Atlantic Large Whale Take Reduction Team Meeting
October 9 – 12, 2018
Omni Hotel, 1 West Exchange St, Providence, Rhode Island
Key Outcomes Memorandum – November 26, 2018

I. WELCOME, INTRODUCTIONS AND MEETING OBJECTIVES

NOAA's National Marine Fisheries Service (NMFS) convened a meeting of the Atlantic Large Whale Take Reduction Team (ALWTRT, TRT or Team) from October 9-12, 2018 in Providence, Rhode Island. The goal of the meeting was to develop and discuss needed modifications to the Atlantic Large Whale Take Reduction Plan (ALWTRP, TRP or Plan) to further reduce impacts of U.S. fixed gear fisheries on large whales and reduce mortality and serious injury (M/SI) to below Potential Biological Removal (PBR) for right whales. In preparation for this meeting, several TRT members developed proposals outlining a set of potential TRP modifications to be used as a basis for discussion at this meeting. In particular, the objective was to elicit recommendations on measures that merit further evaluation by the agency, for further refinement and consensus decision-making at the March 2019 ALWTRT meeting. The meeting was facilitated by Scott McCreary (CONCUR) and Bennett Brooks (Consensus Building Institute). Additional work group facilitation on Day Three was provided by Jonathan Raab (Raab Associates) and Meredith Cowart (CONCUR).

The meeting began with a series of welcomes and meeting overviews. Sam Rauch, NOAA Fisheries Deputy Assistant Administrator, and Mike Pentony, Regional Administrator for NOAA Fisheries Greater Atlantic Regional Fisheries office, each offered welcoming remarks, emphasizing both the need for substantial measures to address right whale mortality and serious injury and the value of collaborative approaches to find workable solutions. S. McCreary reviewed the agenda, and B. Brooks provided an overview of meeting protocols.

II. PARTICIPATION

The three-day meeting was attended by 44 members of the 59-person team. Participating Team members (or their alternates) were:

Terry Alexander, Sara Blachman, Dave Borden, Peter Brodeur, Dwight Carver, Elizabeth Casoni, Jane Davenport McClintock, Gregory Didomenico, Cindy Driscoll, Bob Glenn, Caroline Good, Earl "Sonny" Gwin, Dennis Heinemann, Dancy Kiley, Raymond King, Scott Kraus, Scott Landry, Kristy Long, Lori Caron, Robert Martin, Charles Mayo, Patrice McCarron, Kristen Monsell, Grant Moore, Robert Nudd, Scott Olszewski, Cheri Patterson, Charlie Phillips, Thomas Pitchford, Kristan Porter, Michael Sargent, Arthur Sawyer, Brian Sharp (represented by Dr. Michael Moore on Day Four), Erin Summers, Todd Sutton, William Swingle, Megan Ware, Colleen Weiler, Mason Weinrich, Dave Wiley, John Williams, Sharon Young and Barb Zoodsma.

Alternates representing TRT members on the last day include Michael Moore and Amy Knowlton.

Colleen Coogan (Atlantic Large Whale Take Reduction Team Coordinator for the NMFS Greater Atlantic Region or GAR) and Mike Asaro (GAR Marine Mammal and Sea Turtle Team Lead), along with Sean Hayes (NMFS Northeast Fisheries Science Center Protected Species Branch Chief) provided support for the Team. Other NOAA staff attending all or part of the meeting included: John Almeida, Ingrid Biedron, Diane Borggaard, Peter Burns, Tim Cole, John Higgins, Charles Lynch, David Morin, Allison Murphy, Mark Murray-Brown, Richard Pace, Danielle Palmer, Jessica Powell, Allison Rosner, Ainsley Smith, Jaclyn Taylor, Nick Sisson, Eric Thunberg, and Jeff Ray.

Other NMFS leadership attending the meeting in addition to S. Rauch and M. Pentony included Donna Wieting, Director of the Office of Protected Resources, Shannon Bettridge, Chief, Marine Mammal and Sea Turtle Conservation Division, Office of Protected Resources, and Susan Gardener, Deputy Northeast Fisheries Science Center coordinator.

Katie Moore with the U.S. Coast Guard and Randy Jenkins from Fisheries and Oceans Canada (DFO) were other governmental representatives that attended and presented at the meeting. Approximately 40 members of the public, state agencies and affiliated organizations were in attendance over the course of the meeting.

