishery managers, and other stakeholders had contributed to scientific knowledge of NARW behavior and interaction with fishing gear and other human activities across its migratory range.[4] This work led to a series of enhanced measures to mitigate risk to the species from fishing gear. In addition, harvesters worked alongside fishery regulators, whale scientists, and the private sector to develop

[4] The MLA and its members have collaborated with scientists in developing and testing fishing gear to reduce the risk of entanglement. The MLA partnered with the NMFS gear team in the 1990s to measure gear profiles, test weak links and explore gear modifications; worked with researchers in the 2000s to establish methods and standards to deploy weak links, develop buoy line marking methods, deploy remotely operated vehicle ("ROV") and sensors to measure groundline rope profiles, and tested a variety of vertical line modifications such as weak rope, stiff rope, glow rope and time tension line cutters. Since 2010, MLA and its members have worked with scientists to publish a resource describing lobster gear and configurations deployed in the New England lobster fishery, map lobster fishing effort, develop a fishing gear/right whale risk model, document wear issues associated with sinking groundlines and recommendations to improve wear of that line, describe options for best fishing practices, test colored vertical lines, measure the breaking strength of existing vertical lines, test new versions of weak rope and update time tension line cutters. In addition, individual MLA members have collaborated with researchers and developers seeking to design a viable system for ropeless fishing.

innovative fishing practices and gear deployment strategies intended to reduce harmful interactions between whales and fishing gear. [5]

The Associations have been key participants in the TRT process, helping to develop and successfully implement enhanced protections for NARW with demonstrated success.[6] Since 2009, a robust new regulatory environment has significantly reduced the risk of NARW entanglement in American lobster fishing gear by implementing a comprehensive overhaul in gear configuration and fishing practices over the past 10 years. Regulations developed and imposed at the state and federal level, including those implemented under the ALWTRP, have significantly reduced both (1) the amount of lobster fishing gear on the water, and (2) the risk of a severe outcome if a NARW encounters such gear. The principal elements of the enhanced measures that have been implemented to protect whales are summarized below.

- Sinking groundline requirement. Implemented under ALWTRP in 2009, these regulations preclude the use of "floating groundlines" connecting lobster traps and, instead, require the use of "sinking groundlines." This eliminates the potential for whale entanglement in floating lines near the ocean bottom. These regulations removed over 27,000 miles of floating groundlines from New England waters.[7]

- Vertical line reduction. Implemented under ALWTRP in 2014, these regulations establish minimum traps per trawl based on geographic area and distance from shore, resulting in the removal of approximately 2,740 miles of rope from the water.

- Massachusetts Restricted Area. In 2015, ALWTRP regulations established a 3,000 square mile area spanning Cape Cod Bay, Massachusetts Bay, and outer Cape Cod, which has been closed to lobster gear from February 1 to April 30 annually. The state waters portion of this closure is managed by the Massachusetts Division of Fisheries ("DMF"), which has extended applicability to recreational fishermen and moved the closure date beyond April 30 as appropriate.

- Universal Gear Requirements. A suite of gear modifications has been established to reduce entanglement risk to NARW, prohibiting the use of floating line at the surface and

[5] MALA works cooperatively with the Massachusetts Division of Marine Fisheries ("DMF") in efforts to further reduce risk of entanglement to NARWs. Among other things, MALA is partnering with the Lobster Foundation of Massachusetts ("LFoM") and the DMF on an effort to field test 1700lb weak red rope to further reduce interactions with NARWs and vertical lines. The LFoM and MALA worked to distribute over 700 coils of the 1700lb weaker red rope to lobstermen in Massachusetts to be field tested during the 2020 fishing season. The goal is to acquire viable and acceptable "weak contrivance" options to be off-the-shelf ready for implementation in the 2021 fishing season in Massachusetts.

[6] The Associations have been actively involved in the TRT process. TRT members include MLA's Executive Director, Patrice McCarron (more than 15 years); MLA President and commercial fisherman, Kristan Porter; MALA Executive Director, Beth Casoni; MALA President, Massachusetts Marine Fisheries Commissioner, and commercial fisherman, Arthur Sawyer; AOLA Executive Director, David Borden; NH Commercial Fishermen's Association member and lobsterman, Bob Nudd, Jr.; and Association members who are commercial lobstermen Dwight Carver, John Williams, and Mike Sargent.

[7] The Salvador Declaration, which was filed in *Ctr. for Biological Diversity v. Ross*, Civ. Action No. 18-CV-112-JEB, as Document 115-5 at 5 (D. D.C., filed June 18, 2020). (Addendum C).

wet storage of gear for more than 30 days, and requiring the incorporation of weak links in the top of buoy line and to any attachments along the buoy line. Federally regulated fixed gear fishermen are required to mark vertical lines to aid in identifying the source of gear involved in an entanglement. In 2020, Maine implemented new regulations to require unique and expanded gear markings.

- Effort Reduction. The Lobster Fishery has reduced effort across all jurisdictions since the inception of the ALWTRP. Area 3 has implemented mandatory annual trap allocation limits of 5% per year, Massachusetts has a long-standing moratorium on lobster licenses, and Maine has established a limited-entry program, all of which has resulted in a significant reduction in the risk of entanglement to NARWs.

Table 1 **Confirmed U.S. Lobster Entanglement 1997-2019**		
1997-2000	2000-2010	2010-2019
4 Non-serious injuries	1 Mortality; 4 Non-serious injuries	1 Non-serious injury

As illustrated in Table 1, continuous enhancements of whale protective measures have been followed by significant declines in NARW entanglements attributed to American lobster fisheries. From 2000 to 2010, U.S. lobster gear comprised 45% of known cases of such entanglements (6 cases out of 13). However, since 2010, U.S. lobster gear comprises only 0.04% of known cases (1 case out of 25).[8] Since 2014, there has been only one entanglement (a non-serious injury) in New England lobster gear. During this same time period, no NARW is known to have died or suffered serious injury arising from entanglement in gear attributed to American lobster fishing.[9] This is significant since efforts to monitor and study NARW, including expanded survey effort and NARW health status, have substantially improved since the beginning of the TRT process so the likelihood of detection and identification of sources of harm has improved.

In sum, the best available scientific and commercial data demonstrate that since the implementation of additional protective measures by American lobster fishermen through the MMPA's take reduction planning process, the Lobster Fishery has significantly lowered the risk profile of its gear and fishing practices to the extent they interact with NARW. Although the Draft BiOp acknowledges that "risk reduction measures implemented in U.S. fisheries over the past two decades have reduced impacts to NARW from U.S. fisheries,"[10] the benefits of such measures have not been accounted for, as they must, in the environmental baseline.[11] This

[8] Salvador declaration at 8 (Addendum C).

[9] *Id.*

[10] Draft BiOp at 224.

[11] *See* 50 C.F.R. § 402.02 ("The environmental baseline includes the past and present impacts of all Federal, State or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process."); ESA Consultation Handbook at 4-22 (Environmental baseline should incorporate actions that may benefit the species.).

sustained downward trend in observed entanglements with Northeast lobster gear, attributable to the comprehensive actions taken by fishery regulators and harvesters to minimize and avoid entanglements, is a significant feature of the environmental baseline that cannot be arbitrarily dismissed or overlooked.[12]

The Final BiOp will not accurately analyze the risk of adverse interactions between NARW and lobster gear unless it clearly identifies and considers: (1) the documented reduction in observed incidents of entanglements with lobster gear since 2010, and (2) the absence of any incidence of M/SI from such entanglements during that time period. Although entanglement continues to be a significant factor affecting NARW, NMFS's most recent data as presented in the Draft BiOp show that, from 2010-2019,18 cases (16%) of known entanglements were attributed to Canada (18% M/SI) and only 8 cases (7%) were attributed to the US (4% M/SI). The trend shifts significantly during the last four years of this time series with 16 cases (33%) attributed to Canada (39% M/SI) and only 3 cases (6%) attributed to U.S. (0% M/SI). The percent of unknown entanglements over these four years declined by 61% compared to 77% over the last ten years.[13]

As discussed in more detail below, the performance of Canadian fisheries since 2010 has been troublesome, with a spike in observed entanglements in recent years. A failure to appropriately consider the increasing trend in incidents occurring in Canada will result in an arbitrarily high assignment of risk to the Lobster Fishery. The consequences of an inaccurate risk assignment are non-trivial. The species is experiencing a UME that started in 2017 and recent scientific observations report declines in species population health status.[14] This places a premium on accurate identification and assessment of sources of harm to NARW so that limited conservation resources are effectively deployed. The Final BiOp should include a probabilistic analysis of the relative risk posed by lobster fishing gear and other gear types that have been identified in entanglement and M/SI incidents over the last decade, as well as relative difference between Canadian and U.S. fishery risk.

B. The Draft BiOp Arbitrarily and Substantially Overestimates the Impact of the Lobster Fishery.

1. The BiOp must present an *objective* assessment of the "reasonably certain" effects of the action, based upon the best available scientific and commercial information.

Section 7 of the ESA requires NMFS to use the "best available scientific and commercial information" when developing a BiOp. 16 U.S.C. §1536(a)(2). The "obvious purpose" of this

[12] NOAA law enforcement has reported excellent compliance rates with fishery regulations, including measures required by ALWTRP. *See, e.g.,* https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/October%202018/noaa_fisheries_enforcement_presentation.pdf (Compliance rates for all fisheries 92% in 2017).

[13] Draft BiOp, Table 56 at 223.

[14] While there are likely a multitude of factors involved, low calving has been linked to poor female health (Rolland *et al*. 2016) and reduced prey availability (Devine *et al*. 2017, Johnson *et al*. 2017, Meyer-Gutbrod and Green 2014, Meyer-Gutbrod and Greene 2017, Meyer-Gutbrod *et al*. 2018). Draft BiOp at 94-95.

requirement "is to ensure that the ESA not be implemented haphazardly, on the basis of speculation or surmise," particularly when doing so would cause "needless economic dislocation." *Bennett v. Spear*, 520 U.S. 154, 176 (1997). Relatedly, although the ESA's legislative history suggests that a federal agency, when faced with uncertain data, should give the "benefit of the doubt" to the species, that concept does not excuse NMFS from its obligation to objectively evaluate the "effects of the action," that are "reasonably certain to occur." 50 C.F.R. § 402.02; *see* 84 Fed. Reg. 44,976, 44,993 (Sept. 26, 2019) ("'reasonably certain to occur' determination must be based on clear and substantial information, using the best scientific and commercial data available" and is not altered by the "benefit of the doubt" concept); *see id*. at 45,007. The "benefit of the doubt" concept does "not absolve federal agencies from . . . developing adequate information on which to base a biological opinion." *Miccosukee Tribe of Indians of Fla. v. U.S.*, 566 F.3d 1257, 1267 (11th Cir. 2009), *quoting* H.R. Rep. No. 96-697, at 12 (Conf. Rep.), *as reprinted in* 1979 U.S.C.C.A.N at 2576.

At numerous points in the Draft BiOp, when faced with uncertainty, NMFS selects the variable at the extreme end of a spectrum of choices that assumes the greatest possible impact from the Lobster Fishery on the basis that it must give the "benefit of the doubt" to the species. Many such precautionary assumptions, when compounded throughout the modeling analysis, result in a substantial overestimation of the effects of the Lobster Fishery that is *not* "reasonably certain to occur." This is not how Congress or the Services intended the "benefit of the doubt" concept to apply. The concept applies only to NMFS's overarching determination as to whether an action is likely to jeopardize (after *objectively* evaluating the "effects of the action") and "suggests only that agencies, including the Service, cannot hide behind uncertain scientific data to shirk their duties under the Act." *Miccosukee Tribe*, 566 F.3d at 1267; *see Conner v. Buford*, 848 F.2d 1441, 1454 (9th Cir. 1988) (agency may not "ignore available biological information"). The "benefit of the doubt" concept does not permit or compel NMFS to construct implausible effects scenarios built upon compounded precautionary assumptions, as it has done in the Draft BiOp. The Draft BiOp's key errors in this regard are addressed in the following sections.

2. The Draft BiOp does not evaluate reasonably certain sublethal effects, resulting in a substantial overestimate of the effects of the proposed actions.

Phases 3 and 4 of the Draft BiOp's Conservation Framework are predicated on NMFS's assumption that implementation of Phases 1 and 2 will be insufficient to avoid jeopardizing the existence of the NARW. The population model described in Linden (2021)[15] is an important basis for this finding, as it projects a declining NARW population even after implementation of all four phases of the Conservation Framework under Scenario 2. Phases 3 and 4 are also based on the qualitative understanding that "[the] operation of the federal fisheries is likely to contribute to decreased calving rates due to the sublethal effects."[16] The Draft BiOp notes that "some of the risk reduction measures in Phase 1 and 2 are designed to *reduce the severity of entanglements and not the likelihood*" (emphasis added), implying both are necessary. The Draft

[15] Linden, D.W. January 9, 2021. Population projections of North Atlantic right whales under varying human-caused mortality risk and future uncertainty. Greater Atlantic Region Fisheries Office. *See* section 7 below for additional comments on Linden (2021).

[16] Draft BiOp at 338.

BiOp goes on to explain that the "risk reduction requirements in Phase 3 and 4 of the Framework" are necessary to address assumed sublethal effects to NARW.[17]

The imposition of additional risk reduction requirements in Phases 3 and 4 to address non-lethal effects is problematic in two ways. *First*, the Draft BiOp does not quantify sublethal impacts but rather discusses them qualitatively and makes no effort to further investigate the potential magnitude of these effects based upon the best available science. Most NARW that become entangled apparently clear themselves of the gear although they continue to bear scars after they recover from the direct effects of the encounter.[18] A total of 63 percent of entanglements are minor in severity when they occur,[19] but the BiOp notes that "[t]he sublethal stress of entanglements can have a serious impact on individual health and reproductive rates (Lysiak *et al*. 2018, Pettis *et al*. 2017, Robbins *et al*. 2015)."[20] The Draft BiOp cites no scientific literature that allows for a population-level understanding of sub-lethal impacts.[21] Yet, Phases 3 and 4 still impose numerical risk reduction to address an impact that is not shown by clear and substantial evidence to be reasonably certain to occur.

Second, Linden (2021) does not incorporate sub-lethal impacts in its model.[22] It states:

> The projection outputs do not consider any increase in the female right whale population trajectories due to a reduction in sublethal effects (i.e., ALWTRP proposed rule, any future risk reduction measures). The reduction of sublethal effects expected from reducing entanglements is expected to improve the animal's heath and reproductive capacity. However, these reductions cannot be quantified as they are confounded by other stressors (e.g., environmental factors).

The consequence of not considering improvements in the condition of NARW from fewer overall entanglements and fewer severe, non-lethal entanglements as a result of Phase 1 and 2 measures (and by extension an enhanced calving rate of NARW) is that the population

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[17] *Id*. at 338-339.

[18] Knowlton, A.R., P.K. Hamilton, M.K. Marx, H.M. Pettis and S.D. Kraus. 2012. Monitoring North Atlantic right whale *Eubalaena glacialis* entanglement rates: a 30 year retrospective. Mar. Ecol. Prog. Ser. 466:293–302.

[19] Maintenance of the North Atlantic Right Whale Catalog, Whale Scarring and Visual Health Databases, Anthropogenic Injury Case Studies, and Near Real-Time Matching for Biopsy Efforts, Entangled, Injured, Sick, or Dead Right Whales October 1, 2020 at 50.

[20] Draft BiOp at 146.

[21] "However, at this time, there is no further evidence to make the conclusion that sublethal effects from fishing gear entanglement alone causes a decline in large whale health. Based on the best available scientific and commercial data, we believe at least some of the observed variability in right whale calving rates is due to the sublethal effects of entanglements in U.S. federal fishing gear, but cannot quantify the degree to which entanglements are affecting calving rates at this time." Draft BiOp at 221.

[22] *Id*. at 331.

model *underestimates* the stock size under all three scenarios.[23] The Draft BiOp acknowledges this problem: "All scenarios are expected to result in an increase in calving. This increase is not considered in the population projections, therefore, the three scenarios representing the implementation of measures to reduce M/SI are conservative."[24] One independent reviewer went further in her characterization, stating that Linden 2021 presents "overly pessimistic conclusions" and that the absence of a quantified relationship between fecundity and entanglement represents a "worst case scenario."[25] But the Draft BiOp does not provide any further analysis to address the problem.

The overwhelming majority of entanglements are non-lethal, and they are either important with respect to demographic rates or they are not. If sublethal impacts are important to the point that the Draft BiOp imposes draconian risk reduction requirements in Phases 3 and 4 of the Conservation Framework, then the analysis must fully consider sublethal impacts in the population model upon which these additional phases are predicated. And there is available scientific information (some of which is cited in Linden 2021) that confirms sub-lethal impacts occur. Taking sublethal impacts into account in the model would likely generate different results where calving rates improve and the population is growing under the Conservation Framework. In fact, the Linden (2021) population model appears to be sensitive to calving rates, with the author noting that "using a calving rate averaged across the years 1990-2018 produces positive population trajectories under all three scenarios."[26] [27] It goes on to state:

> Finally, the population model does not consider the relationship between entanglement injuries and calving probability (Pettis et al. 2017). It is possible that mitigation measures aimed at reducing the risk of entanglement mortality would also reduce sub-lethal entanglements to reproductive adult females that may be partially responsible for suppressed calving rates in recent years. Thus, *the scenarios represented here may be underestimating the benefits of risk reduction to the population by focusing only on mortality*. [Emphasis added.]

The Draft BiOp expressly recognizes that its treatment of sub-lethal effects underestimates population growth.[28] But where, as here, available data can be used to further evaluate this effect and address the flawed underestimate, NMFS must carry out that analysis because it must evaluate effects that are "reasonably certain to occur." *See* Section III.B.1 *supra*.

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[23] *Id*. at 333-335 and 341.

[24] *Id*. at 340.

[25] L. New. May 2020, at 2. Center for Independent Experts (CIE) External Independent Peer Review for "predictive Modeling of North Atlantic Right Whale Population.

[26] Linden (2021) at 9.

[27] *Id*., *see* Figure 2, Draft 2020 Status Assessment Report, growth rate of 2.8 percent for years 1990-2011, whereas the overall decline in abundance between 2011 and 2018 was 14.35% (CI=11.67% to 16.6%). *Id*. at 46.

[28] "We expect calving rates will likely improve following the implementation of the Framework as sublethal effects will be reduced. Calving rates are also likely to improve at a similar rate in the no federal fisheries scenario. It is likely that both projections are an underestimate, and the right whale population would fare better than population projections indicate." Draft BiOp at 341.

If NMFS were to perform this analysis and it indeed shows a more favorable population trajectory under Scenario 2, NMFS may determine that additional risk reduction in Phases 3 and 4 is either unnecessary or can be scaled back from what is currently proposed.

Similarly, if sub-lethal impacts are determined to be insignificant to the population growth trajectory, then the focus of the Conservation Framework should be on actions that specifically reduce the severity of entanglement events. Despite NMFS's worst-case modeling scenarios, the agency recognizes that "the population is capable of recovering at lower levels than the current estimate," referring to NARW abundance estimates of 162 animals in 1980 and 270 animals in 1990, figures that ultimately grew to 483 whales in 2010 (Pace *et al*. 2017).[29]

In short, Phases 3 and 4 are not premised on a complete analysis of the best available scientific data. Performing a complete analysis, as outlined above, would inform both (1) whether Phases 3 and 4 are necessary and (2) if so, how risk reduction measures in Phases 3 and 4 should be targeted. Moreover, implementation of Phases 3 and 4 should be predicated on a review of the effectiveness of Phases 1 and 2 in reducing the severity of entanglements. As it currently stands, the Conservation Framework, on one hand, imposes a severe quantitative risk reduction requirement at Phases 3 and 4 to, in part, address an uncertain variable (sub-lethal effects) and, on the other hand, ignores that same variable despite acknowledging that conservation measures would improve sub-lethal effects. This arbitrarily inflates the effects of the action beyond what is "reasonably certain to occur."

3. The best available science demonstrates that more entanglements are occurring in Canadian fisheries.

The Draft BiOp allocates half of all entanglements of unknown origin to U.S. fisheries. This determination is one of the most significant assumptions in the Draft BiOp because 96% of all mortality attributed to the commercial trap/pot fishery is the result of fishing gear of unknown origin. The Draft BiOp justifies this allocation with the following rationale:

> Although right whales spend more time in U.S. waters than Canadian waters, for the purposes of this Opinion, we assume that 50% of the observed right whale entanglements where the country of origin is unknown occurred in the United States. This assumption is supported by the analysis of recovered entangling gear. The heavy traps and large diameter, high breaking strength lines used to target snow crabs in Canada are more lethal than most U.S. fishing gear.[30] Additionally, risk reduction measures implemented in U.S. fisheries over the past two decades have reduced impacts to right whales from U.S. fisheries.[31]

[29] Draft BiOp at 340.

[30] The fact that Canadian fishing gear is observed to be more lethal than U.S. gear is supported by other data and analyses, including information provided in the Salvador Declaration at 5. However, the statement is inexplicably contradicted at page 96 of the Draft BiOp where it is stated that Canadian and U.S. lobster fisheries use similar gear. The latter statement is incorrect and should be removed or clarified because it is contrary to the weight of available evidence.

[31] Draft BiOp at 224.

The Draft BiOp goes on to identify several factors that were considered to determine the 50-50 allocation: (1) that NARW spend more time in U.S. versus Canadian waters; (2) the relatively higher number of fishing lines in U.S. waters; (3) the "heavy traps" and lethality of fishing gear used by Canadian snow crab fisheries; (4) the success of risk reduction measures implemented in U.S. fisheries; and (5) an analysis of recovered entangling gear. However, the Draft BiOp does not quantify or otherwise explain how these factors were weighted to reach a 50-50 allocation. A close look at these assumptions shows that NMFS's 50-50 allocation determination is not consistent with the best available scientific data, including NMFS's own data.

First, the Draft BiOp improperly discounts the value of observed data, noting that "[a]ssignment of an observed entanglement event to a specific fishery or country of origin *is rarely possible*."[32] In fact, NMFS's data show that this is not rare, with 39% of entanglement cases confirmed to a country from 2016 to 2019.[33]

Second, NMFS's assumption that *NARW spend more time in U.S. waters than Canadian waters* is not supported by the best available data. By NMFS's own admission, there are *no* data to substantiate the claim that NARW spend more time in U.S. versus Canadian waters.[34] Moreover, the amount of residency time in U.S. waters generally is irrelevant for the purpose of ascertaining the entanglement risk of commercial fisheries. NMFS should instead compare the time spent by NARW in the portion of U.S. waters *where a fishery operates*. Residency time in more southern locations is not indicative of the entanglement risk of the Lobster Fishery. We therefore encourage NMFS to look more closely at NARW *behavior* (*e.g.*, transiting vs. foraging) within areas where fishing gear is deployed because the nature of animal behavior across commercial fisheries is variable and is likely to be more relevant than residency time. This same concern was stated in the CIE review of the DST.[35]

Third, although the Draft BiOp acknowledges that the rapidly expanding Canadian snow crab fishery uses heavier and more lethal gear,[36] Canada had few, if any, risk reduction measures

[32] Draft BiOp at 223.