III. MEETING MATERIALS

A number of materials to support deliberations were provided in advance, including the seven proposals by Team members to modify the Plan to reduce M/SI from entanglement of right whales. Meeting materials can be found at the following link: https://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/trt/meetings/October%202018/27_october_2018_full_trt_meeting.html

IV. PRESENTATIONS

Day One Presentations:

Overview of Right Whale Problem Statement

Review of North Atlantic right whale recovery challenges: Susan Gardner and Sean Hayes. S. Gardner, Northeast Fisheries Science Center (NEFSC or Science Center) Deputy Science and Research Director, introduced the session, emphasizing the complexity of the issue and underscoring the Center's focus on providing best available information to the Team (as opposed to prescriptive management measures). S. Hayes with the Science Center then presented an overview of NOAA Technical Memorandum NMFS-NE247, *North Atlantic Right Whales—Evaluating Their Recovery Challenges in 2018* ("Technical Memo" or "Memo"), an overview provided to the Team in advance of the meeting. S. Hayes emphasized that the apparent decline in right whales over the past

six years or so (from 481 whales in 2010 to an estimate of just over 400 whales as of 2018) is driven by three core factors:

(1) Ecosystem shifts appear to be impacting right whales' core food supply, causing whales to spend less time in traditional habitats and more time and energy to travel greater distances to forage for food;
(2) The greater distances traveled appears to be increasing whales encounter rates with shipping and new fisheries (now seasonally regulated to reduce marine mammal bycatch in some areas, prior to 2017 unregulated for this purpose); and
(3) The behavior of fisheries in historical whale habitat use areas has changed, potentially increasing interaction rates or severity of interactions with whales.

These shifts appear to be resulting in both mortalities and health-related effects (e.g., reduced calving). S. Hayes also clarified a comment in the Tech Memo that stated that rope strength has increased in recent years due to previous Take Reduction Plan modifications such as the trawling up provision; he noted the paper should have presented that specific assertion as a hypothesis. Bob Kenney presented a supporting analysis that also suggested that entanglement in fisheries is a likely limiting factor restricting the right whale population. Based on his modeling work, Kenney's paper (currently in press) suggests that - in the absence of documented serious injuries or mortalities caused by entanglements - the current right whale abundance would be expected to be more than 580 whales.

In addition to numerous clarifying questions, the presentations triggered significant discussion.

- Several conservationist/environmentalist and scientist comments centered on the imperative to take action given the Science Center's analysis. They stressed, in particular, the importance of the Science Center's core message – urgent actions are needed to improve right whale survival given current trends in the ecosystem, whale behavior and fishery changes, and the apparent drop in right whale abundance – and they encouraged the Team to stay focused on potential actions the U.S. fisheries can take.

- Commercial fishery and several state representatives, while appreciative of the Center's clarification on rope strength, voiced significant concerns. These included concerns that the paper; (1) inappropriately singles out Maine lobster fishermen (as opposed to the Atlantic coastwide fixed gear fisheries); (2) relies on outdated and incomplete data (e.g., does not incorporate more recent ASMFC and state data on lobster fishery characterization) (3) is significantly harsher and more conclusive in tone than the presentation; and, (4) minimizes Canada's role in M/SI particularly given recent known information on Canadian ship strikes, known snow crab gear entanglements, and patterns of rope diameter recovered from entangled whales. They suggested the paper had the unintended consequence of straining trust and further complicating the Center's relationship with fixed gear fishermen as well as other stakeholders and state partners, and will make it increasingly difficult to enlist fishermen and others as active partners.

Based on their concerns, these Team members requested that the Science Center (1) update the technical memo to address the identified deficiencies; (2) review the draft with industry and the states to assess the extent to which the concerns have been addressed; and (3) communicate corrections or changes to stakeholders.

M. Asaro and S. Hayes said the Agency would consider Team feedback and potential updates to the tech memo.

U.S. Management and Enforcement Updates

Entanglement, M/SI Data: David Morin. D. Morin provided a summary of large whale entanglements, including M/SI data. His presentation highlighted the following key points:

(1) The latest large whale entanglement data (40 large whales total in 2018 thus far versus 43 in all of 2017; 5 right whales in 2018 to-date versus 9 in all of 2017);
(2) Recent 2017-18 data on origin of gear taken off whales (on right whales, a mix of Canadian snow crab trap/pot gear, unknown Canadian and 2 unknown; on other large whales, a mix of US and unknown gear);
(3) M/SI from documented entanglements in right whales has exceeded PBR every year but one since 2000; and
(4) An increase in the proportion of M/SI to non-serious injury determinations from 2013-2017 (both with and without gear).