[33] Draft BiOp, Table 56.

[34] In GARFO's April 18, 2019 email to the TRT, introducing the 50:50 US/CN apportionment, GARFO states: "Because our Stock Assessment Reports have not included a determination on the fraction of time North Atlantic right whales spend in U.S. and Canadian waters, we do not have a data-based residency estimate to apply at this time." (see Coogan email in Addendum D)

[35] Peer Review Summary Report: Review of the North Atlantic Right Whale Decision Support Tool. December 2019.

[36] Draft BiOp at 224.

in place prior to 2017.[37] [38] Meanwhile, beginning in 20019, both U.S. fisheries and maritime transportation sectors implemented a series of regulatory enhancements in an effort to reduce NARW serious injury and mortality in U.S. waters,[39] but similar efforts were not undertaken by Canada at the time.[40] U.S. fisheries implemented additional measures in 2014 to reduce the number of vertical lines.[41]

As illustrated by Table 2, observed data demonstrate the lethality of Canadian snow crab gear. Out of 26 entanglements with confirmed origin of fishing gear since 2010, Canadian pot gear accounts for 16% of entanglement and 17% of M/SI. The last four years of the data show the true lethality of the gear when it accounts for 31% of known entanglement and 36% of M/SI.

Table 2
Summary of Entanglement Incidents – US-Canada Comparison

	2000-2019		2016-2019	
	Entanglement	MSI	Entanglement	MSI
All events	114	52	51	25
CN	18 (16%)	9 (17%)	16 (31%)	9 (36%)
US	8 (7%)	2 (4%)	3 (6%)	0 (0%)
Unknown	88 (77%)	41 (79%)	32 (63%)	16 (64%)
Source: Adapted from Draft BiOp, Table 56				

Although this difference is not statistically significant,[42] it is arbitrary to ignore the difference because there are underlying factors that strongly suggest a divergence between the two regions with respect to entanglement risk associated with differences in the fixed gear profiles used in each country.

A previous version of this data was provided to the TRT at its April 2019 meeting. At that time, investigations were still underway and not all of the Canadian cases had been identified. Further, the data contained several transcription errors that erroneously determined

[37] Examining Threats to the North Atlantic Right Whale, Committee on Natural Resources, Subcommittee on Water, Oceans, and Wildlife. March 7, 2019. At 26. C. Oliver noting coordination began in 2017. Available at https://www.congress.gov/116/meeting/house/109022/documents/CHRG-116hhrg35462.pdf.

[38] Not only is the risk from Canadian fishing gear improperly weighed, but the Draft BiOp does not include in the environmental baseline recent measures undertaken by Canada. Failure to do so results in a worst case scenario being analyzed in the jeopardy assessment of the draft BiOp at 333.

[39] See discussion of U.S. regulatory measures above at Section III.A.

[40] Although increased NARW migration into the Gulf of St. Lawrence was observed as early as 2015, Canadian regulators did not implement enhanced protective measures for vessels until 2017 and fisheries until 2018. See NARW sightings data at https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html.

[41] See Section III.A. above for a summary of the primary mitigation measures implemented in U.S. waters since 2009.

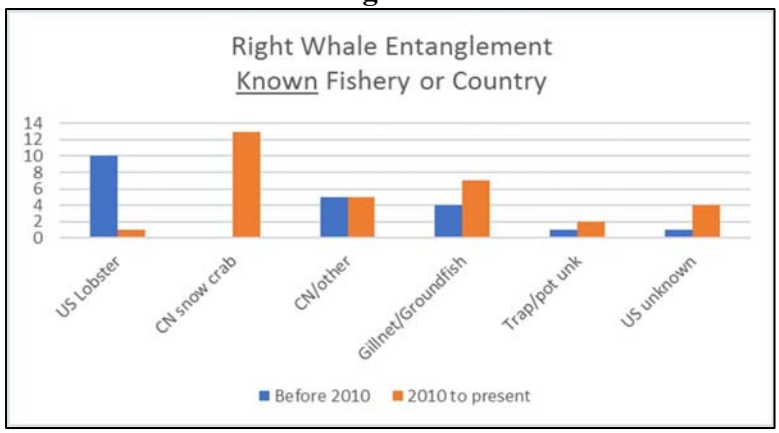
[42] Based on a Student's T-Test (2-tailed), the difference is not significant at $p < 0.05$. Walpole, Ronald E. (2006). Probability & statistics for engineers & scientists. Myers, H. Raymond. (7th ed.). New Delhi: Pearson.

confirmed non-trap cases as unknown. Based on this incomplete data, TRT members were instructed by NMFS to concentrate their efforts on reduction of entanglements from the Lobster Fishery because the fishery posed the most significant threat to the species, a claim that does not comport with observed data as described below.[43]

Glenn Salvador, who spent more than two decades as a gear specialist at NMFS, performed a careful examination of NMFS entanglement data, with updated Canadian cases and corrections included, and concluded that the April 2019 presentation does not accurately reflect the threat level presented to NARW by the American lobster fishery. [44] [45]

Specifically, Mr. Salvador reviewed data available for 138 documented entanglement cases in U.S. and Canadian fisheries of all types from 2000-2018, and concluded that there has been a significant decline in NARW entanglements in U.S. lobster gear since 2010. Moreover, he noted that since 2014 there has been only a single, non-serious entanglement in lobster gear attributed to the New England lobster fishery, and observed that rope removed from entangled whales since that time is not characteristic of ropes used in the New England lobster fishery.[46] Based on these findings, he concluded that "the decline in lobster gear entanglement is due to the success of whale protection measures implemented by lobstermen and a significant distributional shift of NARW into Canadian waters where they encounter Canadian fishing gear."[47] Mr. Salvador concluded that "[t]he largest entanglement threat is now posed by Canadian snow crab gear trap/pot gear."[48] The data supporting his conclusion are illustrated in Figure 1 below. As noted, updated data presented in the Draft BiOp show that this trend has worsened.

Figure 1



[43] *See* NMFS presentation at April TRT meeting at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/Meeting%20Materials/overview_of_relative_risk_reduction_decision_support_tool__04_23_201.

[44] Salvador declaration at 5 (Addendum C).

[45] pdf and additional meeting materials at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/01_april_2019_meeting_materials.html.

[46] *Id.*

[47] *Id.*

[48] Salvador declaration at 5 (Addendum C).

Mr. Salvador's analysis of data compiled and presented by NMFS also undermines NMFS's 50-50 risk allocation between Canada and the U.S., as proposed in the Draft BiOp. His analysis strongly supports a finding that, notwithstanding the significant volume of rope the U.S. lobster fishery deploys in the water column, Canadian fisheries now represent the greater entanglement threat to NARW.[49]

Fourth, the Draft BiOp does not address the difference in observation effort between Canadian and U.S. waters. Survey effort has historically been significantly greater in U.S. waters, as NMFS conducts aerial operations on nearly a year-round basis. As a result, entanglement events in Canadian waters were likely under-sampled prior to 2017, the year when survey effort in Canada was increased with the assistance of NMFS.[50] Greater survey effort in the U.S. relative to Canada increases the likelihood that an entanglement event would be observed. A small number of additional observed entanglements in Canadian waters would be sufficient to make the difference between the U.S. and Canada statistically significant. This factor also undermines the Draft BiOp's 50-50 allocation.[51]

Fifth, NMFS's peer review of this method did not provide conclusive advice on the allocation method. The report concludes:

> The current approach for apportioning human-caused mortality by country may not be the most appropriate approach. There has been a clear recent shift in the spatial distribution of NARW which has been coupled with a shift in the source of known serious injuries or mortalities to more Canadian records. Therefore, a different method from the 50:50 split of unknowns to US and Canadian fisheries should be examined. [52]

Reviewer Jason How acknowledged the lack of scientific basis for the 50-50 split and offered a different approach to address the uncertainty:

> The current 50% apportionment of unknowns to US fisheries does not reflect the current shift in NARW distribution and the recent increase in Canadian fisheries involvement in SI-M. Discussions between industry and government should therefore be entered into to find a compromise solution, whereby the recent shift in NARW abundance is accounted for, but fishers are still required to address

[49] Salvador declaration at 5, 8-10 (Addendum C).

[50] NMFS data presented at the October 2018 TRT meeting shows that while surveillance in Canada increased significantly in 2017 and was greater than U.S. efforts (95 hours in Northeastern US, 152 hours in CN), surveillance efforts were similar in 2018 (150 hours Northeastern U.S. vs. 152 hours in Canada).

[51] M. Cryer, CIE Independent Peer Review of the North Atlantic Right Whale Model Projects (May 2020), states the 50:50 split "does not seem to have much supporting evidence in the documentation provided" at 5.

[52] Peer Review Summary Report: Review of the North Atlantic Right Whale Decision Support Tool. December 2019, at 13.

> the SI-M issues which likely arise from their fisheries noting the large number of unknown SI-M which can't be attributed to a particular country.[53]

Finally, the Draft BiOp overemphasizes the quantity of vertical lines and insufficiently evaluates available data regarding the threat of different gear types and configurations. The Draft BiOp's cursory consideration of gear type is inconsistent with how it attempts to weigh these factors in the DST. Using a quantitative approach, the DST places equal emphasis on gear type and gear density in its calculations of entanglement risk.[54] Independent reviewers consistently noted the inherent challenge and problems with how the DST incorporated the risk of entanglement posed by various fishing gear types.[55] [56] [57]

Moreover, multiplying gear density by severity is merely an initial assumption that lacks sufficient scientific basis.[58] [59] [60] This inadequate approach has significant implications for the Conservation Framework. Should overall entanglement risk be significantly more sensitive to the gear type and/or how it is fished than gear density,[61] then the Framework has overemphasized the importance of reducing vertical lines when, instead, it should be focused on reducing the impact of specific gear types and how those gear types are fished.[62] As discussed in other sections of

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[53] J. How. Center for Independent Expert Independent Peer Review of the North Atlantic Right Whale Decision Support Tool. Dec. 2019, at 18.

[54] As discussed below, we believe the DST may actually underweight gear type and configuration as a contributing factor to entanglement.

[55] W.D. Bowen. December 2019. Independent Peer Review of the North Atlantic Right Whale Decision Support Tool, at 9.

[56] J. How. December 2019. Center for Independent Expert Independent Peer Review of the North Atlantic Right Whale Decision Support Tool, at 11.

[57] During its April 2019 meeting, the TRT acknowledged the importance of identifying the threat of various gear types and configurations but rejected NMFS's approach of relying on the mean of seven expert groups. Further, from the Associations' perspective, certain groups that do not work in commercial fisheries would have little insight on the threat of any fishing gear. Others, such as those involved with disentanglement, would have little expertise with gear that is not typically found on NARW. Yet, these groups ranked nearly all gear types, however unlikely they were to entangle whales, as at least a "9."

[58] J. Van der Hoop. (2019) Review of the North Atlantic Right Whale Decision Support Tool.at 13. "The challenge is that we know little about how a co-occurrence becomes an entanglement."

[59]W.D. Bowen. (2019) Independent Peer Review of the North Atlantic Right Whale Decision Support Tool**.** At 9. "Little is known about the circumstances that lead right whales to become entangled or those that result in the whale becoming disentangled."

[60] J. How. (2019) Center for Independent Experts Independent Review of the North Atlantic Right Whale Decision Support Tool. At 2. "Currently there is too much uncertainty regarding the mechanisms surrounding an entanglement and how these are likely to be impacted by changes to gear configuration and whale size etc".

[61] Knowlton *et al*. 2016, at 325.

[62] For example, nowhere in the scientific record cited in the Draft BiOp is there an explanation why the DST uses (gear density) x (whale abundance) x (gear severity) = risk instead of (0.5)(gear density) x (whale abundance) x (gear severity) = risk. As the three DST reviewers noted, there is ample uncertainty about the circumstances of entanglement. NMFS's initial assumption of the importance of gear density to

these comments, factors such as rope strength, gear configuration, weakened points in line, and, ultimately, presence of large aggregations of whales and whale behavior, drive risk.

In sum, the Draft BiOp arbitrarily assigns a 50-50 split rather than using a probabilistic approach informed by observed entanglements from 2010-2019. This inflates the effects of the actions and presents a scenario that is not "reasonably certain to occur." For the foregoing reasons, the Final BiOp should be revised to reflect an allocation of risk between Canada and the United States that is supported by the best scientific and commercial data available regarding relative risk, and the underlying DST definition of risk should be adjusted accordingly to meet that standard.

4. The best available science does not support assigning *all* entangled whales with unknown gear to the commercial trap/pot fisheries.

The Draft BiOp makes a significant assumption by allocating *all* M/SI entanglements of unknown gear type to U.S. commercial trap/pot fisheries, making these fisheries responsible for an additional 38%[63] of entanglements with no evidence of the fisheries' involvement. NMFS justifies this allocation as follows:

> Additionally, 99.7% of vertical lines in the action area are from trap/pot lines (2016 IEC, unpublished data). Given this information and for the purposes of this Opinion, we are assuming that all of the presumed U.S. entanglements in unknown gear were from trap/pot gear (2016 IEC, unpublished data).[64]

Allocating all of the entanglements involving unknown gear to the trap/pot fishery is arbitrary when observed entanglements suggest that NARWs are more often entangled in gear types other than lobster gear. Where the type of gear involved in an entanglement event is *known*, and Canadian trap/pot incidents are excluded, the ratio between non-trap/pot gear and trap/pot gear is 1.75 : 1.[65] In other words, observations involving confirmed gear type suggest that NARW are *nearly twice as likely* to be entangled in gear other than commercial trap/pot fisheries. We understand that gear is recovered in a relatively small proportion of entanglement incidents, and that the gear type is identified in even fewer incidents. However, to completely discount the distinction in observed data and assign *all* entanglements of unknown gear type to trap/pot fisheries is without scientific support and arbitrary.

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risk assessment, therefore, can by no means be treated as a "reasonably certain" effect of the proposed action. A more rigorous analysis of the DST's risk calculation is required.

[63] 78% of M/SI are unknown; the BiOp allocates half of this to the U.S.

[64] Draft BiOp at 224.

[65] Updated NARW incident data provided to P. McCarron via email by C. Coogan (GARFO) on 12/24/2020 per 10/06/2020 request for data to A. Henry (NEFSC). File "2000-2019_right_whale_incident_data_12_23_20v.xls." (Addendum E)

Table 3 Summary of Entanglement Incidents – By Gear Type -- 2000-2019		
	Entanglement	MSI
All events	114	52
Gear known	25	12
Trap/pot	18	10
trap/pot – CN crab	14	8
trap/pot – US	2	1
trap/pot – US lobster	1	0
trap/pot – Unknown	1	1
Non-trap	7	2
Non-trap – US	1	0
Non-trap – country unknown	6	2
Gear unknown	89	40
No gear present	52	18
Gear not recovered	33	19
Gear undetermined	4	3
Source: NMFS NARW Entanglement Data 2000-2019		

Although the number of lines in U.S. waters is overwhelmingly from trap/pot fisheries, NMFS has recognized that not all lines pose the same risk to right whales. NMFS developed the DST to assess the variable threat from different gear types and configurations in its risk assessment. A methodology is under development to assess risk of lobster lines based on the type of rope fished (*i.e*. diameter) and the configuration of the gear (*i.e*. length of line, length of trawl).[66] Even with an incomplete understanding of the threat of various gear types, early results of the DST show that line density as a singular factor is not a good indicator of risk to whales. For example, the state of Maine, using the DST, determined that 70% of risk to NARW in Maine waters gear occurs in an area where only 10% of lines are fished.[67] This information should be more fully considered in the Final BiOp and should be applied, as appropriate, to the definition of risk in the DST as indicated in Section III.B.3 and n. 62.[68]

Additionally, the best available data show that both the entanglement risk and potential of a severe entanglement differ between trap/pot and non-trap gear. Just as encounters with strong, large diameter line fished in Canadian trap/pot fisheries have been responsible for the majority of NARW M/SI in recent years, it is likely that a NARW encountering gear spread across the water column would have a high likelihood of entanglement. It is important to recognize that a vertical

[66] See Presentation on Decision Support Tool at April 2019 TRT meeting at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/02_presentation_on_risk_reduction_tool.html.

[67] Erin Summers, Maine DMR personal communication on 2/12/2021. Similar presentation in DEIS, Appendix Volume 2, page 3-105 with preliminary risk analysis "Maine federal waters from the 3- mile line out to 12 miles constitutes 11% of Maine's annual NARW occurrence and 88% of Maine's NARW presence is contained beyond 12 miles."

[68] We also urge NMFS to seek expert judgment from those with a deep understanding of the dynamics of fishing gear – fishermen – to develop this portion of the DST, and to also expand this tool to assess the risk of non-trap gear.

line occupies less than an inch across the water column while non-trap gear is fished in wide strings that could pose greater risk if deployed where they coincide with whales engaged in higher risk behaviors.[69] A methodology has been developed by Woods Hole Oceanographic Institute in collaboration with the fishing industry to attribute risk to gear based on proportion of water column occupied.[70] This information should also be considered in the Final BiOp.

Finally, the Draft BiOp does not address the potential for a whale to shed trap versus non-trap gear, which is highly relevant considering that fishing gear is shed in the majority of incidents. Two-thirds of all entanglement events are minor,[71] meaning that whales frequently shed fishing gear without serious injury to the individual. It is reasonable to assume that the entanglement profile of fishing gear influences the likelihood of its being shed and therefore constituting a "minor" entanglement. The Draft BiOp does not analyze differences between trap and non-trap fisheries with respect to the potential to cause M/SI. Instead, it arbitrarily assigns all M/SI resulting from unknown gear type to trap/pot fisheries rather than using a probabilistic approach informed by observed entanglements.

We urge NMFS to take a consistent probabilistic approach for all apportionments in the BiOp. This would first consider apportionment based on observed data. It should also consider additional data, information, and expert judgment, as appropriate, and apply them in a manner that refines the allocations based on observed data. As currently written, the Draft BiOp arbitrarily assigns all M/SI from unknown gear to trap/pot fisheries despite undisputed evidence to the contrary. Again, this inflates the effects of the trap/pot fisheries and presents a scenario that is not reasonably certain to occur.

5. The BiOp does not account for the full benefits of using weak links.

Certain mitigation measures implemented through Phase 1 of the Conservation Framework can be expected to reduce minor, moderate, and severe (*i.e.*, those resulting in M/SI) entanglements by equal amounts. For example, mitigation measures that reduce the number of lines in the water (*e.g.*, trawling up or a closure) would reduce the risk of entanglements of all severities. Weak points inserted in rope, however, may significantly reduce the *severity* of entanglements because weak points in the line allow the whale to break free of the gear as the individual whale applies force to swim free. There is a rational basis to assume that weak points inserted into vertical lines more effectively reduce the likelihood of M/SI relative to other mitigation measures. However, the Draft BiOp does not consider the benefits of insertion of weak points. Were the requirements for weakened vertical lines to reduce risk of severe entanglements by more than 60 percent, thereby significantly reducing M/SI, then the need for further mitigation requirements under Phase 3 and 4 may be reduced or eliminated entirely.

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[69] NOAA List of Fisheries at https://www.fisheries.noaa.gov/national/marine-mammal-protection/northeast-sink-gillnet-fishery-mmpa-list-fisheries.

[70] See Kite-Powell, H.L., C. Brehme, S. Kraus, P. McCarron, H. Tetreault, and B. Wikgren. In preparation. The spatial and temporal distribution of risk to Right Whales from lobster fishing gear off the coast of Maine.

[71] Maintenance of the North Atlantic Right Whale Catalog, Whale Scarring and Visual Health Databases, Anthropogenic Injury Case Studies, and Near Real-Time Matching for Biopsy Efforts, Entangled, Injured, Sick, or Dead Right Whales October 1, 2020 at 50.

Further, the Draft BiOp appears to discount scientific literature that suggest actions that reduce only the severity of entanglement (and not the likelihood) may be sufficient to recover the NARW. Knowlton *et al*. (2015)[72] found that, "broad adoption of ropes with breaking strengths of ≤7.56 kN (≤1700 lbsf) could reduce the number of life-threatening entanglements for large whales by at least 72%, and yet could provide sufficient strength to withstand the routine forces involved in many fishing operations. A reduction of this magnitude would *achieve nearly all the mitigation legally required for U.S. stocks of North Atlantic right and humpback whales*" (emphasis added).

In the Lobster Fishery, vertical lines do not maintain their manufactured breaking strength over time. Vertical lines consist of at least two pieces of rope, and often more if fished in deeper waters. The majority of vertical lines are fished for five or more years and become significantly weaker than the manufactured strength, degrading within the first few months in the water, and further over time, due to wear from the hauler, contact with the traps and bottom substrate, and exposure to sun.[73] The majority of these ropes are joined together with a knot, and less commonly with a splice. A knot will weaken the line by up to 50% because it creates a curve in the rope in which the outer circumference is greater than the inner part. The difference in length creates stress across the width of the rope when put under tension, which undermines its strength. Splices are stronger than knots but will typically reduce rope strength, though this result varies widely depending on the type of splice and the number of tucks into the line. A typical inshore vertical line consists of a 5/16" sink rope at the surface (the U.S. does not allow floating line on the surface), knotted or spliced into a 3/8" floating line, which runs to the trap.[74] Single or multiple pre-cut lengtheners are added to the line as gear is shifted into deeper waters.

Although lobster gear is already fished with rope that is below manufacturers' rated strength specification and in a manner that incorporates weak points throughout the vertical line, Maine DMR has been conducting research, with funding from NMFS and in collaboration with the Associations, to develop and test manufactured weak points, specific knots and splicing techniques that break at 1700 pounds pressure or less and leave a bitter end that will not get caught in baleen. This research has demonstrated that rope always breaks at its weakest point. When lines made up of more than one rope type were broken, the rope always broke on the weaker (smaller diameter) side of the knot or splice. DMR is preparing a list of knots and splices and exploring manufactured devices that can be inserted into the line to ensure it will break when it experiences 1700 pounds of force or less. These approaches have buy-in from lobstermen and could be quickly adopted and provide immediate benefit to NARW.

Maine DMR, in collaboration with the Associations, is also field-testing time tension line cutters ("TTLC") as an option to allow rope encountered by a whale to break while maintaining enough strength to be safely fished in areas where 1700-pound weak points are too weak to allow for safe retrieval of gear. A TTLC is rigged into the vertical line and will cut the rope after it

[72] Knowlton, A.R., Robbins, J., Landry, S., McKenna, H.A., Kraus, S.D., and T.B. Werner (2015), Effects of fishing rope strength on the severity of large whale entanglements. Conservation Biology 30: 318-328.

[73] Maine DMR tested the breaking strength of vertical lines used by lobstermen; ropes consistently broke well below manufactured rope specifications. Draft Environmental Impact Statement; ALWTRT Risk Reduction Rule, Appendix I.

[74] P. McCarron and H. Tetreault, Lobster Pot Gear Configurations in the Gulf of Maine, 2012. https://www.bycatch.org/sites/default/files/Lobster_Gear_Report_0.pdf.

senses a certain tension on the line that occurs for a set period of time (as programmed in the device). If a whale encountered the line thereby applying tension, the device would cut the rope as prescribed by the TTLC. NMFS should consider this to reduce the frequency and severity of entanglement in heavier lines, as an alternative solution to weak points, that would allow strong line to break free if encountered by NARW. This device has already been through significant engineering, testing and field research and provides another option to reduce the severity of entanglement in heavier lines that could be implemented in the near-term.

There is evidence in the literature that NARW are capable of applying enough force to break ropes weakened with insertions of 1700-pounds or less[75], and that those encounters rarely result in a severe entanglement. Lobster gear already incorporates many weak points in vertical lines through the routine rigging of multiple ropes into a single line. The addition of 1700-pound weak points in line will further reduce NARW M/SI. The Final BiOp must account for the full conservation benefit of incorporating 1700-pound weak links in vertical lines to accurately characterize the effects of the action.

6. NMFS overestimates the contribution of cryptic mortality to annual M/SI.

Without explanation, the Draft BiOp fails to attribute any NARW mortality to natural causes.[76] This omission ignores published scientific literature that documents two natural sources of mortality: (1) predation by white sharks and (2) recent, unfavorable oceanographic conditions resulting from climate change.

Taylor *et al*. (2013)[77] document predation events by white sharks on NARW calves in southeast U.S. waters. In addition, Curtis *et al*. (2014) report that juvenile and adult white sharks have been observed scavenging on NARW carcasses on several occasions.[78] The authors point to evidence the sharks may be drawn to NARW calving grounds during the calving season.[79] Curtis *et al*. also present relative abundance analyses for these NARW predators that "offer a more optimistic outlook for NWA [Northwest Atlantic] white sharks than previous reports."[80] The Draft BiOp should, at a minimum, consider this qualitative evidence that NARW calves are known to be subject to predation by a shark population that appears to be growing and, therefore, presents the risk of increased predation for juvenile NARW. These reports of risk from natural predators are consistent with the draft 2020 NARW Stock Assessment Report that also discusses

[75] Arthur, L. H., W. A. Mclellan, M. A. Piscitelli, S. A. Rommel, B. L. Woodward, J. P. Winn, C. W. Potter, and D. Ann Pabst. 2015. Estimating maximal force output of cetaceans using axial locomotor muscle morphology. Marine Mammal Science 31(4): 1401-1426.

[76] Draft BiOp at 225.

[77] Taylor, J.K.D., Mandelman, J.W., McLellan, W.A., Moore, M.J., Skomal, G.B., Rotstein, D.S., Kraus, S.D., Shark predation on North Atlantic right whales (*Eubalaena glacialis*) in the southeastern United States calving ground. Marine Mammal Science, 29: 204-212.

[78] Curtis, T.H., McCandless, C.T., Carlson, J.K., Skomal, G.B., Kohler, N.E., Natanson, L.J., Burgess, G.H., Hoey, J.J., and H.L. Pratt. (2014). Seasonal Distribution and Historic Trends in Abundance of White Sharks, *Carcharodon carcharias*, in the Western North Atlantic Ocean. PLOS ONE 9(6): e99240 at n.75.

[79] *Id*., at n.76.

[80] *Id*., at n. 21, 27, 77.

natural mortality, noting that 14.5 percent of the 124 recorded NARW mortalities between years 1970–2018 were "believed to have died from perinatal complications or other natural causes."[81]

As discussed elsewhere in these comments, climate change is another natural threat to the NARW population that is not appropriately examined and considered in the Draft BiOp. The Draft BiOp states that climate change may "have several indirect effects on marine mammals, which may include changes in distribution; displacement from ideal habitats; decline in individual and population fitness; increased susceptibility to disease and contaminants; and changes in abundance, migration patterns, community structure, and reproductive success (Jenssen 2006, MacLeod 2009, Simmonds and Eliott 2009)." However, the Draft BiOp makes no credible effort to evaluate the probable impact of climate change on the population over time even though there is ample evidence of indirect effects on marine mammals like NARW in the form of "changes to the range and abundance of competitors and predators (Learmonth *et al*. 2006)"[82] Notably, Gutbrod-Meyer (2018)[83] found that a regime shift attributed to climate-forcing in the 1990s produced "[l]ow prey abundances [that] reduced calving rates, demonstrating the significant impact prey availability can have on NARW demography." Given the undisputed changes to migratory patterns driven by changes in prey availability and associated non-trivial impacts on the fitness of marine mammals such as neonates, the Final BiOp would be arbitrarily deficient if it were to assume no impact of climate change on NARW M/SI.

In sum, it would be arbitrary for the Final BiOp to assume that there is no natural mortality in the population despite published literature to the contrary. Ignoring natural sources of mortality has the effect of underestimating the reproductive capacity of the species and ability of the population to rebound in response to a reduction in anthropogenic mortality and more favorable oceanographic conditions. Further, based on this assumption, the Draft BiOp attributes all cryptic mortality to anthropogenic sources, thereby unjustifiably overestimating the impact of the Lobster Fishery. This again contributes to an effects scenario that is "not reasonably certain to occur."

7. Linden (2021) is an unreliable study and an inappropriate basis for making 50-year projections.

a. The Linden (2021) model is overly sensitive to new data.

Linden (2021) is based on observed calving and modeled mortality rates derived from 2010-2018, a period characterized as a "regime shift" due to warmer temperatures and changes in NARW prey distribution. The BiOp scenarios are parameterized on a different time period than reported in Linden (2021), 2010-2019, but documentation of these model runs is not included. This is significant because the Linden model relies on output from the Pace *et al.* (2017) model which has demonstrated the sensitivity of estimated demographic rates to incremental additions of additional years of data. Therefore, the addition of another year of data (*i.e*., 2020 data) is likely to produce a markedly different projection because the resultant life

[81] Draft 2020 Right Whale Stock Assessment Report at 55.

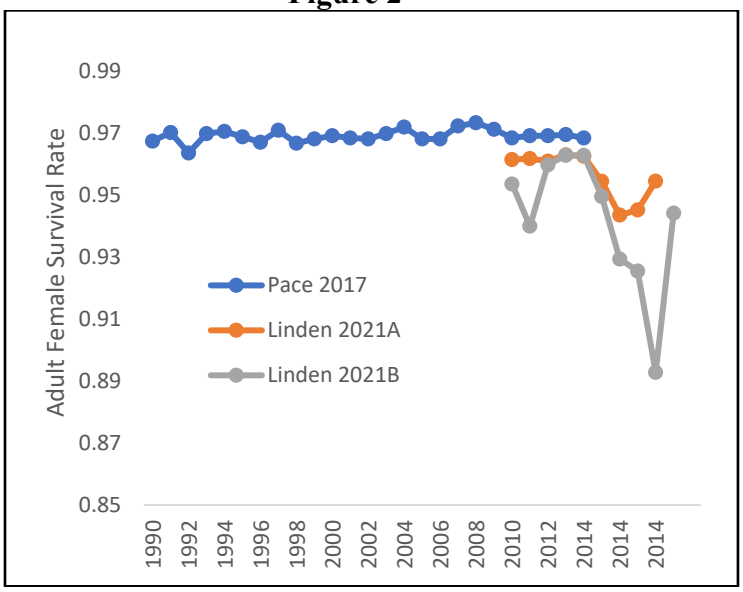
[82] *Id.,* at 207.

[83] Gutbrod-Meyer, E.L., Greene, C.H., and K.T.A. Davies. (2018) Marine species range shifts necessitate advanced policy planning: The case of the North Atlantic right whale. Oceanography. 31: 19-23.

history parameter estimates may be dramatically different, just as they differed from the 2010-2018 estimates after adding 2019 data. We acknowledge that independent reviewers supported the time period to begin in 2010; however, these favorable reviews do not negate the fact that the Linden model is very sensitive to new data. The addition of one year of data will provide a different NARW population projection over the next 50 years.

Three versions of the Pace *et al.* (2017) state-space mark-recapture population model ("SSMR") demonstrate changing demographic parameter values each time new data are added to the model. The Pace model estimated the survival probabilities of NARW females from 1990 to 2014. Linden (2021), as documented in the Draft BiOp Appendix 3, updated the model to include data through 2018, and Linden (2021B) included data through 2019 as the basis for the Draft BiOp scenarios. Figure 2 below demonstrates how with each addition of new data, the estimated adult survival rates change, sometimes dramatically. The addition of 2019 data (Linden 2021B) in particular, alters the survival estimate for other years in the time series, affecting at least eight years prior to the added year (2010).

Figure 2



The assumed demographic rates on which Linden (2021) relies are not the demographic rates used in Linden's model version as the basis of analysis in the Draft BiOp. The addition of the 2019 data produced new survival (and other vital) rates that imply a substantial change in the demographic parameters used in the matrix population model, which is particularly problematic because the elasticity (Table 2 in Draft BiOp Appendix 3) of the Linden model demonstrates that adult survival "had the greatest potential to affect growth rate." The addition of 2019 data dramatically changes the estimates of demographic parameters on which population projections are based. Note also that 2019 data are the most recent available. The extent to which 2020 data, which have already been collected, will again change estimates is unknown.

Both the Pace and Linden models are relatively new and highly sensitive to additional years of data. For example, including data from 2009, the highest year on record for new NARW calves, could fundamentally change the projections of the Linden model. By selecting 2010 as a precise demarcation of regime change effects, the analysis no longer reflects the variability

evident within longer time frames and only narrowly excludes the highest value in observed number of calves. The Associations recommend conducting a sensitivity analysis on the demarcation of the "regime shift" period, for both beginning and end data years, to inform how reliant the model projections are on a precise definition of an inherently imprecise environmental process.

In addition, four of the nine years upon which the Linden model is based were associated with a significantly lower probability of re-sighting individual NARW. The probability of re-sighting an individual subsequently increased to historic levels in years 2017-2019.[84] The driver for this decline in re-sighting is not explained. The Pace model treats it as an indicator of the probability of detection. However, it is likely a result of the documented shift in NARW geographic distribution. Once NMFS completely redesigned its NARW survey,[85] individuals were re-sighted in subsequent years, and the mortality estimates from these prior years would have been upwardly revised.

Because both the Pace and Linden models are relatively new and highly sensitive to new data inputs, the addition of one year of data will likely provide very different NARW population projections over the next 50 years. These models are not sufficient to fully inform the long-term actions required under the Conservation Framework and result in an overestimate of the risk reduction that NMFS believes is needed.

b. The Linden (2021) model improperly parameterizes calving rate.

Linden (2021) is also flawed because it arbitrarily treats NARW calving rate differently than survival. The Linden model erroneously treats the calving rate with more certainty in its matrix model simulations than the survival parameters, preventing the full distribution of credible calving rates to be considered. This locks model outcomes to a relatively small number of specific observed low calving rates even though there is extensive variability and uncertainty in calving rates over time.[86] Specifically, in each year of each model simulation run used in the BiOp, the survival parameters are derived from the full posterior distributions of adult female survivorship supplied from Pace's SSMR model for 2010-2019.[87] For the calving rate, however, the value for each year was not drawn from the full posterior distributions estimated by the SSMR model. Instead, the calving rate is drawn as only one of the ten annual means of calving rates from 2010-2019, even though the full posteriors would have been available for these derived values during 2010-2019. This method severely limits the potential range of calving values represented in the model. Importantly, calving rates were reported without 95% credible

[84] Pettis, H.M., Pace, R.M. III, Hamilton, P.K. 2021. North Atlantic Right Whale Consortium 2020 Annual Report Card. Report to the North Atlantic Right Whale Consortium.

[85] T. Cole presentation Oct 2018 TRT meeting at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/October%202018/2018_nefsc_aerial_surveys.pdf.

[86] Draft 2020 NARW stock assessment, at 48, "During 1990–2017, at least 447 calves were born into the population. The number of calves born annually ranged from 1 to 39, and averaged 16 but was highly variable."

[87] Pace *et al.* (2021) clarifies that derived values may be treated as a posterior because it is derived from posteriors.

intervals, making it additionally difficult[88] to assess how the disparity in life history parameters from the SSMR model inputted into the matrix model affect the population projections. The Associations therefore recommend that NMFS re-run the model simulation scenarios using the full derived posterior distributions of calving rates from 2010-2019.

c. The Linden (2021) model improperly assumes an equal sex ratio.

An equal sex ratio is not reflective of the current NARW population as determined by Pace *et al*. (2017). The matrix model further assumes all individuals share the same demographic parameters, but for small populations individual variation can be important to modeling survival. To this point, the SSMR model reports that additional stress on females has led to an increasingly male-dominated population. Applying an assumption that 50% of observed deaths are female is, therefore, unreasonable. If males make up a larger portion of the population (Pace *et al*. 2017), males are statistically more likely to encounter and become entangled in fishing gear. Alternatively, females are thought to be at greater risk of death from an entanglement when an incident does occur.

Thus, there are two opposing forces on sex ratio—males are at greater risk of encountering fishing gear, but females are at a greater risk of mortality when entangled—but it cannot be assumed that these forces balance each other out in all cases. Importantly, if entanglement is one of the sources of stress disproportionality causing female mortality, as Pace *et al*. (2017) suggest, then we could expect the male/female ratio to respond differently to alternative mortality reduction scenarios.

The Associations recommend including males in the population model, as done by Fujiwara and Caswell (2001), in what Linden calls, "the motivating example for this modeling framework." Similar concerns about the treatment of the male/female ratio were also raised by Cryer (2020) during model review.[89] An individual-based modeling framework would be more appropriate for incorporating this variation, as well as for incorporating sublethal entanglement effects. Such a model appears to be under development by the Population Evaluation Tool Subgroup of the Northeast Implementation Team. The Associations recommend that this individual-based model should be used in place of the matrix projection model.

d. The Linden (2021) model improperly assumes constant and unfavorable environmental conditions will persist for 50 years.

Additionally, Linden (2021)'s projections of future NARW populations are inappropriately based on the assumption that the environmental conditions of the Gulf of Maine and North Atlantic drive NARW demographic parameters and that these environmental conditions and subsequent demographic parameters will persist for 50 years into the future. Historical trends in environmental conditions for this region indicate regime changes are

[88] The intervals could be recalculated based on Supplement 1.

[89] Cryer (2020) at 5. "Similarly, it is also assumed without much documented support, that males and females are equally vulnerable to entanglement in pot fisheries (and to all anthropogenic mortality in Canada). Is the evidence for this assumption strong, or is it plausible that the lower survival rate of females is partly due to higher fishing-related or ship-strike mortality than males?"

common (Morse *et al.* 2017), and no evidence is provided in the draft BiOp to suggest that fluctuating oceanographic conditions will cease.

Furthermore, Linden's analysis of model projections using the full time period (1990-2018) to parameterize the model (Supplement 4) demonstrate that the model outcome is very sensitive to the assumptions regarding what historical period will be representative of future conditions. Similar concerns were raised by New (2020) during the CIE review, noting that the assumption that 2010-2018 conditions will continue for 50 years is "a strong one, especially given the observed variability in calving from 1990-2018."

e. The model improperly finds that adult survival has the greatest potential to affect growth rate.

Model elasticity is reported in Table 2 (Draft BiOp, Appendix 3), which Linden interprets to indicate that adult survival "had the greatest potential to affect growth rate" and as justification to focus the model on adult survival (to the exclusion of calving rate, as discussed above). In contrast to all other evaluations of the model (except for Supplement 4), these elasticities were based on the average demographic parameters from the full time series, 1990-2018, and not on the 2010-2018 time series, from which model projections were derived, nor the 2010-2019 time series on which the Draft BiOp is based. New (2020) also noted in her model review the need to perform perturbation analyses (of which elasticity is one type). The Associations recommend recalculating the elasticity using the 2010-2019 demographic data to better understand the relative effects of different parameters on model outcomes.

f. The retrospective validation for the Linden model (2021) is not reliable.

The "retrospective validation" (Figure 7) performed on Linden (2021) is not reliable. It was performed using the same data that provided the model parameters. That is, the Pace *et al*. (2017) SSRM model was fit using data from 1990-2018, and the estimated parameters were input into the matrix model and then used to retrospectively predict 1990-2009. It should be expected that the model would perform well on the same data used to build the model. Importantly, however, the retrospective analysis significantly underestimates the population size in the later years of the retrospective analysis. The end of the prediction series is where the "process" error in the projection would accumulate most dramatically, as systematic errors (*e.g*., chronic under or over estimation) multiply in each year. Figure 7 suggests incipient *systematic underestimation of the number of females after 20 years*.

This same underestimation could be expected to be further compounded in the 50-year projections. No quantitative assessment of model performance is provided, only a visual interpretation of the model fit. The Associations *recommend* that a quantitative measurement of model fit (*e.g*. root mean squared error) and potential for bias should be provided. Additional validation should be performed *in silico* using the simulated populations described and fit by Pace *et al*. (2017) to test the SSMR model, and New (2020) and Getx (2020) suggestions of the addition of a validation check in their reviews of Linden (2021) should be incorporated.

8. In sum, the Draft BiOp presents an effects scenario that inflates the assumed risk from the lobster fishery and is not "reasonably certain to occur."

As explained in Section III.B.1 *supra*, NMFS must objectively evaluate the effects of the action that are "reasonably certain to occur" based upon the "best available scientific and commercial information." The effects analysis fails to meet this standard because, as set forth in the sections above, it presumes effects that do not occur and overestimates the impact of other assumed effects. We urge NMFS to make the corrections recommended above. Without those corrections, the BiOp arbitrarily presents an effects scenario that is not based upon the best available scientific commercial information and is not reasonably certain to occur, as required by law.

C. The Conservation Framework Must be Improved.

1. Certain proposed TRP measures will further reduce impacts and certain measures are arbitrary or unnecessary.

The Associations support risk reduction measures that are based on the best available science and appropriately designed to achieve applicable legal standards. To do so, the scope of management alternatives must accurately reflect the risk posed by each commercial fishery contributing to M/SI from entanglement. NMFS's management scope has been, and currently is (as evidenced by Phase 1), disproportionately and unjustifiably focused on the Lobster Fishery. As described in the comments above, NMFS is not sufficiently addressing other, more substantial sources of NARW M/SI. NMFS must address the entanglement risk posed by all commercial fisheries in order to fulfill its legal obligations.

Additionally, NMFS has not acknowledged data showing that the Lobster Fishery has substantially reduced the risk it presents to NARW over the past decade through implementation of risk reduction measures. Instead, as explained in the comments above, NMFS relies on assumptions that artificially inflate the risk of the Lobster Fishery based solely on number of lines fished—an assumption it rejects in its DST, which calculates risk based on whale density, gear density, and risk of gear fished. [90]

For all of the reasons stated above, the Associations object to the risk reduction goal set by NMFS for the Proposed Rule. The Associations urge NMFS to adopt a uniform probabilistic approach, relying on observed data to apportion all unknown human causes. When available, additional data, information and expert judgment should be used to refine proportions. This methodology should apply to apportionment of (1) unknown human causes to vessel strikes versus entanglements, (2) unknown entanglements between U.S. and Canada, and (3) unknown U.S. entanglements among U.S. fisheries.

The Associations are concerned with several elements contained in the Proposed Rule for which we will provide more detail in our comments on that proposed action by March 1. These concerns are summarized as follows:

[90] As indicated at n. 62, the Associations believe the DST calculation of risk nevertheless gives undue weight to gear density to the detriment of whale behavior and other factors.

- The Proposed Rule does not include a provision for conservation equivalencies. This is necessary to allow fishing areas to adapt proposed management measures based on local fishing conditions.

- The Proposed Rule does not allow lobstermen to split trawls in half and fish with one endline. This would have equivalent conservation benefit to NARW while allowing smaller vessels within the fleet to more safely manage gear.

- The Proposed Rule, and the supporting DEIS, include additional measures that were not proposed or vetted by the TRT or by the jurisdictions that submitted draft plans for fisheries in their respective areas. The Preferred Alternative includes restricted areas which effectively create ropeless fishing areas. The LMA1 restricted area, for example, has not been previously identified for more aggressive management by the TRT or any of the jurisdictions. The basis for these closures lacks support or analysis on the record. The Associations recommend that NMFS explore development of minimum criteria that must be met to consider triggering a buoy line closure, such as minimum NARW aggregation size, presence of NARW aggregation for a minimum time period, and recurrence of NARW aggregations over a minimum number of years. This is reflective of the rationale used for the Massachusetts Bay Restricted Area.

- The Proposed Rule's Preferred Alternative to establish areas for buoy line closures does not address the inability of the lobstermen to fish buoy-less gear based on significant unanswered concerns regarding the availability, reliability, safety and cost of buoy-less gear systems, and additional challenges with gear conflict and enforcement. These concerns are outlined in more detail below.

- The Proposed Rule does not specify how lobstermen can meet the weak point requirements. Maine DMR has been working closely with the Associations to develop a list of methods that would meet this requirement. The Associations recommend that NMFS ensure a robust and flexible list of options be made available to lobstermen, and refinements to this list can be made over time as new data become available. This should include weak point equivalents such as time tension line cutters.

- The Proposed Rule grossly underestimates the economic impact of the measures in the Preferred Alternative on the fishing industry. The Associations will provide more detail about those impacts in our comments on the Proposed Rule.

2. The benchmarks proposed in Phases 3 and 4 of the Conservation Framework are arbitrary, unsupported, and very likely unnecessary.

We strongly believe that Phases 3 and 4 will not be necessary once NMFS reevaluates the trap/pot fisheries after correcting the errors outlined above. At a minimum, the revised evaluation should allocate M/SI using a probabilistic approach based on observed data and consider natural mortality. NMFS should re-run the Linden (2021) model using a calving rate that is both responsive to improvements resulting from risk reduction measures pursuant to Phases 1 and 2 (such as by evaluating the sensitivity of the projections to a calving rate that increases over time) and uses the full derived posterior distributions of calving rates from 2010-2019. Given the

sensitivity of the Pace and Linden models to new data, all models should be updated at the end of Phases 1 and 2 before NMFS requires subsequent mitigation measures.

The worst-case scenario constructed by the Draft BiOp also assumes that Canada does not reduce the number of M/SI incidents occurring from its own activities, despite the fact that it implemented numerous actions since 2017. Although we believe Canada must go much further to reduce its impacts on NARW, it is likely that the risk to the NARW population from Canadian fisheries will measurably improve as a result of Canada's actions. And we implore NMFS to engage more directly and aggressively with Canada to ensure that equivalent risk reductions are implemented bilaterally. Before proceeding with Phases 3 and 4, NMFS should review its allocation of M/SI between the two countries and update its models to reflect the performance of Canada's mitigation programs.