In addition to a number of clarifying questions, Team members expressed interest in seeing better data on line diameter and the nature of entanglements so they can assess the extent to which the line is potentially used in U.S. fisheries. (Comprehensive data was provided later in the meeting and is available on the meeting website). They also sought to know the type of line found (D. Morin noted it is end lines). One Team member cautioned against presenting data that shows M/SI exceeding takes for gear first-sighted in the U.S. because the first sighting is not always indicative of the location of the entanglement.

Enforcement updates: Jeff Ray, Office of Law Enforcement, and Katie Moore, U.S. Coast Guard. J. Ray with the NOAA Fisheries Office of Law Enforcement and K. Moore with the U.S. Coast Guard provided several enforcement-related updates. Key presentation points by OLE included the following:

(1) Reviewing the funding and hours provided to support TRP and gear compliance;
(2) Providing data on contacts made by lobster management area and gear type;
(3) Summarizing compliance rates (92%, down from 97% the previous year) and violation types.

The Coast Guard's presentation centered on providing background on Coast Guard's role, its targeted TRP enforcement efforts by district, and a summary of enforcement actions.

Team members voiced continued concerns about Area 3 enforcement capacity and effort, lack of enforcement in closed areas and the importance of ongoing partnering with industry.

Recovery plan implementation: Diane Borgaard and Barb Zoodsma. D. Borgaard and B. Zoodsma, both with NOAA Fisheries, presented an overview of the Agency's right whale recovery planning efforts. Presentation points centered on the following:

(1) Reviewing Recovery Plan requirements based on the Endangered Species Act; and
(2) Summarizing implementation team structure (distinct Northeast and Southeast Implementation Teams that feed into an integrated U.S. North Atlantic Right Whale Implementation Team), objectives, participation and meeting schedule.

Team members recommended the Agency convene additional public forums on the topic to foster broad engagement, as well as continue dialogue regarding a coastwide approach to ship strikes.

Day Two Presentations

NMFS Field Monitoring and Research Updates

Northeast Fisheries Science Center aerial survey update: Tim Cole. T. Cole with the Northeast Fisheries Science Center provided an update on the Science Center's right whale aerial survey methods and findings. Aerial surveys use photographic capture of right whales to monitor the population and document injuries. The surveys also assist with disentanglement and carcass relocation, and they fly systematic surveys to chart regional whale distribution. In 2017-18, survey efforts focused on finding and returning to right whale aggregations to improve population monitoring efficiency, which included systematic coverage of different regions. Geographically, survey effort the past two summers focused on the Gulf of Saint Lawrence (the area with highest right whale sightings). The effort shifted to Canada after the spring and when few whales were being seen in US waters. NEFSC estimates that there were approximately 150 individuals in the Gulf of St Lawrence in 2018. The Science Center hypothesizes that the remaining animals in the stock (approximately 300 individuals) are either in aggregations elsewhere or distributed along the eastern seaboard.

One Team member expressed concern that NOAA funding is being used to support research efforts in Canada and asked whether funding will be redirected back to US survey efforts now that Canada has become more engaged. T. Cole stated that immediate short-term efforts were needed to establish an understanding of the whale population in the Gulf of St. Lawrence, and that it was critical to help Canada build survey capacity of its own. In the next year, as the right whale population's distribution and habitat use in the Gulf of St. Lawrence is better understood, NOAA survey efforts will again be focusing effort in US waters in late summer. Another Team member suggested that using historical data sighting to overlay the statistical areas would be useful for industry. T. Cole noted that the Science Center would implement that request.

Southeast US Right Whale Aerial Survey Update: Clay George. C. George, Georgia Department of Natural Resources (GADNR), provided an overview of the Southeast US

Right Whale Aerial survey methodology and findings. Since 2001, the aerial teams have observed fewer calves (zero calves in 2018). C. George explored potential explanations for this reduction, including that the survey effort has been reduced, the whales are now calving in a new location, calving timing has shifted to earlier or later in the year, or shark depredation is higher. He noted that only one right whale calf was photographed with a shark bite injury and one would expect to see more evidence than that if shark depredation was occurring regularly. He noted that while it is not possible at this stage to rule out the possibility that location or timing of calving is changing, there is little evidence to support any of these hypotheses, and most likely fewer calves are being observed because fewer calves are being born.