3. The Phase 4 Benchmark of 0.11 M/SI in the Conservation Framework is arbitrary and inconsistent with law.

NMFS states that it "determined that M/SI in the federal fisheries needs to be reduced to 0.11 on average annually, within 10 years under a phased implementation (see below), to ensure that the fisheries will not appreciably reduce the likelihood of survival and recovery of the species." Conservation Framework at 4. However, although NMFS analyzes a scenario in which 0.11 M/SI is reached in 10 years, NMFS *provides no legal or scientific support* for its determination that M/SI "needs to be reduced to 0.11." NMFS could almost certainly determine that an action causing only 0.11 M/SI annually is not likely to jeopardize the NARW. But that does not mean that a 0.11 MS/I rate is *necessary* to achieve no-jeopardy. Nor is it necessary or proper for NMFS to affirmatively make that determination.

The ESA requires NMFS to evaluate an action as proposed and to determine whether, under Section 7(a)(2), the action is "likely to jeopardize the continued existence of any endangered species or threatened species." 16 U.S.C. § 1536(a)(2). In so doing, NMFS must examine whether the proposed action "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." 50 C.F.R. § 402.02 (emphases added). This question—framed in qualitative terms—is not capable of being reduced to a single metric. Indeed, we are aware of no biological opinions issued by NMFS or its sister agency, the U.S. Fish and Wildlife Service, in which the agency reduced the jeopardy inquiry to a single metric that "needs to be" met (much less a metric measured to the hundredth of a decimal point).

To the extent that the quantitative metrics used for MMPA purposes—such as M/SI, as referenced in the Conservation Framework—are relevant to the "jeopardy" standard, they do not provide any hard and fast answers to the nuanced question presented by ESA Section 7. To be sure, at least two courts have determined that MMPA standards are qualitatively *more* stringent—*i.e.*, more *protective* of marine mammals—than analogous ESA standards. *See Ctr. for Biological Diversity v. Salazar*, 695 F.3d 893, 913 (9th Cir. 2012) (MMPA "negligible impact" more protective than ESA "jeopardy" standard); *In re Polar Bear Endangered Species Act Listing & 4(d) Rule Litigation*, 818 F. Supp. 2d 214, 233 (D.D.C. 2011) (approving Service's "exhaustive analysis in which it determined that the MMPA is comparable to, or even stricter than, the take provisions of the ESA in most respects"). But no court has held that achievement

of an MMPA metric (such as a particular M/SI rate) is *necessary* for a no-jeopardy determination. And even if it were possible to reduce the jeopardy inquiry to a single metric, there is no rational basis for NMFS to conclude that an M/SI rate of approximately *one-eighth* of the established "potential biological removal" rate ("PBR") is *necessary* for a no-jeopardy finding.

Indeed, PBR is one of the MMPA's most precautionary (*i.e.*, protective) metrics which, by statute, represents 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 population*." 16 U.S.C. § 1362(20) (emphasis added). "Optimum sustainable population," in turn, means "with respect to any population stock, the number of animals which *will result in the maximum productivity* of the population or the species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element." *Id*. § 1362(9) (emphasis added). We are aware of no case law or other authorities that compare the MMPA's PBR standard with the ESA's jeopardy standard. However, at the very minimum, it is an open question whether an action causing some level of M/SI at a rate (equal to PBR) that, by the MMPA's definition, allows the species to achieve its *maximum productivity* will nevertheless "appreciably reduce" (*i.e.*, jeopardize) the likelihood of the species' survival or recovery. And it certainly cannot be the case that an M/SI level that is a tiny fraction of the rate (equal to PBR) that allows a species to achieve *maximum productivity* is *necessary* to avoid jeopardy.

Moreover, a collective M/SI rate of 0.11 across all of the ten fisheries would almost certainly *not* be necessary to meet the take reduction goals of MMPA Section 118. Under Section 118, the "immediate goal" of a take reduction plan is to reduce a marine mammal stock's M/SI from commercial fisheries to below PBR. 16 U.S.C. § 1387(f)(2). In addition to that goal, Section 118 establishes a "long-term goal" to reduce the MSI "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*." *Id*. (emphasis added). The 0.11 metric is far below PBR for NARW. Although not stated by NMFS, a 0.11 M/SI rate may be aimed at achievement of the Section 118 long-term goal of levels approaching zero M/SI. But NMFS fails to explain how an M/SI rate of 0.11 across all ten fisheries can be reached taking into account—as NMFS must— "the economics of the fishery, the availability of existing technology, and existing State or regional fishery management plans." *Id*.

Regulating the fisheries down to an M/SI rate of 0.11 would mean the economic decimation, if not elimination, of the U.S. lobster fishery. That means achievement of 0.11 M/SI would be inconsistent with, and indeed would undermine the MMPA's long-term take reduction planning goal, which expressly requires that take reduction plans consider impacts on fishery economics. It should go without saying that an M/SI rate reduction that exceeds requirements to meet MMPA goals and likely renders a fishery economically non-viable far exceeds the agency's obligations under the statute. Given the substantially over-precautionary assumptions built into NMFS's analysis, and the significant uncertainties noted in these comments about the scientific grounding for that analysis, the Associations submit that the Draft BiOp is scientifically and legally unsupportable.

"Jeopardy" for NARW cannot be reduced to a single metric, given the complexity of the factors described above when applied through Section 7(a)(2)'s qualitative framework. Moreover, it is arbitrary and unreasonable to establish a metric that is far below PBR when the basis for that metric is both (1) unexplained and (2) far more stringent than what would be required to achieve the more protective goals of the MMPA, including those stated in Section 118. NMFS's statement that the M/SI rate "needs to be reduced" to 0.11 to achieve a "no jeopardy" finding misconstrues the jeopardy standard and demands a result that is not required by either the ESA or the MMPA.

4. Phases 3 and 4 of the Conservation Framework unreasonably minimize the role of existing statutes and related processes.

Two primary sources of authority govern the ongoing federal regulation of the Lobster Fishery: the ACFCMA and the MMPA. It is unclear how NMFS intends the Conservation Framework to be implemented through, or in conjunction with, these statutes. The Framework states:

> NMFS will *consider* input from the New England and Mid-Atlantic Fishery Management Councils and the Atlantic States Marine Fisheries Commission in developing and implementing mitigation measures under this Conservation Framework. We anticipate that the ALWTRT will be convened at least annually to evaluate incidental entanglement mortality and serious injury, right whale population status, gear monitoring, gear research, and compliance, as required by the MMPA. Any ALWTRT recommendations and associated MMPA rulemaking will be *considered*.

Conservation Framework at 7 (emphases added). The problem is that NMFS does not simply "consider" processes that are mandated by federal law and govern the prosecution of the Lobster Fishery. Those processes will be ongoing (as required by law) over the 10-year period of the Conservation Framework (and beyond), will inevitably result in management changes to the Lobster Fishery and, accordingly, must be taken into account.

The ACFCMA was enacted by Congress to "support and encourage the development, implementation, and enforcement of effective interstate conservation and management of Atlantic coastal fishery resources." 16 U.S.C. § 5101(b). To carry out this purpose, Congress explained:

> The responsibility for managing Atlantic coastal fisheries rests with the States, which carry out a cooperative program of fishery oversight and management through the Atlantic States Marine Fisheries Commission. *It is the responsibility of the Federal Government to support such cooperative interstate management of coastal fishery resources.*

16 U.S.C. § 5101(a)(4) (emphasis added). Under the ACFCMA, the Lobster Fishery is managed by the Atlantic States Marine Fisheries Commission, which updates and implements the

American Lobster Fishery Management Plan ("FMP"). The Fishery will continue to be managed under the FMP for the next 10 years (and beyond). This must be taken into account in the Conservation Framework.

In addition, the Lobster Fishery is subject to management under Section 118 of the MMPA. It is formally included within the scope of the ALWTRT. Under MMPA Section 118, the TRT makes recommendations for accomplishing the short- and long-term goals of Section 118 (described above). NMFS implements those recommendations through promulgation of federal regulations. 16 U.S.C. § 1387(f)(7). MMPA Sections 117 and 118 set forth the standards and processes governing the issuance of take reduction planning regulations, and the Conservation Framework has no legal bearing on that process. For example, NMFS cannot issue regulations under Section 118 that serve to regulate a fishery down to an M/SI rate below PBR that cannot be achieved when "the economics of the fishery, the availability of existing technology, and existing State or regional fishery management plans" are taken into account. *Id.* § 1387(f)(2). Thus, both the MMPA and ACFCMA must be integrated into the Conservation Framework as they will govern the prosecution of the Lobster Fishery for the foreseeable future.

5. The Conservation Framework must build in a more specific adaptive management component.

For the reasons set forth in all of the comments above, Phases 1 and 2 of the Conservation Framework are sufficient to support a no-jeopardy conclusion.[91] The Associations recommend that NMFS perform a comprehensive assessment of the fisheries within some reasonable time after the effectiveness of the implementation of Phases 1 and 2 can be evaluated. In this respect, the Associations support elements of the adaptive management provisions of the Conservation Framework. Specifically, the Associations agree that "[a] primary tenet of adaptive management is to evaluate the efficacy of management actions." Conservation Framework at 5. The Associations also agree that the Conservation Framework must "include[] a comprehensive evaluation mid-way through implementation to determine whether target reductions in M/SI specified for the final five years of the Framework need to be fully implemented" (or implemented at all). *Id*.

Furthermore, the U.S. must engage with Canada in a more direct and transparent manner. To date NMFS has provided only intermittent updates on what is characterizes as "positive" developments with Canada, yet NARW continue to die in large numbers in Canada. There has been no transparency or accountability in this process. If NARW are to recover, the U.S. must ensure that Canada has effective and measurable conservation measures in place.

[91] The Associations maintain that implementation of Phase 1 is sufficient to support a no-jeopardy determination for the Lobster Fishery, which is a separate action evaluated in the BiOp. *See* 50 CFR § 402.14(c)(4) ("Any request for formal consultation may encompass, subject to the approval of the Director, a number of similar individual actions within a given geographical area, a programmatic consultation, or a segment of a comprehensive plan. *The provision in this paragraph (c)(4) does not relieve the Federal agency of the requirements for considering the effects of the action or actions as a whole*." (emphasis added)); *see also* 50 CFR §§ 402.14(g), 402.14(h)(1), 402.14(i) (referring to the Services' obligation to make jeopardy determinations and issue ITSs with respect to an *action*). The Draft BiOp fails to make separate jeopardy determinations, and to issue separate ITSs, for each of the proposed actions. *Id*.

The Associations further agree that all of the factors set forth at the top of page 7 of the Conservation Framework should be considered in a comprehensive assessment of the effectiveness of Phases 1 and 2.[92] In addition to those factors, the comprehensive assessment should consider:

1. A full and accurate evaluation of all of the issues addressed in Sections III.B.2 -.7 above.

2. The likelihood of entanglement of NARWs based on whale abundance, behavior, and gear type. In other contexts, researchers have developed models to predict the abundance and distribution of whales in certain areas based upon oceanographic, ecosystem, and biological variables.[93] The Draft BiOp's assessments of entanglement risk primarily focus on the geographic distribution and *quantity* of fishing gear. Those assessments should be improved by understanding the likelihood of entanglement based on both the occurrence *and behavior* of NARWs and the *severity* of entanglement based on fishing gear type and configuration.

3. The likelihood of entanglement by specific gear types and the likelihood of M/SI by specific gear types, taking into account evidence of the effectiveness of management measures to reduce entanglements or M/SI.

To achieve this, NMFS must expedite and complete development of Population Evaluation Tool ("PET") before the 2023 Evaluation. If this cannot be achieved through the Northeast Implementation Team ("NEIT") model, NMFS must hire an expert to complete this work. NMFS must also update the DST so that it includes (1) the entire U.S. Atlantic coast (and eventually Canada), (2) all federal U.S. fixed gear fisheries, (3) an incorporation of whale behavior into the whale density model, and (4) a gear threat tool to incorporate the risk of all federal fixed gear fisheries. The fishing industry should be consulted to provide expert advice in the development of this model within the DST.

The comprehensive assessment of Phases 1 and 2 should be supported by research and monitoring undertaken during Phases 1 and 2 as necessary to fully evaluate all of the factors set forth above and on page 7 of the Conservation Framework. NMFS should also solicit the participation of the states and the fisheries to ensure that the process is fully informed by the "best scientific *and* commercial data available." 16 U.S.C. § 1536(a)(2) (emphasis added). All of this information should be fully and objectively evaluated by NMFS and documented in a thorough report. That report should then be reviewed by the CIE before it is inputted into updated models. If the evaluation, including the CIE report, indicates that the Lobster Fishery, as managed under Phases 1 and 2, may be likely to jeopardize the existence of the NARW, then

[92] Conservation Framework at 7. "1. Population status. 2. Population distribution and habitat usage. 3. Information on calving and survival rates. 4. Entanglements in U.S. state, U.S. federal, and Canadian commercial fisheries. 5. Changes to the federal fisheries (e.g., changes in co-occurrence due to shifts in where the fishery operates or changes in effort). 6. Vessel strikes in U.S. and Canadian waters. 7. Apportionment of M/SI (including cryptic mortality) to federal fisheries and other sources, including M/SI in Canada, and between vessel strikes and entanglement."

[93] *See, e.g.*, https://mmi.oregonstate.edu/gemm-lab/opal-overlap-predictions-about-large-whales-identifying-co-occurrence-between-whales.

NMFS should reinitiate consultation and assess the status of the proposed actions at that time under ESA Section 7(a)(2). *See* 50 C.F.R. § 402.16(a).

D. Kenney (2018) Is Fundamentally Flawed.

The Draft BiOp cites Kenney (2018) at page 95 in support of the hypothesis that reducing mortality from entanglements would be sufficient to recover the NARW if all known or suspected sources of impacts remained constant. However, this population exercise fails to account for basic biological processes, namely, death. To assess the population size in the absence of mortality from entanglement, dead whales cannot simply be added back into the population. Age is not an independent factor and the distribution of ages in the population in one year affects population size in subsequent years.

In Kenney (2018)'s exercise, adding back a whale in a given year assumes that particular individual goes on and stays in the population forever. In fact, these "zombie" whales, along with living whales in this exercise, would be expected to die at a certain rate in subsequent years from other causes. No other causes of mortality are considered, natural or anthropogenic to act on the zombie whales. Further, calves have natural mortality rates that are ignored during scenarios when they are included in this model. *See* Draft 2020 SAR (14.5 percent of the 124 recorded mortalities between years 1970 – 2018 were "believed to have died from perinatal complications or other natural causes).[94] Kenney assumes a constant calving rate of one calf per 5yr (0.2/yr). This process is a vast oversimplification of the life history process of NARW, and Kenney's value of the calving rate is far higher than the "best" current estimate of 0.04 in the Draft Stock Assessment Report (SAR 2020), and would be 4th highest calving rate observed since 1990 according to Linden (2021, Figure 3).

For these reasons, Kenney (2018) does not reflect the best available information and the BiOp's effects and jeopardy assessments should not rely on or utilize Kenney (2018).

E. The Reasonable and Prudent Measures Should be Further Refined and Improved.

The Associations provide the following comments and recommendations for improvement of the reasonable and prudent measures ("RPM") and associated terms and conditions ("T&C") set forth in the Draft BiOp. We do so mindful of the ESA's limitations on RPMs and T&Cs, namely: "Reasonable and prudent measures, along with the terms and conditions that implement them, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes." 50 C.F.R. § 402.14(i)(2).

NMFS should not be considering any management strategy that holds U.S. fishermen accountable for NARW M/SI in Canada. The U.S. must engage directly with Canada in an open and transparent manner to ensure that Canada implements effective and measurable conservation measures.

[94] Draft 2020 Stock Assessment Report, at 55.

1. RPM 1

a. General comments on RPM 1.

The Associations agree with the core premise of RPM 1—*i.e.*, that "NMFS must continue to work with the fishing industry and partners to promote, fund, conduct, and/or review research on gear modifications to reduce incidental takes, and the severity of interactions that do occur, of ESA-listed species." We present the following modifications and additions to improve the effectiveness of RPM 1:

- This RPM and associated T&Cs should express a clear requirement that NMFS will invest in gear research and evaluation. Such research must focus on: (1) understanding the specific risks from existing gear, by fishery and gear type; and (2) investigation of more immediate and practical gear modifications *other than ropeless fishing* that can be implemented to reduce entanglement risk and severity. Such possible modifications include improved gear marking methods, limits on diameter of ropes fished as vertical lines, weak rope insert options, time tension line cutters, newly engineered ropes, alternative trawling and rigging configurations, trap reductions, and dynamic management if adequate NARW surveillance is possible. The research should be scoped and undertaken based on direct engagement and consultation with fishermen and fishing industry representatives, who are best positioned to identify creative and effective gear modifications.

- The process for developing a "Roadmap to Ropeless Fishing" must expressly state that the process will involve direct engagement and consultation with the Lobster Fishery. As described in detail below, there are numerous economic, safety, operational, and enforcement limitations and questions on appropriate scale of implementation that must be resolved in a "Roadmap to Ropeless Fishing." The T&Cs should specify that a draft Roadmap development will include collaboration and consultation with the fishing industry and provided for review and comment by industry stakeholders, after which a final Roadmap will be produced. It must also consider the results of "The Ropeless Fishing Gear Feasibility Study" underway through the Massachusetts Division of Marine Fisheries (DMF) and other current and future ropeless fishing feasibility studies.[95] It is essential that the Roadmap be developed in this fashion to ensure that it addresses appropriate scale of implementation (restricted areas versus broad-scale adoption) engineering questions related to the function and reliability of the technology as well as the substantial economic, safety, and operational issues posed by a fleet as diverse as the Lobster Fishery. This will help to achieve a level of "buy in" from the fishing industry. Without that "buy in," the Roadmap will be impracticable and unlikely to succeed.

- The T&Cs identify priorities for gear research but specify no timelines. The T&Cs should specify timelines to ensure that these important research tasks are accomplished.

[95] https://www.mass.gov/service-details/ropeless-fishing-gear-feasibility-study.

b. Specific concerns regarding development of ropeless fishing.

The Associations have concerns with regard to the accelerated trajectory for development and implementation of ropeless gear technology. Analysis of this nascent gear technology must address significant concerns with its present state of development, with particular focus on methods to ensure the technology can be deployed on a safe and sound operational basis; that it can address gear conflicts; and that it can offer an efficient, practicable method of harvesting consistent with regulatory and economic conditions in the fishery. Moreover, current research and development programs for ropeless gear have not identified a reasonably viable business model for deployment in the diverse conditions of the Lobster Fishery. In the following sections, we describe these issues in more detail and recommend that NMFS account for these in RPM 1, as recommended above.

(i) Technological limitations, cost, and operational constraints make ropeless gear not presently economically viable.

Numerous technological issues must be resolved before ropeless fishing will be commercially viable. The ropeless system aboard each vessel must function reliably and efficiently. Specifically, the technology must include an acoustic trigger and release system to allow for efficient and reliable deployment and hauling of gear, the communications system from the vessel to satellite system must protect private data and function in real-time, and the communication system which translates data from individual vessels to the fleet and enforcement must be developed. According to Dr. Mark Baumgartner of Woods Hole Oceanographic Institute: "We are in the early stages of development – mostly proof of concept with prototypes that are not yet designed for operational fishing by hundreds to thousands of fishermen…. Every system… will need to go through a redesign process to (a) incorporate an interoperable gear location system, (b) work for fishing at scale (e.g., ruggedized design, long endurance), and (c) enable mass production at low cost."[96]

These technological challenges are compounded by the need to incorporate this technology across a very diverse fleet which ranges from single operators fishing from vessels less than 30 feet in length to medium size boats up to 40 feet with a small crew to larger vessels of 65 feet of more that fish in deep offshore waters with crews of up to five. The smallest vessels have very limited workspace and rarely use sophisticated computer or navigational systems. While medium and larger vessels may have greater potential to incorporate GPS and computer technology into a fishing operation, the deck size also remains very limited.

Additionally, there are operational and economic constraints to widespread use of ropeless gear. The economic model for the New England lobster fishery is predicated upon a high volume of landings caught with a gang of 800 or less (1,945 or fewer in LMA 3) traps, where lobstermen compete for prime bottom. This requires lobstermen to efficiently haul and redeploy gear in a predictable manner. Inshore lobstermen may haul 100 to 200 traps per day, working four days on and one day off on a weekly cycle. These boats often deploy small gangs of gear as singles, pairs or triples, that are strategically set on productive hard bottom to

[96] Slide 12 located at https://ropeless.org/wp-content/uploads/sites/112/2019/11/21.-Baumgartner_nearterm_developments_for_distribution_20191113.pdf.

maximize catch. Area 1 federal waters vessels may haul 300 to 400 traps per day, working through a full gang of traps every two days. This gear is typically deployed as trawls across a variety of hard and gravel bottom. Traps are frequently loaded onboard and moved to other fishing areas depending on catch levels. Any hauling and redeployment system that results in fewer traps hauled per day would significantly impact the business model of lobstering operations.[97]

Reduced profits would, in turn, make it more difficult for lobstermen to pay for the high capital and operating costs required to operate a ropeless system. The current best estimate is that existing technology for ropeless systems will cost ten times or more per trap compared to gear currently in use.[98] These systems require significant investment in technology, including a computer system, acoustic detector, trigger devices, and rope storage systems. Given the failure rate of current systems, fishermen would also need to invest in redundancy.

Kristan Porter, President of the Maine Lobstermen's Association, traveled to New South Wales in eastern Australia to experience first-hand a commercial lobster operation using ropeless fishing system that has been touted as a model for U.S. fisheries. The business model for the eastern Australia lobster fishery is different than the New England lobster fishery. It is a quota-based fishery with a small number of lobstermen who do not share territory and deploy single traps that are hauled every three to four weeks. The catch is extremely valuable with the price per pound typically six times higher than U.S. lobster price, making this fishery highly vulnerable to poaching. As a result, these lobstermen sought methods to hide gear. Mr. Porter observed:

> On the day we fished, Scott hauled 14 single traps and did not reset most of the gear because he had already caught most of his quota. Scott and his crew were very skilled at fishing the system, particularly in matching each pot to the computer so that it was properly recorded and could be relocated, and the setting of the burn wire in the acoustic release system. He used a torque wrench to perfectly set the bolts on either side of the burn wire to hold it in place; if it was too tight, the wire would break, too loose and the wire would fall out. Either would result in a failure of the acoustic release. This was a highly precise process. Setting the burn wire properly would be difficult to do if handling a high volume of gear or on a day with rough seas.[99]

U.S. fishermen who have tested ropeless gear have raised concern over transferability of this technology to U.S. trap/pot fisheries. Massachusetts lobsterman Dave Casoni tested a ropeless system and worried about the practicability of his peers adopting this technology,

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[97] By way of contrast, the one fishery in the world that uses ropeless gear fishes less than 20 traps per day and does not share fishing territories with other fishermen.

[98] The Oppenheim Declaration, which was filed in *Ctr. for Biological Diversity v. Ross*, Civ. Action No. 18-CV-112-JEB, as Document 115-7 (D. D.C., filed June 18, 2020), at 10 (Addendum F).

[99] https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/March%202018%20Ropeless%20subgroup/kristan_porter_observations_of_ropless_fishing.pdf.

particularly those who are elderly or otherwise have little experience and familiarity with digital technology, touch screens, and other electronic equipment required to operate many pop-up buoy gear systems.[100] Similarly, West Coast Dungeness crab fishermen who have tested ropeless systems found that these systems have an unacceptably high failure rate resulting in loss of expensive equipment, hauling and retrieval were extremely time-consuming, there was inadequate deck space to store ropeless equipment when stacking traps onboard, and gear and catch were lost because traps landed upside down preventing the retrieval of the gear. Fishermen have noted that these issues will be compounded in rough seas and cold weather conditions.[101] Fishermen have also observed that they will have to make extensive, costly modifications to their vessels in order to operate many of the pop-up buoy gear systems that are currently available, requiring new haulers, wiring for electronics, or custom-built platforms or shelving to stabilize gear while it is being re-coiled or re-spooled.[102]

(ii) Ropeless gear presents safety risks.

Ropeless fishing also poses significant safety risks to fishermen in both the Lobster Fishery and fisheries that overlap with it. The increased handling time on deck required by ropeless gear is a particular concern for fishermen who operate their vessels alone. Fishermen who fish alone must handle gear on deck while maintaining a vigilant watch to ensure safe vessel maneuvering within high traffic areas or in a high sea state. Fishermen are very concerned about safety issues surrounding gear conflict due to an increase in gear being set over gear on bottom, or mobile gear unknowingly hauling through fixed gear.

A key function of the surface buoy and vertical line is to allow lobstermen to locate their traps and safely haul them from the ocean floor to the fishing vessel. Another important function is to alert other ocean users of the presence of lobster gear. The removal of the surface system would result in significant conflict among lobstermen and between competing gear types. All of the ropeless systems under-development use unique acoustic release devices, rope storage options, and tracking and communications software. For ropeless fishing to work, all of these systems must be interoperable so location of fishing gear is known to any vessel or law enforcement accessing an area. There are several commercial fisheries that operate within the same fishing grounds as lobster fisheries, including groundfish trawl and gillnet fisheries, crab fisheries, scallop, tuna and shrimp fisheries. Any sunken gear that cannot be detected by other vessels puts the vessel at risk and may result in loss of catch. Mobile gear that unknowingly drags through sunken trap gear can lead to loss of catch by damaging nets and creates serious safety risks to the vessel and crew by hanging down nets and hauling back heavy tangled gear. Similarly, a lobster trawl set over the top of an unknown sunken trap on bottom is very dangerous to haul due to the tremendous strain that is exerted on the line. Often the hauling line will part and the gear and catch will be lost.

A ropeless Lobster Fishery would therefore require all lobstermen, and other fisheries that overlap with lobster gear, to install and successfully operate computer systems to track and detect sunken lobster trawls to avoid gear conflict. Even if the fleet is outfitted with compatible

[100] Oppenheim Declaration at 14 (Addendum F).

[101] *Id.* at 12 (Addendum F).

[102] *Id.*

detection systems, weather or interaction with mobile gear can drag sunken lobster gear from its marked location putting it out of range of the vessel's release unit resulting in loss of gear. This "ghost gear" on the ocean floor is both a risk to protected species and may continue to capture economically valuable target species.

(iii) Ropeless gear presents enforcement challenges.

Ropeless fishing also poses enforcement challenges that must be addressed. In June 2018, ASMFC's Law Enforcement Committee (LEC) reviewed the enforceability of ropeless pop-up buoy gear technologies to reduce impacts on NARW.[103] The LEC concluded that deployment of ropeless gear would significantly impede law enforcement's ability to enforce lobster conservation rules. The concerns identified by LEC include: (1) the time and cost required to retrieve and re-deploy ropeless gear would significantly reduce the number of vessels and traps inspected for compliance; (2) the need to access multiple pop-up buoy gear technologies and retrieval/mapping systems would represent a financial burden and logistical challenge; (3) unanswered questions on systems to be used to store and secure trap location information; and (4) the vulnerability of acoustic and radio frequencies to be hacked or stolen data that lead to illegal hauling of gear by others as presented in Addendum G.

We encourage NMFS to identify these issues for further analysis and investigation in the "Roadmap to Ropeless Fishing." In the immediate term, this technology should be examined for implementation in restricted areas where deployment of buoy lines is not allowed. However, there are significant issues that must be addressed before this technology could reasonably be considered for fishery-wide adoption. These examinations must address the technological, operational, and economic impediments that undeniably exist, and vary significantly depending upon the scale at which the technology is adopted. Collaboration with fishermen, and the associations that represent them, is essential for both understanding these issues and finding appropriate and effective solutions.

2. RPM 2

The Associations agree that it is essential that NMFS work to "identify correlations with environmental conditions or other drivers of incidental take within some or all of the action area." NMFS's current risk assessments are disproportionately weighted to simply assume risk occurs because fishing gear is present. To more accurately assess risk, NMFS must devote more resources to assess the likelihood that whales will be present, and whale behavior, in areas with fishing gear in the first place. In this regard, NMFS should build upon habitat distribution models that have already been developed in other contexts to develop a more sophisticated habitat distribution model for NARWs. Such a model should include the monitoring and integration of variables such as sea surface temperature, plankton distribution, presence of prey, and other factors that explain the temporal and geographic distribution of NARWs. These models should be groundtruthed with whale sightings data. Ecological studies should also include additional monitoring data pursuant to our recommendation on RPM 4.

[103] ASMFC LEC May 2018 meeting summary at http://asmfc.org/law-enforcement/the-law-enforcement-committee; ASMFC May 2018 meeting summary at https://www.asmfc.org/files/Meetings/2018SpringMeeting/2018SpringMeetingSummary.pdf.

The Associations also agree that NMFS must review and assess "all data available on the observed/documented take" of NARW. This review and assessment must include takes that occur in Canadian fisheries and in Canadian waters, and this should be expressly stated in the T&Cs for RPM 2. In this regard, NMFS should use all diplomatic and political means necessary to obtain data from Canada on species distribution, including surveys that allow for individual identification that can be included in models. NMFS should also request data on the density and type of fishing gear deployed (especially snow crab and lobster) in Canadian waters so that it can work effectively with Canada on equitable solutions to reduce risk entanglement.

Finally, we note that RPM 2 states that, after undertaking review, "NMFS must take appropriate action to reduce large whale, sea turtle, Atlantic sturgeon, Atlantic salmon, and giant manta ray interactions and/or their impacts." The Associations agree that appropriate actions should be taken. However, any such action(s) must occur through the legally required processes and cannot occur pursuant to RPMs and T&Cs if they are not limited to "minor changes" that do not "alter the basic design, location, scope, duration, or timing of the action." 50 C.F.R. § 402.14(i)(2).

3. RPM 3

While we recognize that disentangling NARW is dangerous and requires training, the Associations believe that lobstermen would readily volunteer to be trained and serve as first-responders when entangled whales are sighted. Historically, some lobstermen have already received such training.[104] NMFS should also explore new and innovative ideas to improve disentanglement techniques.[105] We recommend that this concept be included in RPM 3.

With respect to the fifth T&C, the Associations recommend that NMFS invest in state of the art technology to provide responders and sightings surveillance teams with high resolution cameras that have a laser scale built in. This would provide the information necessary to determine the type of gear and size of rope, if any, on an entangled animal. NMFS should also provide responders with high resolution drones to obtain better, higher-resolution images of entanglement and any gear associated with an entanglement. Such data is essential to informing management measures tailored to addressing actual risks.

Finally, the T&Cs for this RPM should ensure that the U.S. and Canada incorporate standardized methods and protocols for data collected during disentanglement and chain of custody and analysis of gear removed from NARW.

4. RPM 4

The T&Cs for this RPM require NMFS to "continue to monitor" the fisheries but provide no detail on what type of monitoring should occur or at what levels. We recommend that the T&C include more detailed specifications for monitoring to ensure that monitoring efforts are properly directed and effective. Such monitoring must be targeted to specific fisheries and

[104] See https://www.capecodtimes.com/article/20130716/NEWS/307160322.

[105] See The Nature Conservancy collaborative research project to develop new disentanglement technology. https://www.youtube.com/watch?v=_nj9rATdHQs&ab_channel=TheNatureConservancyinCalifornia.

require specific reporting by fishery and area, which would be included in comprehensive reporting to more accurately assess levels of risk by fishery and area.

NMFS must also increase NARW surveillance within the action area. A recent report by a NMFS expert working group states: "It is clear that long-term satellite tags could help provide valuable data about NARW habitat use, including discovery of unknown foraging areas, return to previously used foraging areas, and other shifts in distribution that might occur."[106] Long-term satellite tags and other methods should be prioritized and funded as possible ways to obtain better surveillance of NARW distribution.

NMFS should fund implementation of 100% harvester reporting by all jurisdictions and develop and implement a cost-effective vessel tracking technology for trap/pot fishery that has been piloted by ASMFC.

5. RPM 5

NMFS should make a concerted effort to employ a more reliable modeling framework that can support future decisions. While some minor improvements to the matrix model are suggested in other sections, the development of an individual-based model should be expedited. In an individual-based model, each individual of a population is tracked and allowed to have unique demographic parameters and follow rules about interactions with other individuals and the environment. In contrast, the assumption of a matrix model is that all individuals represented in a matrix have identical demographic parameters and behavior. In very large populations, the law of large numbers suggests that this assumption of matrix models may be close to the truth, and some significant computational advantage is gained with this assumption. In small populations, however, individual variations in demographic rates can be very important. In the case of NARW, the detailed catalog of individual identifications over long periods of time suggests an individual approach may be beneficial. In fact, the SSMR model takes an individual approach, providing survival probabilities for every individual NARW in the record. The matrix model then sweeps this individual level information into population-wide summary statistics. An individual-based model approach would be much more consistent with the available data and the Pace *et al*. (2017) modeling approach. Indeed, the individual-based model approach appears to be the selected method of the PET Subgroup of the NEIT. Getz (2020) also suggests the use of an individual-based model in their model review.

In addition, RPM 5 must include a direction to NMFS to better investigate and understand sources of NARW natural mortality, particularly for newborn (neonate) calves that are subject to predation. Natural mortality already occurs and is not well understood by NMFS, yet is a critical factor in understanding population growth rates of NARW. Moreover, natural mortality of neonate calves could become a serious problem in the future as white shark populations continue to grow.

IV. CONCLUSION

[106] *See* North Atlantic Right Whale Monitoring and Surveillance: Report and Recommendations of the National Marine Fisheries Service's Expert Working Group (Erin M. Oleson, Jason Baker, Jay Barlow, Jeff E. Moore, Paul Wade) (June 2020), https://repository.library.noaa.gov/view/noaa/25910/noaa_25910_DS1.pdf.

We appreciate the opportunity to provide comments on the Draft BiOp. The Associations are committed to working with NMFS through legal and evaluative processes that are based upon objective assessments of the best scientific data available. As explained above, we have significant concerns about the Draft BiOp, such as its inaccurate portrayal of the effects of the Lobster Fishery through numerous incorrect or overly conservative assumptions. We respectfully request that NMFS address these concerns. We also appreciate NMFS's consideration of our other recommended improvements, such as the construction of a more specific adaptive management framework and proposed refinements to the reasonable and prudent measures. If you have any questions or would like additional information, please do not hesitate to contact Patrice McCarron at 207-967-4555 or patrice@mainelobstermen.org.

Sincerely,

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Senator Jeanne Shaheen (via Sarah Holmes)
Senator Maggie Hassan (via Victoria Williams)

Representative Chris Pappas (via Ashley Motta)
Senator Elizabeth Warren (via Bruno Freitas)
Senator Ed Markey (via Nolan O'Brien)
Representative Bill Keating (via Andrew Nelson)
Representative Seth Moulton (via Olivia Hussey)
Representative Katherin Clark (via Ilina Shaw)
Representative Stephen Lynch (via Megan Hollingshead and Bruce Fernandez)
Senator Jack Reed (via Steven Keenan)
Senator Sheldon Whitehouse (via Karen Bradbury)
Representative David Cicilline (via Matthew McGinn)
Representative James Langevin (via Peter LaFountain)
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Honorable Governor Chris Sununu, Governor of New Hampshire
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Robert Beal, Executive Director, Atlantic States Marine Fisheries Commission

Addendum A

Overview of The Associations

Maine Lobstermen's Association (MLA)

The Maine Lobstermen's Association's (MLA) was founded in 1954 and is the oldest and largest fishing industry association on the east coast. The MLA advocates for a sustainable lobster resource and the fishermen and communities that depend on it. The MLA engages in advocacy, education, stewardship and sustainable resource management, collaborative research and cultural exchange. For more than 65 years, the MLA has ably represented the interests of the Maine lobster industry and educated the public about the importance of this industry.

Massachusetts Lobstermen's Association

The Massachusetts Lobstermen's Association was established in 1963 by the fishermen, for the fishermen, and is presently one of the leading commercial fishing industry associations in New England. On behalf of its 1,800 members, the MALA works to maintain both the industry and the resource. The MALA strives to be proactive on issues affecting the lobster industry and is active in the management process at both the state and federal levels.

MALA has become a trustworthy voice for the industry on important issues and is looked to by both the fishing industry and the management community. The Massachusetts Lobstermen's Association is a member-driven organization that accepts and supports the interdependence of species conservation and the members' collective economic interests.

Atlantic Offshore Lobstermen's Association

The Atlantic Offshore Lobstermen's Association (AOLA) is the sole organized voice for the federal offshore lobster industry, representing a majority of the active fleet with members from New Hampshire to New Jersey. The Association supports the efforts of the offshore lobster industry to develop and maintain a strong, stable, and sustainably minded fishery. Offshore lobster fishing is pursued by a relatively small fleet (approximately 65 active vessels) in an area 40-120 miles from shore that spans from the Canadian border to the mid-Atlantic.

The Executive Director of AOLA has held a seat on the Atlantic Large Whale Take Reduction Team (TRT) since its inception in 1996 and has participated in the development of all Atlantic Large Whale Take Reduction Plan conservation provisions since that time, including provisions undertaken since the 2014 Endangered Species Act Biological Opinion. David Borden has been the AOLA Executive Director since 2013. He also serves as a Commissioner for the Atlantic States Marine Fisheries Commission (ASMFC) with a seat on the Lobster Board. Grant Moore is AOLA's President, alternative TRT member, and Chairman of the ASMFC's Area 3 Lobster Conservation Management Team.

Since 2018 AOLA staff and members have been participants on collaborative research projects to develop whale protections. Work has included load and breaking strength testing of existing vertical lines, testing manufactured 1700lb breaking strength rope and weak rope contrivances, and testing of acoustic release (ropeless) technologies. AOLA members have also provided researchers and managers

with critical information about fishing operations to inform fisheries characterizations, model development, and gear technology specifications.

Maine Coast Fishermen's Association

The Maine Coast Fishermen's Association (MCFA) is an industry-based non-profit that identifies and fosters ways to restore the fisheries of the Gulf of Maine and sustain Maine's iconic fishing communities for future generations. Established and run by Maine fishermen, the objectives of MCFA are to provide a voice for our fishing communities, to rebuild the Gulf of Maine ecosystem, and to support diverse fishing businesses throughout Maine. MCFA strives to ensure that Maine's fishing communities can thrive today, tomorrow, and forever. We do this by advocating for policies and regulations that create healthy and sustainable fisheries, securing access to those fisheries through protecting working waterfront and permit banking, and supporting profitable fishing businesses through research and community development.

New Hampshire Commercial Fishermen's Association

The New Hampshire Commercial Fishermen's Association works to recognize, promote, and encourage all commercial fisheries in the State of New Hampshire in a manner that enhances resource conservation, effective management, wise laws and a friendly spirit of co-operation among all commercial fishermen. The association's members have consistently and currently participate in all aspects of fishery management at levels that effectively contribute to the discussions and outcomes in the best interest of the resource and industry. Our members are active on the Area 1 LCMT, ALWTRT, a variety of ALWTRT rope workshops and initiatives along with ongoing collaborations specific to lobster issues.

Maine Lobstering Union

Maine Lobstering Union (MLU) is a nationally backed organization working through solidarity to bring support to Maine's Lobstermen. The MLU provides education, upholds traditional sustainable lobstering practices and advocates for the fishermen that rely on them. The MLU is dedicated to improving the quality of life for our fishermen. Lobster 207 is the first Union-owned, fair-trade lobster co-op. Our members own their product, "From the ocean floor to your door".

Downeast Lobstermen's Association (DELA)

The Downeast Lobstermen's Association was formed in 1990 by a small group of lobstermen in the Jonesport, Maine area to maintain traditional lobstering for fishermen and their families and to maintain our lifestyle for our future generations. Since its humble beginning, DELA has become known state and nationwide, representing lobstermen from Kittery to Eastport, and from nearby states including New Hampshire and Massachusetts. DELA's members share the same interest and concerns about their fishery. DELA's work includes representing the Maine lobster industry on the Lobster Institute, the Research, Education and Development Board, Maine Fishermen's Forum Board and we collaborate on a variety of research projects with Maine Department of Marine Resources, Gulf of Maine Lobster Research Institute, and more.

Southern Maine Lobstermen's Association (SMLA)

The Southern Maine Lobstermen's Association was formed in 1972 as a non-profit cooperative. SMLA has served southern Maine's commercial lobstermen through the collective purchase of fishing gear and supplies and advocating lobstermen on a variety of regulatory issues. SMLA members have served on the Lobster Advisory Council, the Lobster Research Education and Development board, and as well as collaborative with state and federal agencies on a variety of oceanographic survey, dredging, and collaborative research projects.

Maine Lobster Dealers Association (MLDA)

The Maine Lobster Dealers' Association was formed in 1985 to support the interests of lobster wholesalers and processors. Together with our members, we proactively work towards solutions to the regulatory and commercial challenges in the lobster supply chain worldwide. MLDA's members are the businesses that procure lobster from Maine's commercial lobster fishermen and add value to it by grading it for specific sizes and quality or process it into value-added products like lobster meat or frozen tails. Without our hardworking fishermen, there is no product for us to ship around the world; without live lobster wholesalers and lobster processors, there is no connection between our small coastal towns and the domestic and global market place. We work hand in hand with our commercial fishermen and we are concerned about their fishing future because our member companies and the 6,000 jobs that exist in Maine's lobster supply chain, depend upon a biologically and economically sustainable fishery.

Maine Center for Coastal Fisheries

The Maine Center for Coastal Fisheries (MCCF) mission is to sustain commercial fishing and Maine's coastal fishing communities in eastern Maine and beyond. We are not an association of fishermen, but we are located in Stonington, Maine's largest lobster landing port, and we have several fishermen on our Board of Directors. We conduct collaborative research with fishermen and we are a boundary spanning organization promoting collaborative management strategies that are based on local knowledge and sound science. Our long-term goal is to help transform fisheries management to me more ecosystem-based to be more responsive to natural and social changes affecting fisheries and communities. Dr. Carla Guenther, Chief Scientist is a co-investigator on a current study of the socio-economic stressors on Maine's lobster fishery that is being funded by the National Sea Grant Program. MCCF endorses the comments and concerns that are included in this response to the draft Biological Opinion.

O'Hara Corporation

The O'Hara Corporation is a family held company that has owned and operated commercial fishing vessels for over 114 years. Our home office is located in Rockland Maine, which is the homeport of our 2 Atlantic herring vessels that supply bait to our local lobster communities through our shoreside division of O'Hara Bait.

Maine Aquaculture Association

The Maine Aquaculture Association (MAA) is the oldest state aquaculture association in the country. Founded in 1977, MAA represents the commercial aquatic farmers of Maine. Our members grow 23 different species, and directly employ over 700 Maine citizens in year-round jobs with an additional 300 seasonal employees generating more than 150 million dollars in economic activity annually. The MAA is a co-founder of the Maine Working Waterfront Coalition that served as the model for the creation of

the National Working Waterfront Coalition. In cooperation with a number of environmental advocacy groups (ASF, TU, CLF), MAA developed third party audited environmental management systems designed to reduce the environmental footprint of our farms and minimize any interactions with species listed under the Endangered Species Act.

Addendum B

Economic Importance of the Northeast Lobster Fishery

The Northeast Lobster Fishery has long been an integral part of the region's culture, heritage and economy supporting tens of thousands of jobs and hundreds of ancillary businesses.[1] The fishery remains the most valuable in the United States. In 2019, lobster landed in the states of Maine, New Hampshire, Massachusetts and Rhode Island were valued at nearly $640 million, with Maine and Massachusetts representing 91% of the revenue. The lobster fleet contributed an additional $12 million in Jonah crab landings (Table 1). The lobster distribution supply chain in Maine alone was estimated to contribute $968 million to the Maine economy supporting over 5,500 workers.[2]

Table 1
2019 Ex-vessel Value of Lobster and Jonah Crab

	Lobster	Jonah Crab
Maine	$ 486,639,304	$ 422,041
Massachusetts	$ 94,414,921	$ 8,137,652
New Hampshire	$ 35,428,408	$ 42,406
Rhode Island	$ 10,988,713	$ 3,391,499
Total	$ 627,481,346	$ 11,993,598
Total lobster and crab	$ 639,474,944	
Source: NOAA Fisheries		

For rural coastal communities, the lobster fishery is the economic engine that keeps many small towns alive. The majority of the lobster fleet is owned and operated by a vessel Captain who lives, works, and spends earnings locally. [3] As a business sector, commercial lobstering is a primary economic driver. Each dollar earned by a lobsterman generates several more, generating jobs and economic value for local economies. Overall, he lobster fishery is estimated to contribute more than $2 billion to the region's economy[4]. When lobstermen are paid for their product at the dock, they spend those earnings on everything from meals at local restaurants and gas for their trucks and boats to new traps, boats, and homes in their local communities.

While the lobster fishery is the economic engine of coastal economies, it is comprised of a very diverse fleet of small businesses. The fishery takes place over a vast area under varied bottom habitats and conditions ranging from shallow coastal areas to deep offshore waters. The fleet varies dramatically in vessel size, size of gear fished (traps and rope), gear configuration, number of crew and spatial extent of the fishery.

[1] Maine's lobster fleet directly supports more than 10,000 jobs (3,670 Captains, up to 5,750 crew, 1,095 students)
[2] Donihue, Michael. Lobsters to Dollars: The Economic Impact of the Lobster Distribution Supply Chain in Maine. June, 2018.Colby College at http://www.colby.edu/economics/lobsters/Lobsters2DollarsFinalReport.pdf
[3] Maine Revised Statutes, Title 12, Chapter 619, Subchapter 1, §6431-G
[4] Donihue, Michael. Lobsters to Dollars: The Economic Impact of the Lobster Distribution Supply Chain in Maine. June, 2018.Colby College at http://www.colby.edu/economics/lobsters/Lobsters2DollarsFinalReport.pdf

In 2018, Maine issued 4,830 commercial lobster licenses and 1,095 student licenses[5]. Massachusetts has an estimated 850 active lobster licenses[6], New Hampshire has an estimated 320 active lobster licenses[7]. In 2017, National Marine Fisheries Service reported 2,034 federal lobster trap permits for Lobster Conservation Management Areas (LMAs) managed under the Atlantic States Marine Fisheries Commission. The majority of federal lobster permits (79%) are issued for Lobster Management Area 1 (1,601). In most cases Area 1 federal permit holders also hold a state permit. NMFS issued 107 Area 3 permits with approximately 65 active vessels. [8] [9]

The inshore state waters fleets are comprised of small to medium sized boats that fish several days a week during the spring, summer and fall months in local territories that are close to shore. These inshore coastal fleets are comprised of small vessels (less than 20 feet in length), some operated by students and elderly fishermen, typically with only the Captain aboard. The state waters fisheries also include medium-size vessels (20 to 39 feet in length) which fish out to the state waters three-mile line. These vessels are fished by single operators or carry a small crew of up to two.