Following the presentation, one fishing industry member encouraged the GADNR to look further into the impacts of shark depredation, as the shark population has rebounded. C. George noted that the best way to rule out depredation is to biopsy females to determine pregnancy, but that the shark depredation does not likely account for the degree of decline that has been observed. Another Team member suggested that in 2018, whales may have remained in the northeast to calve. C. George stated that while the 2018 survey effort was not able to address this directly, no calves were observed in Mid-Atlantic or northern waters. To try to capture right whales north of the calving survey area, this winter some survey effort, including some using passive acoustic gliders, will occur in the Mid-Atlantic and Northeast.

Another Team member asked whether information from acoustic surveys on whale distribution and location is being used to better understand whale distribution and calving patterns. C. George noted that passive acoustic monitoring has provided some of the most conclusive evidence on shifting distribution, but that these data are not reliable for better understanding calving patterns because mother/calf pairs appear to not vocalize when the calf is young.

Large whale unusual mortality event updates: Jaclyn Taylor. J. Taylor, NMFS Office of Protected Resources (OPR), presented updated findings regarding large whale Unusual Mortality Event (UME) events. Seven UMEs are actively under investigation, including three concurrent large whale UMEs: the 2016-18 Humpback Whale in the Atlantic (Cause: Undetermined; Contributory Human Interaction); 2017-2018 North Atlantic Right Whales in the Atlantic (Cause: Preliminary Human Interaction) and; 2017-2018 Minke Whales in the Atlantic (Cause: Undetermined; Contributory Human Interaction and Infection). She noted that each of these three concurrent large whale UMEs span from January 2016 to the present and from Atlantic Canada to Florida, involve 155 whales in total, and include preliminary or contributory findings of human interaction in all three investigations. There were no questions or comments following the presentation.

Canadian Research and Management Updates

2018 efforts and looking forward: Randy Jenkins. R. Jenkins, Canadian DFO, outlined the measures Canada has initiated in the Gulf of St. Lawrence to help mitigate human impacts on the North Atlantic Right Whale. Urgent measures (closed fisheries, increased surveillance, slowdown on large vessels) were put in place in 2017, and longer-term preventative measures were enacted in 2018.

Management measures enacted in 2018 include: entanglement prevention; increased monitoring and surveillance (including aerial surveillance, at-sea vessel monitoring; acoustic gliders and reports from fishing industry and partner organizations); and static and dynamic area closures. The DFO observed high levels of compliance with the management measures and a resulting strong reduction in mortalities and entanglements (12 mortalities and 5 entanglements in 2017 and zero mortalities and 3 entanglements in 2018). Looking forward, the Canadian government is now supporting innovation in fishing technologies such as ropeless gear, TAG lines, weak rope, etc. R. Jenkins emphasized that the DFO will continue to use a holistic approach to reduce right whale M/SI. Measures will include prevention (closures, speed restrictions), mitigation (gear innovation and gear modifications), response (increased disentanglement capacity) and monitoring (surveillance, gear marking and reporting requirements).

Team members asked several clarifying questions. Additional Team member comments emphasized several important next steps, including: maintaining closures; evaluating whether a "fencing effect" is occurring around closed areas; expanding survey efforts and regulations beyond the Gulf of St. Lawrence; and expanding gear marking beyond that initiated in snow crab fisheries. A Maine fisherman voiced frustration that he regularly observes unmarked excess floating surface line from Canadian fleets operating in "grey zone" fished by both US and Canadian fishermen. This is particularly frustrating in the grey zone, where US and Canadian fishermen fish side-by-side under two different sets of rules. He stated that Canadian gear needs to be more strictly regulated, consistently with US gear, to reduce interactions and allow for better understanding of where and why interactions are occurring.

Recent Fishery Gear Research

Gulf of Maine: Vertical Line Characterization: Erin Summers. E. Summers presented preliminary findings from a vertical line characterization study conducted from Maine to Connecticut to assess the breaking strength of vertical lines currently used, determine line strength needed to fish safely and efficiently, identify critical variables in explaining those data, and potentially assess proposed management measures. Methods include polling, collecting vertical line samples (rope diameters of 5/16, 11/32, 3/8 and 7/16), and breaking samples (clear, splice and knot). Average breaking strength ranged from about 600 pounds of force (LBF) (5/16 with knot) to about 2,000 LBF (7/16 clear).

Team member comments focused primarily on clarifying questions. One Team member recommended that any broken ropes be sent to an independent lab for analysis. He also suggested that at future presentations, it will be important to present results by rope type.