Approximately 20% of state waters lobstermen also hold a federal Area 1 permit which allows them to fish in federal waters. Many fish year-round from larger vessels (40 to 50 feet in length) with a crew of two to four sternmen. The Area 3 fleet operates differently from state waters and the Area 1 fishery. An Area 3 fishing trip usually lasts four to ten days aboard vessels ranging from 50 to 100 feet in length carrying a four to five crew.

For more than a century Maine's lobster fishery has been a stable presence along New England's waterfronts. It is an icon of the region, and an integral part of the region's culture, traditions and economy. The future of many New England coastal communities depends upon the continued success of the lobster fishery.

[5] Maine DMR estimates that 70% of commercial licenses are actively fished (cite email from DMR)
[6] Beth Casoni, Massachusetts Lobstermen's Association, personal communication.
[7] Renee Zobel, New Hampshire Fish and Game, personal communication
[8] NOAA Fisheries, 2017 at https://www.fisheries.noaa.gov/permit/american-lobster-permitting-information#:~:text=Only%20one%20federal%20lobster%20permit,stay%20with%20the%20permitted%20vessel.
[9] David Borden, Atlantic Offshore Lobstermen's Association, personal communication.

Addendum C

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

CENTER FOR BIOLOGICAL DIVERSITY, et al., Plaintiffs, v. WILBUR ROSS, et al., Federal Defendants, and MAINE LOBSTERMEN'S ASSOCIATION, INC., and MASSACHUSETTS LOBSTERMEN'S ASSOCIATION, Defendant-Intervenors.	Civil Action Nos. 18-112 (JEB)

Declaration of Glenn Salvador
In Support of Intervenor-Defendants' Remedy Brief

I, Glenn Salvador, state and declare as follows:

1. I have significant first-hand knowledge of New England, mid-Atlantic and Southeast Atlantic commercial fisheries, including knowledge of target species and bycatch interactions, the type of gear and rigging strategies deployed for various fisheries, and operation of vessels and equipment.

2. I have 22 years of professional experience as the Gear Specialist and Fisheries Liaison for NOAA Fisheries (NMFS) serving in this role from 1996 to 2018. I worked for the Northeast Regional office based in Gloucester, MA. In addition to working as NMFS Gear Specialist, I also served as the Fisheries Liaison for the Northeast Fisheries from 1996 to 2002 and Mid-Atlantic Fisheries from 2003 to 2018. My duties included working with fishermen to develop and test gear innovations to reduce the likelihood of entanglement, answering fishermen's questions about how to comply with whale protection requirements, and investigating the source of gear removed from entangled large whales. This work was achieved by attending industry meetings, trade shows and workshops, meeting fishermen on the dock, publishing columns in trade

magazines, and going on commercial fishing trips with regulated fishermen. During all of these years, I worked closely with my counterparts throughout the Northeast, Mid-Atlantic and Southeast regions.

3. I worked as a commercial fisherman for 15 years in the Gulf of Maine, from 1970 to 1985, in the inshore and offshore lobster and gillnet fisheries. I also owned and operated a commercial fishing vessel working in trap and mobile gear commercial fisheries in the West Indies from 1982-1985. I worked briefly as a boat building apprentice in Beals, Maine for two years in the late 1980's, as a field agent and research vessel Captain for the state of Maine Department of Marine Resources from 1987 to 1990, and as a senior at-sea fisheries observer for Manomet from 1990 to 1996 collecting commercial fishing data on east coast fisheries operating from Maine to Florida, including inshore and offshore lobster and gillnet fisheries.

4. I am a certified U.S. merchant marine officer with a 100-ton Master License, a certified Master Fisherman by the World Food and Agriculture Association, and a certified Marine Surveyor by the U.S. Surveyors Association. I have received several awards from the U.S. Department of Commerce including the 2004 Bronze Medal for forging cooperative relationships with fishermen and developing gear modifications; the 2007 Bronze Medal for excellence in managing a fishing gear buy-back program; the 2007 Silver Medal for reducing the bycatch of marine mammals and turtles in commercial fisheries; and the 2016 Bronze Medal for exceptional leadership, innovation and collaborative approach in working with commercial fishermen and stakeholders.

5. As NMFS's Fisheries Liaison, I led the region's collaborative research efforts with fishermen to develop entanglement mitigation strategies that are safe and operationally practical for the fleet. There was strong interest from the fishing community to participate in research to

develop whale-friendly fishing gear and deployment strategies. These projects included documenting operational needs of the lobster and gillnet fisheries, including the loads encountered on lines during hauling and setting of gear and observing vertical and bottom profiles of gear when they are fished. I coordinated many collaborative research projects with fishermen. Gillnet research included modified float lines and lead lines to weaken the net through the use of knots, lighter ropes, weak links and "Chinese fingers." Lobster gear research included testing of low profile ropes, acoustic releases, mechanical weak links, bottom weak links and buoy line messenger systems, gear marking techniques, weak link testing, gear retrieval with lighter buoy lines, low profile groundlines and time tension line cutters. I also conducted a variety of workshops with fishermen including whale disentanglement workshops for fishermen focused on proper identification of whale species and safely executing successful disentanglement strategies for fishermen, and several gear development workshops. I learned early in the process that fisheries are extremely diverse and because of that, there are no simple solutions.

6. I was personally involved in analyzing much of the gear removed from entangled large whales, including North Atlantic right whales. In investigating these cases, I interviewed those who observed the whale entangled at sea, were involved in efforts to disentangle the whale, the necropsy team and the fishermen who set the gear when this information was available. The results of these investigations were included in National Marine Fisheries Service annual *Atlantic Large Whale Entanglement Reports* from 1999 to 2018. [i]

7. There are only a few instances where a right whale has been observed encountering and becoming entangled in commercial fishing gear. This makes analyzing gear removed from entangled whales extremely complicated because we are trying to reverse engineer an

unobserved event. This requires a complex investigation to determine the origin of the fishery (such as country or state/province), the category of fixed gear (such as netting, trap/pot, long line), and the target fishery. The gear team also makes determinations on whether or not the entangling gear was compliant with regulatory requirements. This requires intimate knowledge of the range of surface systems, types of rope used to deploy the gear and the size and scale of the fishing gear, such as traps or nets commonly used in a range of fisheries. Once NMFS received the entangling gear from the disentanglement team, all gear was inventoried, measured and logged. Gear was categorized as part of the surface system (buoys, buoy sticks, highflyers, weak links, etc.) or bottom system (traps, nets, hooks, etc.), ropes were measured by lengths recovered, diameter and unique features (float, sink, lead-lined, etc.), and unique identifying features were noted, such as various flotation devices, knots and splices, gear marking or other elements. Conclusive determinations were challenging because often only a portion of the gear system was retrieved, and many fisheries deploy similar pieces of gear. Identifying the responsible fishery can be determined if identifying marks were retrieved, such as a license number on a buoy, mandatory gear marks, or other distinguishing features.

8. For this declaration I have reviewed the data on gear fishing gear removed from right whales since records were officially maintained by NMFS beginning in 1997. Specifically, I referenced the database prepared by NMFS for the Atlantic Large Whale Take Reduction Team (ALWTRT) as background information for its April 2019 meeting. These data clearly show that since 2010 lobster fishing gear and ropes have been rarely removed from North Atlantic right whales, something that was common prior to 2010. Based on this review and my cumulative professional experience as a gear specialist and commercial fisherman, it is my opinion that the changes in gear and fishing practices in the American lobster fishery implemented in 2009 and

2014 have significantly reduced the risk of the New England lobster fishery to right whales. The largest entanglement threat is now posed by Canadian snow crab gear trap/pot gear.

9. The analysis of fishing gear removed from right whales, for which I was a key member of the investigative team until 2018, indicates that entanglement in New England lobster gear has declined by 90% since 2010. From 1997 through 2010, lobster gear was removed from 10 North Atlantic right whales. In the last decade, lobster gear has been removed from only one right whale, which did not result in a serious injury. The majority of rope removed from right whales since 2010 is large diameter rope that is rarely deployed in the New England lobster fishery. The decline in lobster gear removed from entangled right whales reflects the success of key conservation measures implemented by fishermen, such as sinking groundlines. The 2009 requirement to replace the floating rope deployed between traps with rope that sinks resulted in the removal of 27,000 miles of floating groundlines from New England's waters. Since then, there have been no instances of groundlines removed from entangled right whales.[ii] The 2014 requirement to reduce vertical lines removed an additional 2,740 miles of rope from the water.[iii]

Right Whale Entanglement

10. When a live whale is reported entangled at sea, a response team is deployed to assess the whale and its condition and efforts are made to disentangle the whale. The success of this effort is highly dependent upon weather, location of the whale and complexity of entanglement. Disentanglers attempt to retrieve any gear removed from whales, but this is not always possible. Often gear that is cut in an effort to free the whale will sink to the bottom, or cuts to the gear that are made to simplify the entanglement configuration allow the whale to shed the gear at sea on its own so the gear is not recovered. Any gear retrieved from an entangled whale is turned over to the NMFS gear team which conducts a thorough investigation of the case. A report is prepared

for each case which includes a summary of the case, a description of the gear removed from a whale and conclusions regarding gear type and target fishery when determined.

11. As an example, NMFS entanglement case E02-17 involved an entangled right whale #3530, known as Ruffian, first observed off the Georgia coast during an aerial survey in January 2017 by Florida Fish and Wildlife Conservation Commission (FWC). The case was reported to the Georgia Department of Natural Resources (GA DNR) which responded on scene. GA DNR attached a telemetry buoy to the whale so that it could be relocated for disentanglement the next day. The response team made a strategic cut near the head, and the whale shed the remaining gear the next day. Upon analysis by the NMFS gear team, the gear description noted "451 feet of 5/8" line was recovered with a large conical steel trap (134 lbs) that had empty bait bags, and a partially destroyed plastic funnel. Cut-out areas in the mesh of the trap were consistent with those required in the snow crab fishery per DFO [Canada's Department of Fisheries and Oceans]. Some of the line recovered also has a unique core build that is not used in any known U.S. Atlantic fishery but has been identified in other confirmed Canadian snow crab cases." The gear team commented, "No twine remained in the mesh cut-outs suggesting that the trap was in the water for at least a period of four months per DFO. No trap tag or surface buoy was present to help identify the exact location of the fishery or fishery." The gear team concluded, "Recovered gear is consistent with the Canadian snow crab fishery. Growth on the trap, line and the missing escape vents suggest that the gear was in the water for at least a period of 4 months." This gear is now located at NMFS gear facility in Narrangansett, RI.

12. In my experience, there are many cases in which right whales are reported entangled but are observed gear-free in future sightings. The majority of entanglements do not result in serious injury or death. The 2019 draft Right Whale Stock Assessment (page 142) notes,

"Whales often free themselves of gear following an entanglement event."[iv] Knowlton, et al, 2012, published the first significant research on right whale encounter rates with fishing gear from 1980 to 2009, finding that "Most right whales that become entangled apparently clear themselves of the gear and are left with only scars." This research documented that an average of 98.8% of these right whale encounters with fishing gear do not result in serious injury over the 30 year time series.[v]

Decreasing Trend in American Lobster Gear associate with Right Whale Entanglement

13. My former colleague, David Morin, NOAA Fisheries Large Whale Disentanglement Coordinator, provided a database to the Atlantic Large Whale Take Reduction Team at its April 2019 meeting containing records of right whale vessel strikes and entanglements documented between 2000 and 2018.[vi] This database includes all of the known information on fisheries and gear associated with right whale entanglements during this time period. Earlier versions of these data formed the basis to classify the American lobster fishery as a Category I fishery under the Marine Mammal Protection Act's annual List of Fisheries determination. These data and corresponding categorization established the basis for the formation of the ALWTRT and development of the Atlantic Large Whale Take Reduction Plan (ALWTRP).

14. This database also contains data on vessel strikes which remain a source of right whale serious injury and mortality. From 2000 to 2018, there were 70 documented vessel strikes with right whales. Of these, 33 were attributed to U.S. vessels, 7 to Canadian vessels and 30 were undetermined. Of the U.S. vessel strikes, 16 occurred prior to 2009 when the US ship strike plan was implemented and 17 have occurred since; seven of the latter resulted in serious injury or mortality. Additionally, a right whale calf born in 2020 was struck by a vessel and was last

observed in poor condition. Of the Canadian vessel strikes, 3 occurred prior to 2009; 4 have occurred since. All resulted in serious injury or mortality.

15. Based on my years of experience working as a commercial fisherman and analyzing gear removed from whales for NMFS, it is often difficult to determine the fishery from which the entangling gear originated. While there may be a case to rule out a certain fishery, NMFS does not track that data. For example, a whale sighted with a small piece of netting and section of rope would be reviewed by the NMFS gear team. Without specific identifying marks, the rope could be from any number of fisheries, such as whelk, black sea bass or other fishery. The netting could be from fixed gear or pelagic net fishery. It also is impossible to determine conclusively that the two pieces of gear recovered originated from the same commercial gear deployment. This hypothetical example would likely be determined as "unknown," although there are many fisheries that one could likely rule out.

16. It is important to understand that discussion of "commercial fishery entanglement rates" encompasses a wide diversity of commercial fisheries located in two countries. Of extreme relevance to this court proceeding, it is not synonymous with entanglement rates from the American lobster fishery.

17. From 2000 to 2018, there were 164 documented entanglements representing a range of commercial fisheries in the U.S. and Canada. There were 38 cases for which the entangling gear could be traced to a fishery; 13 of those cases occurred before 2010 and 25 cases occurred over the last decade. These data show two significant trends.

18. The first important trend is the significant decline in right whale entanglements in U.S. lobster gear since 2010. From 2000 to 2010, U.S. lobster gear comprised 45% of known cases (6 cases out of 13). However, since 2010 U.S. lobster gear comprises only 0.04% of known

cases (1 case out of 25). Since 2014, there has been only one entanglement, a non-serious injury, in New England lobster gear. As detailed below, ropes removed during this time period are not characteristic of ropes used in the New England lobster fishery. In my expert opinion, the decline in lobster gear entanglement is due to the success of whale protection measures implemented by lobstermen and a significant distributional shift of right whales into Canadian waters where they encounter Canadian fishing gear.

19. The second important trend is the dramatic increase in right whale entanglements in Canadian trap/pot gear since 2010. From 2000 to 2010, 23% of known entanglements were in Canadian trap gear (3 out of 13). This has increased to 52% since 2010 (13 out of 25). Seven of these recent cases resulted in serious injuries or mortalities to right whales.

20. Gillnet gear also emerged as a known threat to right whales. There has been a slight increase in trend in gillnet gear or netting removed from right whales, with one case documented prior to 2010 and seven cases over the last decade; three of these recent cases resulted in serious injuries. There was also a significant increase in entanglements that could not be attributed to a fishery since 2010. In recent years, the proportion of these cases with no gear present has increased.

21. There has been a significant change in the size of ropes removed from right whales in recent years. Prior to 2010, 84% of rope removed from right whales was smaller than ½" diameter (26 of 31 samples) and representative of ropes that may be deployed in New England's lobster fisheries. Since 2010, the diameter or ropes removed from entangled right whales has increased dramatically. Ropes ½" in diameter or larger now represents 79% of rope removed from entangled right whales (19 of 24 cases), up from 16% in the previous decade. This trend is significant because the New England lobster fishery deploys predominantly smaller ropes. The

most commonly fished rope is of 3/8" diameter, although smaller ropes of 5/16" diameter and slightly larger ropes of 7/16" diameter are also deployed frequently. Maine Department of a Marine Resources conducted a study of New England lobstermen in 2019 which documented that 94% of lobstermen from Maine, New Hampshire, Massachusetts and Rhode Island fish with ropes smaller than ½" diameter.[1]

22. Overall, from 2000 to 2018, there were 164 documented entanglements representing a range of commercial fisheries. Of these 17 were attributed to U.S. fisheries, 21 to Canadian fisheries and 126 were not traced to either country. Of the U.S. entanglements in commercial fishing gear, nine occurred prior to 2010 when major modifications to the Atlantic Large Whale Take Reduction Plan were implemented banning the use of floating groundlines in fixed gear fisheries managed under the plan; eight have occurred since, two of which resulted in serious injury or mortality. Of the Canadian entanglements in commercial fishing gear, 5 occurred prior to 2010 and 16 have occurred since, six of which resulted in serious injury or mortality.

23. I worked on the analysis of entangled right whale 3911, now known as Bayla, that died in 2010. The acute cause of death of this whale was shark predation, although the necropsy team noted significant entanglement trauma on the head, mouth and flippers. The gear team examined approximately 435 feet of 7/16" diameter polypropylene (floating) rope, which had six to seven gangions along this rope with portions of bridles attached. Some of the bridle ends are attached to plastic coated wire mesh, measuring 2" by 2" center to center. This gear is consistent with floating groundline used in the trap/pot fishery prior to April 2009 in U.S. trap/pot fisheries regulated under the ALWTRP. Floating groundline was banned from use in most U.S. trap/pot

[1] This does not include data from the Area 3 lobster fishery. See https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/Meeting%20Materials/Interssional/assessment_of_vertical_line_use__in_ne_trap_pot_fisheries___summer_et_al.pdf

fisheries in April 2019. The gear team did not determine that this entanglement was caused by lobster gear for several reasons because there were several trap/pot fisheries that could not be ruled out. Importantly, there was no surface system or trap tags found to identify the target fishery. This gear had characteristics consistent with several trap/pot fisheries including Canadian lobster, jonah crab or conch.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on June 18, 2020 at Belle Haven Virginia

/s/
Glenn Salvador

[i] NMFS Gear Entanglement reports are located at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/reports/index.html

[ii] The two most recent right whale trap/pot fishery groundline entanglement involved floating and not sinking line. These were right whale 3911 (2010) and right whale 3311 (2011).

[iii] https://s3.amazonaws.com/nefmc.org/NEFMC-PRD-RW-Presentation_Final_rvsd.pdf

[iv] U.S. Atlantic and Gulf of Mexico Draft Marine Mammal Stock Assessment, North Atlantic right whale (*Eubalaena glacialis*): Western Atlantic Stock, 2019 draft report

[v] Knowlton, A.R., P.K. Hamilton, M.K. Marx, H.M. Pettis and S.D. Kraus. 2012. Monitoring North Atlantic right whale *Eubalaena glacialis* entanglement rates: a 30 year retrospective. Mar. Ecol. Prog. Ser. 466:293–302.

[vi] NOAA Fisheries' 2000-2018 Right Whale Incident Data Spreadsheet, located at https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/2000-2018_right_whale_incident_data_3_19_19v.xlsx.

Addendum D

Patrice McCarron

From: Colleen Coogan - NOAA Federal <colleen.coogan@noaa.gov>
Sent: Thursday, April 18, 2019 11:16 AM
To: _NMFS GAR ALWTRP members
Subject: Take reduction target approaches considered

Categories: Purple category

TRT Members and Alternates:

Good morning.

Mike Asaro and I have received thoughtful questions from some of you regarding the take reduction target that we identified in my April 5th email to you all. We thought it would be helpful to share our thinking with you in advance of the meeting.

As we tackled this question, we considered several potential approaches to assigning unattributed mortalities and serious injury to Canada or U.S. fisheries. Below is our assessment of these different approaches.

Approach 1: One approach would be to apply the ratio of gear associated with documented mortalities and serious injuries (M/SI) that has been identified to country's fishery across the unattributed M/SI cases to establish the portion of M/SI that should be assigned to each country. Under this approach, the U.S. contribution to M/SI for the period between 2012-2016 would be about twice PBR (meriting a 50% reduction target). Due primarily to 2016 and 2017 documented entanglements, the U.S. portion of M/SI under this approach would drop during the 2014 - 2018 time period (data are still preliminary) to about PBR.
Discussion: Given the high level of scrutiny that the Gulf of St. Lawrence has been under since 2017 (4 - 6 aircraft actively surveying the Gulf - a fairly closed system so high detection rates) and, the highly recognizable rope used in the snow crab fishery (i.e. gear marking is not required to identify it -even outside of the Gulf of St. Lawrence), takes in the snow crab fishery, particularly within the Gulf of St. Lawrence, have a higher likelihood of being documented and identified than takes in gear from other portions of right whales' range. For example, takes in open waters of the Gulf of Maine, where carcasses can drift further offshore, would be less likely to be detected. Some years, carcasses in the Gulf of Maine or other New England waters are detected with entanglement injuries but no gear. And as you know, even when gear is retrieved, our ability to accurately identify and assign retrieved rope to other fisheries continues to be limited under current gear marking schemes.
Conclusion: Given the many variables that allow us to identify gear on right whales (presence or absence, gear marking or other recognition factors, detection/observer effort overlap with fishery, etc), we do not consider the subset of entanglements with retrieved gear that can be identified to be a representative ratio toward apportioning unattributed M/SI cases. We opted not to pursue this approach.

Approach 2: Apportion PBR and unattributed M/SI according to the fraction of time that right whales spend in each country.
Discussion: This approach is consistent with the 2016 Guidelines for Preparing Stock Assessment Reports. In recent years, up to half of the right whale population appears to spend up to six months, in the Gulf of St. Lawrence. Following the 2016 Guidelines which call for consideration of residency patterns, we could reasonably assign 25% of the PBR to Canada and 75% to the U.S, dropping the U.S. PBR to 0.68.

Similarly, the relative amount of time that North Atlantic right whales are exposed to fishing gear in U.S. waters exceeds that in Canadian waters. Consequently, up to 75% of the unattributed M/SI could be assigned to U.S. gear based on the duration of exposure. The reduction in M/SI following this assignment of PBR would have generated the highest target risk reduction for U.S. fisheries (90 to 93%).
Conclusion: Because our Stock Assessment Reports have not included a determination on the fraction of time North Atlantic right whales spend in U.S. and Canadian waters, we do not have a data-based residency estimate to apply at this time. Additionally, area closures, sinking ground lines, weak links, and other risk reduction efforts taken by U.S. fishermen justify a reduced assignment of the impact of U.S. gear on right whales relative to Canadian gear. Therefore we did not choose to apply this approach.

Approach 3: Apportion unattributed M/SI equally between U.S. and Canada.
Discussion: Although right whales spend more time in U.S. waters, area closures, sinking ground lines, weak links, and other risk reduction efforts taken by U.S. fishermen reduce the impact of U.S. gear on right whales relative to Canadian gear. For most of the period considered in our M/SI estimates - that is, until 2018 - there were no targeted right whale risk reduction measures to prevent entanglements in Canadian fisheries.
Conclusion: This is the approach we took, identified in the April 5th email. Apportioning half of the unattributed M/SI entanglements to U.S. and half to Canada results in a target risk reduction for U.S. fisheries of 60% to 80%.

Additionally, we want to share a few other considerations that shaped out thinking:

- In 2018, Canada implemented new regulations in the Gulf of St. Lawrence to protect right whales from entanglement in the Gulf to fishing gear. These regulations were likely responsible for the decrease in observed entanglements in that area for 2018. If they continue to implement closures and monitoring in this area of high co-occurrence of right whales and snow crab gear, Canadian gear may not be identified as responsible for a greater percentage of take in future years.
- During that same year of intensive monitoring of the Gulf of St. Lawrence, two dead right whales with no gear remaining but showing signs of acute entanglement were observed in New England waters. USCG hindcast models did not indicate these whales came any great distance from where they were documented. Right whale carcasses do decompose quickly in the ocean so given the USCG hindcasts, we cannot attribute these mortalities to Canadian fisheries.
- Right whales have demonstrated high variability in their residency patterns in some of what we previously considered to be key habitats. Although their stay duration in some areas has decreased, surveys and acoustic detections confirm that these habitats have not been entirely abandoned. We need to ensure that our regulations need to include measures that are more resilient to changes in right whale distribution, as well as in fishery distribution patterns. (i.e., they will protect right whales no matter what their residency patterns). Past use and persistent occurrence remains the greatest predictor we have for future distribution.

Canada's involvement in Take Reduction efforts: Under the MMPA, the TRP process does not enable or require Canada to directly participate in the U.S. TRT process. However, bilateral engagement has been amplified and will continue with an eye toward continued and sustainable fishery mitigation measures throughout the North Atlantic right whale population's range.

As has been true since the TRT began deliberations over 20 years ago, we are challenged by our inability to precisely identify how and where right whale entanglements occur. Nearly 100 right whales a year exhibit new scars indicating interactions with rope. Despite numerous efforts and the ongoing guidance of the TRT, we have not been successful at bringing the rate of mortalities and serious injuries in U.S.

fixed gear fisheries as low as needed to meet and sustain the PBR prescribed by the MMPA for such an endangered population. Given the reduced rate of calving, the rapid decline in the North Atlantic right whale population in just a few years, and the evidence of a continued high rate of entanglement, it is our best judgment that both U.S. and Canada must take and sustain additional efforts to reduce the mortality and serious injuries in fisheries.

Thank you all for thinking carefully about our challenges next week, and weighing these considerations. We look forward to working with you in Providence.

Colleen and Mike

--

Colleen Coogan
Marine Mammal Take Reduction Team Coordinator
NMFS, Greater Atlantic Region
978 281-9181

Addendum E

Patrice McCarron

From: Allison Henry - NOAA Federal <allison.henry@noaa.gov>
Sent: Monday, December 28, 2020 8:19 AM
To: Patrice McCarron
Cc: David Morin
Subject: Re: Right whale data request

Follow Up Flag: Follow up
Flag Status: Flagged

Hi, Patrice,

Colleen forwarded you the spreadsheet I was prepping for you and the rest of the TRT members. Along with adding the 2019 events, I did make a few minor corrections to a handful of previous events, so definitely use this updated version for any analysis.

Based on Colleen's email it looks like this will be on the TRT website soon so you'll have a new link to provide.

Happy Holidays to you as well!
Allison

On Wed, Dec 23, 2020 at 4:40 PM Patrice McCarron <patrice@mainelobstermen.org> wrote:

> Hi Allison
>
> Thanks for the note. I was wondering if I got lost in the end of the year shuffle but hadn't found my way to get an email out to check in!
>
> Glad that it is in the works. It would be great if I have it in hand at the new year so I can wrap my head around the official data as we prepare to comment on the next RW SAR and the draft rules and biop.
>
> There are so many iterations in the media that it gets confusing.
>
> As a side issue, it would be good to have a way to cite this data directly (rather than just NMFS) as I am often asked about data sources. For the last year and half, I have been able to send the link to the spreadsheet that Dave gave to the TRT in April. Would be good if we have a common source of info to reference. Not sure if that is possible.
>
> Happy Holidays – I hope you and your family are doing well.
>
> It sure has been one crazy year!
>
> Patrice

****

Patrice McCarron

Executive Director, Maine Lobstermen's Association

From: Allison Henry - NOAA Federal <allison.henry@noaa.gov>
Sent: Tuesday, December 22, 2020 4:04 PM
To: Patrice McCarron <patrice@mainelobstermen.org>
Cc: David Morin <david.morin@noaa.gov>
Subject: Re: Right whale data request

Hi, Patrice,

I promise I have not forgotten this request. I'm just waiting on some sighting history information that hopefully will be coming by next week. I apologize for not checking in with you sooner.

Happy Solstice - I hope everything gets brighter along with the days!

Allison

On Wed, Oct 14, 2020 at 6:04 PM Patrice McCarron <patrice@mainelobstermen.org> wrote:

> Hi Allison
>
> The most recent 'official' data I have access to is the spreadsheet prepared in March 2019 for the April TRT meeting.
>
> It is posted at the bottom of this page:
> https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/April%202019/19_april_2019_trt_meeting.html
>
> It would be great to see all of the data, including non-human, to get a sense of how many there are in that data set. For timing, I'd love it as soon as you are able to do it. I really have no idea what the official data says for the end of 2018 or 2019, so I'd like to get up to speed on where things are truly at.

General fields based off Dave's spreadsheet for consistency sake (to the extent that these are available). But, I'm happy to take whatever you have ready to go.

Date first observed

RW ID/Name

NMFS ID

Location description

Narrative

Initial condition

Exam

Cause (EN, VS, etc)

Fate: MT, SI, NS, PR

Value against PBR

Country of origin

Country of origin conf code

Gear analysis

Gear type

Gear retrieved

Gear analysis

If there are any fishery notes or rope size, that would be great, but I'm guessing that has not all been analyzed.

I really appreciate this.

Thank you!
Patrice

****

Patrice McCarron

Executive Director, Maine Lobstermen's Association

From: Allison Henry - NOAA Federal <allison.henry@noaa.gov>
Sent: Monday, October 12, 2020 12:52 PM
To: Patrice McCarron <patrice@mainelobstermen.org>
Cc: David Morin <david.morin@noaa.gov>
Subject: Re: Right whale data request

Hi, Patrice,

Sorry for the late response. Yes, these data are hard to track and I appreciate you coming to me directly. I'm happy to pull them for you - when do you need them by and what fields are you looking for? I assume the usual basic sighting info (date, general location, narrative) and determination results. Do you want all RW events or just the ones with confirmed human interactions? Since my focus is the whale and its outcome, I'll let Dave (cc'd) add in the relevant gear data to ensure that component is the most up to date as well.

I'm doing as well as can be expected in these crazy times and hope you are as well.

Cheers,

Allison

On Tue, Oct 6, 2020 at 2:17 PM Patrice McCarron <patrice@mainelobstermen.org> wrote:

> Hi Allison
>
> Can you please send me a spreadsheet with the RW serious injury and mortality from 2010 to present (date of most up to date info)?
>
> This information is very difficult to track and I want to be sure I am up to date on NMFS' determinations for these entanglements.

I hope you are well with all that is going on these days.

Thank you.

Patrice

Patrice McCarron

Maine Lobstermen's Association

2 Storer St, Suite 203, Kennebunk, ME 04043

207-967-4555 (office) * 207-205-4544 (cell)

Not a member? Join today! www.mainelobstermen.org

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Allison Henry
Fishery Biologist
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http://www.nefsc.noaa.gov/psb/

Patrice McCarron

From: Colleen Coogan - NOAA Federal <colleen.coogan@noaa.gov>
Sent: Thursday, December 24, 2020 11:55 AM
To: Patrice McCarron
Cc: Allison Henry - NOAA Federal; David Morin - NOAA Federal; Marisa Trego - NOAA Affiliate; Kate Swails; Jennifer Goebel; Jennifer Anderson
Subject: Re: Boston Globe article on RW
Attachments: 2000-2019_right_whale_incident_data_12_23_20v.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Patrice,

Rather than wait until we have the fully vetted 2020 entanglement incident analyses, Allison Henry has provided the attached 2000 to 2019 updated right whale incident data. We will share with the full team early in the New Year.

This includes all incidents, not just entanglements, and not all listed incidents are serious injuries and mortalities so as usual please note the column header descriptions and caveats (described in the first two tabs) when filtering the data.

We agree with you that Dave Abel's reported numbers are not supported by these data.

Thanks to Allison for getting this to us!

And Merry Christmas, hope you and your family have a happy and healthy 2021!

On Fri, Dec 18, 2020 at 4:57 PM Patrice McCarron <patrice@mainelobstermen.org> wrote:

> Hi Colleen
>
> I just read Dave Abel's article on RW in the Globe from December 17, and I question a few of the facts in his piece. Unfortunately, I do not have access to the most up to date data, so I am not able to do that on my own. Are you able to clarify whether or not these statements are fact?
>
> "Over the past decade, the population of right whales has plummeted by more than a quarter, and millions of vertical buoy lines used in the Gulf of Maine have been the leading cause of death"
>
> I am not aware of any data that indicates that "millions of VBL used in the GOM have been the leading cause of death."

“Between 2010 and 2019, 43 right whales were found to have died as a result of entanglements from the lines that extend from buoys at the surface to traps on the seafloor, according to the National Marine Fisheries Service. By contrast, 14 are known to have died as a result of vessel strikes.”

The table that Dave Morin shared with the TRT for the April 2019 meeting shows from 2010 to 2018, there were 23 ENT mortalities and 20 VS mortalities. The numbers cited by Abel don’t seem to make sense in light of the data from last year. Can you clarify if Abel’s numbers are accurate?

Here is a link to the article, which I’m sure you have already read.

https://www.bostonglobe.com/2020/12/17/metro/major-effort-protect-endangered-whales-state-officials-plan-ban-lobster-fishing-several-months-year/

I appreciate your feedback on this. Thank you Colleen!
Patrice

****

Patrice McCarron

Executive Director, Maine Lobstermen’s Association

President, Maine Lobstermen’s Community Alliance

207-967-4555 office * 207-205-4544 cell

2 Storer St, Suite 2013, Kennebunk, ME 04043

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Colleen Coogan
Marine Mammal Sea Turtle Team
NMFS, Greater Atlantic Region
Desk: 978 281-9181
Cell: 978 675-5562 - if texting please identify yourself in initial text
ALWTRT current webpage
ALWTRT archived pages
MARINE ANIMAL HOTLINE: 866-755-NOAA (6622)

Addendum F

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

CENTER FOR BIOLOGICAL DIVERSITY et al., Plaintiffs, v. WILBUR ROSS, et al., Federal Defendants, and MAINE LOBSTERMEN'S ASSOCIATION, INC., and MASSACHUSETTS LOBSTERMEN'S ASSOCIATION, Defendant-Intervenors.	Civil Action Nos. 18-112 (JEB)

Declaration of Noah Oppenheim
In support of Intervenor-Defendants' Remedy Brief

I, Noah Oppenheim, state and declare as follows:

1. I am the Principal of Homarus Strategies, a Limited Liability Corporation formed in April 2020. Homarus Strategies is a consulting firm focused on enhancing marine resource sustainability and productivity, supporting coastal communities and their access to the living marine resources on which they depend. Homarus Strategies is engaged in work on behalf of commercial fishing organizations to support their engagement in public processes that pertain to the prosecution of fisheries and to ensure that their voices are heard by decision makers whose experience rarely includes the perspectives or expertise of professional fishermen who have spent their careers working at sea.

2. I am a marine scientist and fisheries policy expert who has worked as a federal fisheries observer in the fixed and mobile gear groundfish fisheries in the Bering Sea and as a commercial salmon fisherman in Alaska. I received master's degrees in marine biology and marine policy from the University of Maine's School of Marine Sciences. The focus of my graduate research was the American lobster fishery in New England. I developed a population dynamics model forecasting lobster fishery recruitment and commercial harvest for fishing areas from Rhode Island to New Brunswick, Canada based on a survey of larval lobster abundance and environmental factors

including warming ocean temperatures driven by climate change. I also studied the perceptions and utility of scientific information and fishery management policies from the perspectives of lobster fishermen for whom scientific information is sometimes intended but often not appropriately designed or scaled.

3. During my graduate studies from 2013-2016 involving research on the American lobster fishery, I became familiar with various measures implemented to reduce entanglement risk to large whales from lobster gear, including the use of colored line marking to identify gear with its fishery of origin, weak links, the use of line that sinks rather than floats between traps set on bottom, and regulatory requirements for trawling (colloquially known as 'trawls' or 'gangs') multiple traps on bottom that are connected to a buoy at the surface via a vertical line at one or both ends of the trawl. I also became familiar with measures being developed or proposed to further reduce alleged whale entanglements in the American lobster fishery, including 'cutter' systems, expansion of weak link systems in buoy lines and the development of 'pop-up buoy gear' (also known as 'on-call', 'ropeless', or 'buoy line-less' gear, although a majority of such systems include buoys and one or more segments of rope). During my studies I engaged with numerous commercial lobstermen, marine scientists, and fishery managers about the various regulatory and technological proposals to address whale entanglement in the lobster fishery, including the viability of using pop-up buoy gear.

4. Pop-up buoy gear is class of fishing equipment that removes or greatly reduces static vertical lines in the water column as a gear retrieval system and instead uses various alternative buoyancy mechanisms and communications technologies to mark the location of fixed gear, identify the owner/operator of the gear, and retrieve the gear. Most prototype or commercially available pop-up buoy gear equipment uses the submersion of a buoyancy device and acoustic signaling to actuate the surfacing of the buoyancy device. Pop-up buoy gear can be divided into two primary types or classes: 'lift bag gear' which uses compressed air (for example, SCUBA tanks) to fill a bag to bring submerged gear to the surface for retrieval; and 'remote coupler gear' which uses coiled or spooled lines and buoys that are released from traps or separate weighted

anchors to reach the surface using a timed-release mechanism or after receiving an acoustic signal (Figure 1). Some remote coupler-type pop-up buoy gear systems require the use of a destructible component that must be reloaded for re-use. Many pop-up buoy gear systems require the use of GPS-based mapping platforms, specialized networked telecommunications equipment, acoustic modems for transmitting coded acoustic signals, and specialized equipment for re-coiling, re-arming, or re-deploying the equipment.

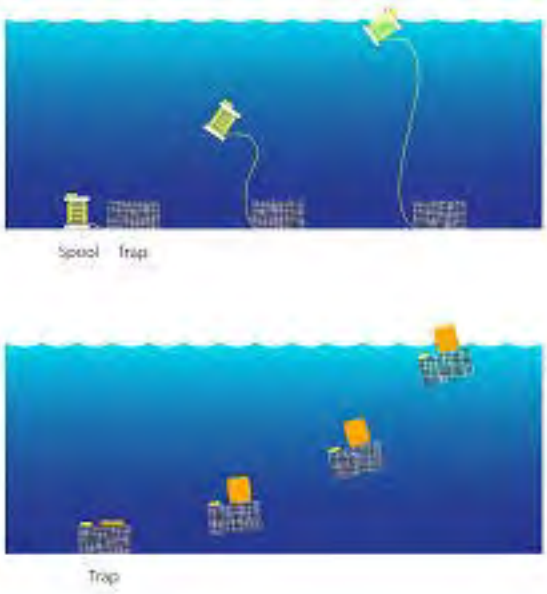

Figure 1: A diagram illustrating two types of pop-up buoy gear systems. The top diagram illustrates remote coupler gear and the bottom diagram illustrates lift bag gear. Accessed from the California Ocean Protection Council website at www.opc.ca.gov.

5. From January 2016 through January 2017 I was a Sea Grant Policy Fellow in the US Congress. During this time, I was responsible for the natural resources portfolio in the office of Congressman Jared Huffman, at the time the Ranking Member of the Water, Power and Oceans Subcommittee of the House Natural Resources Committee. My duties as Policy Fellow included legislative development, office and committee engagement on state and federal fisheries policy matters, assistance with executing the oversight functions of the Congress over the National Oceanic and Atmospheric Administration ("NOAA") (including the National Marine Fisheries

Service or "NMFS"), and engaging with the constituents of California's second congressional district.

6. During my tenure with Congressman Huffman I became aware of the issue of whale entanglement in the west coast Dungeness crab fishery as well as various proposed solutions to minimize and mitigate interactions between ESA-listed whales and Dungeness crab fishing gear. During this time I became aware of the existence of proposals to test pop-up buoy gear in Dungeness crab fishing grounds, as well as the proposals by some non-governmental organizations to mandate its use in the Dungeness crab fishery.

7. From February 2017 to April 2020 I was the Executive Director of the Pacific Coast Federation of Fishermen's Associations ("PCFFA") and PCFFA's sister organization, the Institute for Fisheries Resources ("IFR").[1] In that capacity I directed all of PCFFA's and IFR's fishery management policy, environmental advocacy, and litigation in support of the commercial fishing communities of the West Coast. IFR and PCFFA are especially engaged in legal action to prevent harm to the living marine resources on which their members depend as well as to prevent the implementation of policies that unduly or arbitrarily preclude their access to those resources.

8. In the course of executing my responsibilities at PCFFA and IFR I engaged with numerous Dungeness crab fishermen about their experience with and concerns about pop-up buoy gear. I worked closely with two Dungeness crab fishermen who have first-hand knowledge of buoy-less or pop-up buoy gear systems which they tested from their vessels.

[1] PCFFA is a 501(c)(5) nonprofit trade association established in 1976. PCFFA is the largest trade organization of commercial fishing families on the west coast. PCFFA is a federation of 15 smaller commercial fishermen's associations, vessel owners' associations, port associations, and marketing associations, with member associations in most major ports in California north of Point Conception. Collectively, PCFFA's port and member associations represent approximately 750 commercial fishing families West-Coast-wide who are small and mid-sized commercial fishing boat owners and operators, most of whom derive part or all of their income from the harvesting of Dungeness crabs.
IFR is a 501(c)(3) non-profit, public interest marine resources protection and conservation organization incorporated in the State of California which is closely affiliated with PCFFA and with similar Board structure, general membership, and staff. IFR was created in 1993 by PCFFA to help fund, manage, and advocate for PCFFA's fisheries habitat conservation and restoration agenda, particularly for protecting and restoring and improving fisheries that have suffered from poor inland and coastal water quality and the impacts of climate change including drought and harmful algal blooms. IFR has many supporting members coastwide, most of whom are commercial fishermen and women, or individuals who have a personal interest in protecting fish and the integrity of seafood markets.

9. In my position as Executive Director of IFR, I also supervised and directed all of IFR's many fisheries conservation programs in Oregon, Washington, and California. Much of IFR's work focuses on efforts to restore and protect fishery resources within the coastal waters and watersheds of these three states. IFR, in particular, has been an active and important voice in habitat protection and restoration issues coastwide for the benefit of increased harvest of public trust fishery resources. I am currently the commercial fishing representative to the Pacific Fishery Management Council's Habitat Committee.

10. The California Dungeness crab fishery and the New England lobster fishery are similar in many respects. Each are considered models of sustainable fishery management in their region and populations of Dungeness crabs and lobsters are stable and healthy throughout core ranges of both fisheries. These fisheries have developed similar management strategies that are implemented through differing management measures. Each have systems of limited entry, trap limits, size limits and protections of females or gravid females. The economic model for both fisheries is dependent upon a high volume of landings, requiring significant effort by repeatedly retrieving and redeploying traps. Dungeness crab fishermen can haul and redeploy 300-400 traps per day which is similar to some Maine lobstermen who fish further from shore on larger vessels in order to remain competitive. Others, who fish in smaller boats closer to shore, would haul on average 200 or less traps per day.

11. Both the California Dungeness crab fishery and American lobster fishery are required by law to affix a buoy attached by a line to enable the location of gear, identify the individual to whom the gear belongs, and to provide a mechanism by which to retrieve the gear from the seafloor. While the lobster fishery allows for the deployment of multiple traps on bottom, known as a 'trawl' or a 'gang', this practice is unlawful in the Dungeness crab fishery. In the Dungeness crab fishery, each line and buoy setup is coiled and placed entirely within its corresponding trap to maximize stacking volume and to increase safety and handling efficiency on deck (Figure 2). A typical Dungeness crab trap, line, and buoy costs around $200. An equivalent set-up in the New England lobster fishery also costs around $200.

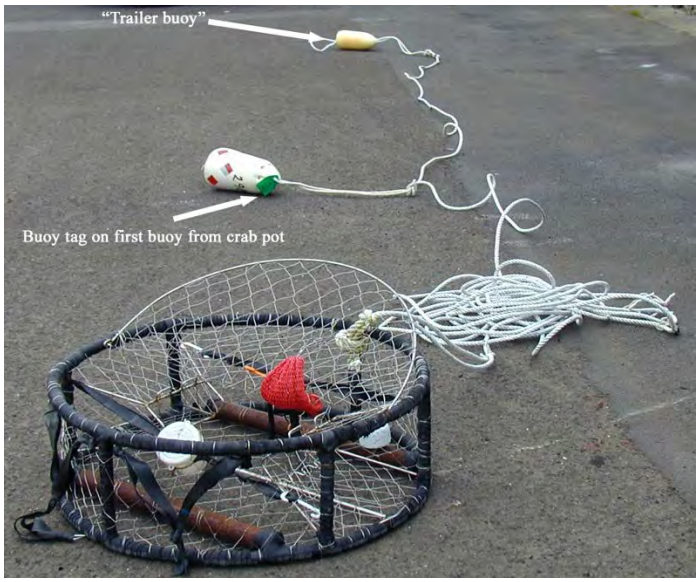

Figure 2. A standard West Coast Dungeness crab trap with main buoy and single trailer buoy setup indicated. Source: Oregon Department of Fish and Wildlife.

12. In California, Dungeness crab fishing occurs from November 15th to July 15th. Frequent intense storms and strong currents throughout the water column can flip and transport fishing gear and mobilize the ocean substrate to such a degree that traps become buried in the sand, often requiring the use of specialized high-velocity water pumps to retrieve them; the nozzles attached to these pumps must 'chase' a line with a buoy to a stuck trap in order to retrieve it.

13. The American lobster fishery is open year-round with the exception of targeted closures implemented to protect North Atlantic right whales. However, the majority (~80%) of Maine lobstermen hold only state licenses and thus are limited to fishing in state waters located within 3 miles from shore. These vessels typically fish from May through November. Those who hold federal American lobster permits are more likely to fish year-round. Lobstermen who fish in the Outer Cape Cod area and in Downeast Maine also work in areas with intense bottom currents and tides which requires additional ballast to hold gear in place and prevent gear loss.

14. A marine heat wave in the Pacific Ocean that began in late 2013 and persisted for three years affected the timing and distribution of marine mammals off the coast of California. It also caused an increase in the abundance and toxicity of various *Pseudo-nitzschia* plankton species

which are sometimes known to produce elevated levels of the potent neurotoxin, domoic acid. Concentrations of domoic acid exceeding US Food and Drug Administration (FDA) action levels were detected in Dungeness crabs prior to the scheduled opening of the 2015/16 commercial fishing season in November, resulting in five month delay and a phased-in opening of the fishery. This resulted in a significantly greater than normal concentration of fishing gear that corresponded with a very early springtime migration of endangered humpback whales. The whales swam abnormally close to shore in search of forage, resulting in a high level of interactions between fishing gear and humpback whales. According to NOAA, there were 19 confirmed entanglements of humpback whales with California Dungeness crab fishing gear in 2016, compared with an average of 0.84 confirmed entanglements with humpback whales over the previous thirteen years (2003-2015).

15. In September 2015, the California Department of Fish and Wildlife (CDFW), in partnership with California Ocean Protection Council and National Marine Fisheries Service, established the California Dungeness Crab Fishing Gear Working Group ("Working Group") to address an increase in large whale entanglements in Dungeness crab fishing gear. From July 2019 to April 2020 I was a member of the California Dungeness Crab Fishing Gear Working Group ("Working Group") which developed fishing gear best practices to reduce entanglement risk. The Working Group identified four factors that served as primary indicators of increased risk of entanglements between ESA-listed whales and commercial fishing gear to be used in a management framework called the Risk Assessment and Mitigation Program ("RAMP").

16. In October 2017 the Center for Biological Diversity (CBD) filed a lawsuit against the California Department of Fish and Wildlife (CDFW) alleging that continued management of the California Dungeness crab fishery violated the ESA due to the occurrence of 'take' of ESA-listed Distinct Population Segments (DPS) of humpback whales and other listed species absent an Incidental Take Permit ("ITP").[2] In November 2017 the PCFFA Board of Directors voted to seek

[2] *CBD v. Bonham*, US. Dist. Ct. California, N. Dist, No. 3:17-cv-05685-MMC ("*CBD v. Bonham*")

to join *CBD v. Bonham* as Defendant-Intervenors. In March 2018 PCFFA's motion to intervene was filed and subsequently approved.

17. In July 2018 I participated in a meeting convened by pop-up fishing gear proponents with fishing industry members, CDFW Law Enforcement Officers, and pop-up gear manufacturers. The meeting included presentations from the manufacturers of 'remote coupler' and 'lift bag' systems and discussions about the various impediments and problems with each system, including challenges of use on board vessels, challenges with the interaction of pop-up buoy gear with mobile and other fixed gear, and challenges for law enforcement officers regarding location, retrieval, and redeployment of pop-up gear.

18. In November 2018 CDFW announced it would develop a Habitat Conservation Plan pursuant to an application for an ITP for its management of the Dungeness Crab Fishery. In March 2019, Judge Maxine Chesney of the US District Court in San Francisco informed the parties to *CBD v. Bonham* she was inclined to rule in favor of the plaintiff's motion for summary judgment resulting in a settlement agreement for a stay agreement signed by all parties dated March 26, 2019. CBD attorneys insisted on the inclusion of provisions to the stay agreement for certain fishing areas to be "only open to ropeless fishing gear by default" and for "[CDFW to] continue to support development of ropeless gear technology, or any other alternative gear, and explicitly allow for its testing and use in the RAMP regulation"[3]. Further, the settlement requires CDFW to "…amend existing regulations or finalize new regulations by November 1, 2020, that allow alternate gear, including ropeless gear, that meets the enforcement criteria to be used in any area closed to commercial Dungeness crab fishing to protect whales or sea turtles"[4].

19. In April 2019 I attended the Atlantic Large Whale Take Reduction Team meeting and engaged with New England lobstermen, scientists, agency staff, and environmental nonprofit organization staff about risk assessment and mitigation approaches in the New England lobster

[3] Case 3:17-cv-05685-MMC Document 71 Exhibit A pp. 2
[4] *ID.* at 4.

fishery. I specifically explored the state of knowledge and engineering development of pop-up buoy gear.

20. I am familiar with three California commercial Dungeness crab fishermen who have tested pop-up buoy gear systems on their vessels. I have worked extensively with two of them, Captain John Mellor of San Francisco and Captain Dick Ogg of Bodega Bay, to understand their experience testing this gear and its potential as an entanglement mitigation strategy that can be scaled across the fishery. Each of these fishermen has experienced operational and technical challenges with this gear and have stated that they do not believe pop-up buoy gear is compatible with commercial fishing as it currently exists.

21. Mr. Mellor tested the FioBuoy (spooled line) and Desert Star (line-in-bag) pop-up buoy gear systems affixed to his Dungeness crab traps in San Francisco Bay, California, a sheltered area with limited wave action, in shallow water at slack tide with little wind (atypical conditions for the Dungeness crab fishery).[5] He successfully deployed and retrieved each type of pop-up buoy gear once. He noted that on the final deployment it became difficult to determine the location of the buoyant float released from the trap because the tide had begun to run slightly. He reported that he does not believe the equipment he tested to be compatible with his fishing operation because the equipment was difficult to handle, there is no spatial mapping software platform or package that would enable him to confidently track the deployment and retrieval of his gear, and the equipment was neither robust enough nor compact enough to fit inside his traps for stacking or handling the rigors of loading and unloading or repeated deployments.

22. Mr. Ogg also tested the FioBuoy and Desert Star pop-up buoy gear affixed to his Dungeness crab traps in the ocean waters off the coast of Bodega Bay, California in shallow water with relatively calm sea state conditions. In his first deployment of the FioBuoy system, he was unsuccessful in activating the gear's release mechanism, but successfully activated the release mechanism on a second attempt. He also deployed the Desert Star system, successfully

[5] Fiobuoy at http://fiomarine.com/; Desert Star at https://www.desertstar.com/

establishing communication with the system and confirming the activation of the release mechanism, although the buoy was not released by the system. He was unable to retrieve the gear and attempted to have the gear retrieved by a SCUBA diver. Unfortunately, this gear was lost and is now a piece of marine debris. Mr. Ogg believes the Desert Star gear may have landed underneath his trap when it contacted the seafloor or that current may have caused his trap to roll over on top of the pop-up buoy gear. It is common in fixed gear fisheries for traps to land upside-down or roll over. The successful retrieval of the pop-up buoy systems he tested is dependent upon the gear landing on bottom in a stable upright position. Based on his experience, Mr. Ogg believes that gear loss resulting from this system would be a common and costly occurrence under normal fishing conditions.

23. Mr. Mellor, Mr. Ogg, as well as many other Dungeness crab fishermen who are familiar with pop-up buoy gear, have described the problems and challenges they see with the use of the gear. Many of these problems and challenges pertain to the ease of use of the systems, including but not limited to the amount of time necessary to use them on board their fishing vessels.

24. Pop-up buoy gear systems are currently, or foreseeably, unreliable and cost prohibitive. Current commercial units cost 10 times or more per trap compared to gear they currently use. Fishermen would also have to purchase or lease expensive electronic equipment to arm and retrieve pop-up buoy gear. For example, if a California Dungeness crab fisherman who owns a tier 1 permit were required to purchase $5,000 pop-up buoy units for each of her 500 traps, she would incur a cost of $2,500,000. This same fisherman would have to reduce the number of traps she fishes from 500 to 20 if she wished to maintain the same budget for fishing gear after switching to pop-up buoy gear. The economic model could not be supported by the fishery.

25. Fishermen have observed that they will also have to make extensive, expensive modifications to their vessels in order to operate many of the pop-up buoy gear systems that are currently available, requiring new haulers, wiring for electronics, or custom-built platforms or shelving to stabilize gear while it is being re-coiled or re-spooled.

26. Mr. Ogg and other fishermen are concerned that the pop-up buoy gear systems that have been tested have an unacceptably high failure rate, resulting in losses of very expensive equipment. The typical failure or loss rate of traps for the California Dungeness crab fishery over the course of a seven month fishing season is around 1.5%. A fisherman might typically cycle through his or her gear twenty times in a typical season, meaning that the failure or loss rate of a typical Dungeness crab trap can be estimated to be around one in 1,250 trap pulls. I am not aware of any existing pop-up buoy gear systems that have a failure rate within two orders of magnitude of 'traditional' line and buoy gear configurations when affixed to Dungeness crab or American lobster traps.

27. Increased losses of fishing gear due to the failure of pop-up buoy gear to deploy when signaled would occur if such gear were put into widespread use today. Marine debris resulting from lost 'ghost gear' is a recognized problem in fixed gear fisheries and may pose entanglement risk to whales.

28. The Ropeless Fishing Consortium was organized to advance the development of fishing with pop-up buoy gear as a right whale entanglement mitigation solution. The group has held three workshops in 2017, 2018 and 2019. Dr. Mark Baumgartner of Woods Hole Oceanographic Institute (WHOI), a founding member of the group, made two significant observations during the 2019 meeting in response to his question, "When can we go ropeless?" He observed, 1) "We are in the early stages of development – mostly proof of concept with prototypes that are not yet designed for operational fishing by hundreds to thousands of fishermen," and 2) "Every system you have seen today will need to go through a redesign process to (a) incorporate an interoperable gear location system, (b) work for fishing at scale (e.g., ruggedized design, long endurance), and (c) enable mass production at low cost."[6]

29. NOAA Fisheries released a concept paper in 2010 to investigate the feasibility of piloting the use of buoy line-less gear in the Great South Channel Restricted Area (GSCRA)

[6] Slide 12 located at https://ropeless.org/wp-content/uploads/sites/112/2019/11/21.-Baumgartner_nearterm_developments_for_distribution_20191113.pdf

which is already closed to trap/pot and gillnet fishing under the Atlantic Large Whale Take Reduction Plan (TRP). NOAA did not support moving forward with rulemaking to allow buoy line-less gear to be fished in this closed area citing several reasons including: 1) the potential increase in risk to large whales from a malfunctioning device (e.g. vertical line present in the water column for a period of time) compared to the current status quo (i.e. closure), 2) the lack of creation of an incentive to develop innovative gear, 3) the potential for gear conflicts, 4) the lack of viable technologies or methods for fishing without buoy lines, and 5) the need to address regulatory hurdles under the American Lobster Fishery Management Plan and ALWTRP. NMFS concluded that development of fisheries management measures that would include the use of buoy line-less gear could be explored in the future if the gear conflict and other regulatory issues associated with its use were addressed.[7]

30. Based on conversations I have had with fishermen who have tested this gear in both California and New England, the issues identified by NOAA in 2010 have not been addressed at this time. Fishermen continue to observe that the operation of pop-up buoy gear systems significantly slows the pace of fishing operations, poses safety challenges, and challenges their ability to operate in a safe, cost effective manner. Fishermen are concerned that there are specific times at which gear handling would be adversely time-consuming: 1) during retrieval and re-spooling or re-coiling of gear, 2) during re-arming or resetting of the pop-up release mechanism itself, 3) during use of any electronic equipment used to arm, set, or locate the gear, and 4) during the time spent searching for gear that has been moved due by the current. Increased handling time is exacerbated by cold weather operations, which are common in both the Dungeness crab and American lobster fisheries. Cold weather significantly decreases fine motor function and requires the use of gloves, which must be removed to arm most pop-up buoy gear systems and to operate the interfaces of the electronic equipment used to track deployment locations and transmit acoustic signals from vessels to the gear. The increased handling time on

[7] https://archive.fisheries.noaa.gov/garfo/whaletrp/trt/meetings/Mid-Atlantic_Southeast_ALWTRT_Materials/Final%20Lineless%20Concept%20Paper%20Nov2010.pdf

deck required by pop-up buoy gear is a particular concern for fishermen who operate their vessels alone. Fishermen who fish alone must handle gear on deck while maintaining a vigilant watch to ensure safe vessel maneuvering within high traffic areas or in a high sea state; several such fishermen have communicated to me that they would be concerned for their personal safety if they were to have to use pop-up gear and fish alone. In 2018, 1,390 Maine lobstermen were Class 1 lobster license holders, which does not allow them to take crew.

31. A Maine commercial lobster fisherman, Kristan Porter, (President of the Maine Lobstermen's Association), tested the Desert Star System in 2013 during a research trip to eastern Australia to investigate potential whale entanglement mitigation tools for the American lobster fishery. This technology was adopted by some fishermen in the Australian rock lobster fishery to hide gear from poachers because each trap in that fishery is set out for 30 days and each trap haul is worth thousands of dollars. The Australian rock lobster fishery is the sole fishery that operates within lobster fishing grounds, negating gear conflict between fishing sectors. Mr. Porter hauled 14 single traps during his fishing trip there, whereas he typically hauls around 200 per day in the Maine lobster fishery. He reported fishing the pop-up system to be time consuming, frustrating, and tedious. Operation of this equipment required a high level of skill to properly record each gear set in the system, and to reset the burn wire for the acoustic release after each haul. Mr. Porter met others in the Australian lobster fishery who were not able to successfully fish the system. He noted that this technology would not easily transfer to the New England lobster fishery because the system greatly limits that number of traps that can be hauled in a day, lobstermen fish much more tightly together, share bottom with other lobstermen and with fishermen active in other fisheries.[8]

32. A Massachusetts lobsterman, Dave Casoni, has tested the Desert Star pop-up buoy gear on several occasions from his fishing vessel. Mr. Casoni has expressed concerns about the

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8 https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/March%202018%20Ropeless%20subgroup/kristan_porter_observations_of_ropless_fishing.pdf

practicability and use of pop-up buoy gear systems on his fishing vessel and those of his peers. Mr. Casoni fishes without a hired crew member and does not feel that pop-up buoy gear would be safe or workable for fishermen operating alone. Additionally, Mr. Casoni has identified the technologies used in pop-up buoy gear systems he is familiar with as highly complicated when compared to the relatively simple technology of a traditional buoy line setup. Many commercial lobstermen are elderly or otherwise have little experience and familiarity with digital technology, touch screens, and other electronic equipment required to operate many pop-up buoy gear systems. Mr. Casoni believes that a significant number of commercial lobstermen would be unable to operate the pop-up buoy gear systems he is familiar with. Required use of these systems would preclude a significant segment of the lobster fishery from being able to participate, based to a large extent on their age and familiarity with certain modern technologies.

33. The Atlantic States Marine Fisheries Commission (ASMFC) has jurisdiction over the Fishery Management Plan for American Lobster, Amendment 3 and its addenda, under the Atlantic Coastal Fisheries Cooperative Management Act. In June 2018, ASMFC's Law Enforcement Committee (LEC) reviewed the enforceability of pop-up buoy gear technologies under consideration to reduce impacts on right whales. The LEC raised several concerns about the impact of pop-up buoy gear technology on the enforceability of lobster conservation rules. The LEC found that the time and cost required for enforcement officers to retrieve and re-deploy pop-up buoy gear would significantly reduce law enforcement agencies' ability to ensure compliance with fishery regulation and lobster conservation laws because gear could not be hauled regularly, resulting in fewer lobster traps inspected per trip, reducing incentives for compliance. The LEC noted that the adoption of multiple pop-up buoy gear technologies and retrieval/mapping systems would represent a financial burden to law enforcement agencies and a logistical challenge for law enforcement, which would need to be equipped to deal with different systems. There were concerns raised about the storage and security of trap location information and the potential for poachers to steal other's acoustic data and unlawfully activate pop-up buoy gear.

34. The widespread deployment of pop-up buoy gear in commercial lobster fishing grounds would result in significant conflict amongst fishermen and between competing gear types. These conflicts reflect both the spatial incompatibility of mobile gear (trawl gear, troll gear) and other types of fixed gear (gillnets, longlines, and 'traditional' trap equipment) with pop-up buoy gear that is unmarked at the surface. There are several commercial fisheries that operate within the same fishing grounds as lobster fisheries, including groundfish trawl fisheries, crab fisheries, and scallop fisheries. The deployment of pop-up buoy gear in a fixed gear fishery would require that all other fisheries operating in the area to purchase and use expensive electronic mapping and communications equipment in order to be able to detect and avoid traps deployed with pop-up buoy gear. Alternatively, it would require the delineation of zones of the ocean for specific fisheries or gear types, prioritizing access to resources to some and denying it to others.

35. I am not familiar with any fishery management or marine spatial planning process that could legally facilitate an ocean zoning scheme that would prevent gear conflict between fishing sectors if one or more were required to use pop-up buoy gear. An ocean zoning process that excluded commercial fishing in one or more sectors solely because of the presence of a gear type from another fishery could be in violation of the guiding principles of the Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§1801 *et seq.*) that call for maximized efficiency in the use of the nation's fisheries resources. It is my opinion that the prevention of the efficient operation of mobile and fixed gear fisheries in areas of the US Exclusive Economic Zone in which pop-up gear is deployed would constitute inefficient management of the nation's fishery resources.

36. In addition to the challenges of conforming to fishery management principles espoused in federal statute, any requirement to use of pop-up buoy gear in the American lobster fishery would violate both federal and state fishery management laws. Federal gear marking requirements for the American lobster fishery include Universal Trap/Pot Requirements on the buoy, including vessel registration number and/or US vessel documentation number, federal commercial fishing permit number or positive identification as required by the vessel's home-port state. Lobster trawls

of three or fewer traps fished in federal waters must be attached to and marked with a single buoy; lobster trap trawls of more than three traps must be marked with a radar reflector and a single flag or pennant on the westernmost end and radar reflector only on the easternmost end. Individual states also have gear marking requirements.[9] For example, Maine law states that "[a] person may not fish for or take lobster by any method other than conventional lobster traps…"[10] and requires that "[a] lobster or crab trap or trawl must be marked by a lobster buoy as described in subsections 3 and 4. The buoy must be visible at the surface."[11] In Massachusetts, state regulations require a single buoy with a flag to mark the north (or west) end of the trawl and a double buoy on the south (or east) end. The double buoy can be two buoys tied together or can be two buoys on a 3- to 4-foot-long stick.

37. Based on my professional experience and for the reasons stated above, it is my opinion and belief that there does not currently exist a pop-up buoy gear system that could be practicably implemented for use today in the Dungeness crab fishery or the American lobster fishery. Further, it is my opinion and belief that there are significant legal, operational, safety, and economic challenges that would be necessary to address, likely requiring years of research, testing, and communication with commercial fisheries stakeholders as well as changes to one or more states' laws before pop-up buoy gear could become feasible for widespread use in any American fixed gear fishery including Dungeness crab or American lobster fisheries.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed this 18th day of June, 2020, at Brunswick, Maine.

/s/
Noah Oppenheim

[9] https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/March%202018%20Ropeless%20subgroup/ropeless_subgroup_lobster_gear.pdf
[10] MRSA, Title 12, §6432(1)
[11] MRSA, Title 12, §6432(2)

Addendum G

Atlantic States Marine Fisheries Commission

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James J. Gilmore, Jr. (NY), Chair *Patrick C. Keliher (ME), Vice-Chair* *Robert E. Beal, Executive Director*

Vision: Sustainably Managing Atlantic Coastal Fisheries

June 19, 2018

Michael Pentony
Regional Administrator
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear ~~Mr. Pentony~~ Mike,

The Atlantic States Marine Fisheries Commission (Commission) is concerned about the status of the North Atlantic right whale population and is committed to identifying solutions that support the recovery of this endangered species.

Among the measures under consideration as a means of reducing impacts on right whales are ropeless fishing technologies. The Commission tasked its Law Enforcement Committee (LEC), composed of marine fisheries enforcement officers from the states and federal agencies, to review the enforceability of ropeless fishing technologies in the American lobster fishery. This letter provides an overview of the Commission's review of the LEC report to the Board and the issues identified based upon our review. These issues are being communicated in order to aid in the development of technologies which improve the status of the right whale population while maintaining valuable Atlantic coast fisheries.

The LEC considered several types of ropeless fishing technologies including those employing spools, lift bags, and bagged line to enable the retrieval of traps from the ocean floor. Its review identified significant concerns about the impact of ropeless fishing technology on the enforceability of rules governing lobster fishing. Many management measures used to ensure a sustainable lobster resource, including trap tag allocations and vent sizes, are verified through frequent retrieval of fishing gear by law enforcement. Given the significant costs associated with the new technology at this point and the additional time needed to return inspected gear to the ocean floor, either by deploying a new spooled rope, re-bagging line, or replacing air canisters, the adoption of ropeless technology would likely result in a diminished ability to inspect gear. These restrictions in budget and enforcement time would likely result in fewer lobster traps inspected, thereby reducing incentives for compliance in the lobster fishery. Non-compliance is a particular concern given the rapid increase in the fishery's value over the last decade. Moreover, a reduced ability to enforce regulations would be detrimental to the sustainability of the lobster fishery

Based upon its consideration of the LEC's report on ropeless technologies, the Commission also expressed concern regarding the potential for multiple ropeless fishing technologies to be adopted in the lobster fishery. It was noted that if multiple technologies are approved for use along the

Atlantic coast, enforcement vessels will need the capability to retrieve lobster gear with all of the approved technologies. This would represent not only a financial burden on enforcement agencies but also a logistical challenge given many of the technologies require additional deck space to store rope and/or spools. If enforcement vessels do not have the ability or space to haul all types of ropeless gear, such limitations would further increase concerns regarding diminished gear inspection capacity and increased non-compliance in the fishery.

The Commission had several questions regarding the storage and security of trap location information. Specific questions included: Who will be in charge of storing information on individual trap locations? How will this data be protected? There were also questions about the potential ability of persons to 'steal' acoustic and radio frequencies and retrieve lobster traps which belong to other harvesters. The LEC noted the security of location and frequency information should be a priority moving forward. The LEC also questioned the ability to conduct covert operations with ropeless fishing gear given that, in the case of some of the technologies, fishermen are immediately notified when their gear reaches the surface.

Finally, the Commission notes the adoption of ropeless fishing involves all vessels, not just those that participate in the lobster fishery. Since the removal of surface systems would eliminate the visual signal of where traps are located, all vessels, including those who participate in mobile gear fisheries, would need to have an acoustic modem in order to locate submerged traps and minimize gear conflicts. Given the large numbers of vessels that would be impacted by the adoption of ropeless fishing, the Commission requests that a comprehensive cost analysis is conducted if NOAA takes the next step to consider any of the devices as a gear requirement. The Commission would stress the importance of fully vetting and testing these devices to ensure the ability to track and locate traps if the technology fails. It would be detrimental the lobster and other fisheries resources if an increase volume of "ghost" gear were caused by this new technology.

While we have raised concerns regarding the enforceability of ropeless fishing, the Commission fully recognizes that, in the past, many technological improvements have greatly improved the ability to enforce fishery management measures. As a result, the Commission supports the continued development of all technologies which may improve the status of Atlantic right whales and allow for the continuation of Atlantic coast fisheries. The decline of right whale populations since 2010 is a serious concern to the Commission and the need to develop effective solutions is of utmost importance.

We invite NOAA Fisheries to draw upon the experience and expertise of the ASMFC and its member states as we continue to collaborate on these important issues. If you have any questions or comments, please do not hesitate to reach out.

Sincerely,

Robert E. Beal

L18-054

cc: American Lobster and ISFMP Policy Boards