Massachusetts Lobstermen Association's summer 2018 and future ropeless research: David Casoni. D. Casoni reviewed activities within the Massachusetts lobster fishery generally, and the MLA specifically, to reduce right whale interactions. He noted that the number of Massachusetts coastal lobster permits has declined each year since 2000, and he highlighted conservation efforts undertaken, including gear restrictions, gear marking, and closures. The bulk of his presentation centered on describing a research effort underway in the Massachusetts lobster fishery, in cooperation with the International Fund

for Animal Welfare, to test "buoyless" (ropeless) fishing gear and methods. His presentation underscored the numerous challenges that currently undermine the potential to use ropeless fishing. These challenges include depth, deployment, cost, customization required, and unintended consequences (e.g., device triggering on its own). The presentation included a video showing the gear modification in use on his lobster vessel.

Several Team members complimented D. Casoni on his willingness to test emerging technologies. At the same time, Team member comments highlighted the many remaining obstacles (workable technology, safety considerations, gear conflicts, reliability, etc.) that stand between the promise and adoption of ropeless fishing. One Team member noted the importance of not confusing technologies that are fairly well known (triggering a buoy to the surface) with those that still defy solution (alerting other vessels and gear types to the presence of ropeless gear). One Team member voiced frustration that so little progress has been made over the past two decades, and he encouraged all parties to redouble efforts to test and improve the technology.

Right whale entanglement and scarring data: Amy Knowlton. A. Knowlton provided the New England Aquarium's review of 2010 - 2018 right whale entanglement and scarring data, and how these data can help inform management efforts. In the 2010 – 2018 period, at least 412 entanglements occurred, most of which cannot be linked to a region or country. Entanglements impacts remain high. This year Canada is playing a significant role in reducing entanglement mortality, but entanglements are still occurring. Entanglement severity also remains high, with nearly 50% of 2016 cases showing moderate to severe injuries. Severe injuries are observed in stronger rope and heavier gear. She noted that management actions to address these issues need to be broad-based and center on both the US and Canada.

A. Knowlton also provided a review of the results of NEAq and the Anderson Center for Ocean Life's development and study of whale release ropes, conducted in partnership with the South Shore Lobster Fishermen's Association and the Mass Lobstermen's Association. Multiple rope materials and designs were developed and tested in an attempt to target 1700 lb breaking strength rope. Studies determined that multiple design options for producing 1700 lb breaking strength rope are available, and that 1700 lb sleeved ropes are generally working operationally for fishermen where tested. She noted that most loads measured by at-sea testing are well below 1700 lbs in water of 450 feet or less, and that operational or gear changes, such as installing a groundline extension can reduce tension on an endline.

Team members posed a number of clarifying questions. Additionally, comments centered on the following topics: (1) the need to better understand line degradation both over time and in real fishing conditions and the likely impact to line breaking strength; and, (2) noting that the 26% annual entanglement rate is almost certainly a minimum rate given that numerous animals are likely dying at depth and never reported or documented. One Team member noted industry interest in testing weak sleeves in Maine, but thus far, the results have not been promising. There is, however, interest in testing weak sleeves on larger (7/16-inch) line in Maine if sleeves of that dimension become available.

Update on NEFSC planned gear research and additional work being done: weak rope development, ropeless fishing efforts: Eric Matzen, NEFSC. E. Matzen provided a brief

update on NEFSC gear research accomplishments and goals. The NEFSC is looking to collaborate with several commercial fishing vessels to evaluate ropeless technologies that minimize the potential for marine mammal interactions in pot and trap fisheries, during different times of the year and in different areas. There was only brief discussion following the presentation.

Outcome of Feasibility Subgroup Efforts

Summarize feasibility subgroups' efforts: Colleen Coogan. C. Coogan, NOAA GARFO, provided a summary of outcomes from the (a) whale release and gear marking subgroup and (b) ropeless fishing feasibility subgroup held earlier this year. The first group discussed four options in breakout groups: (1) tagline to extended groundline; (2) south shore weak sleeve; (3) 1700 lb breaking line strength; and (4) 3/8th inch diameter line. Options 2-3 were determined to be operationally feasible under some conditions, though there were concerns about feasibility in untested areas such as deep-water fisheries and about costly changes across the industry.

The first group also identified three gear marking modification options for discussion: (1) geographic changes; (2) increased frequency and placement on either surface system or vertical line; and (3) use of new technology (PIT tags, chips). The group generally supported expanding gear marking used to further illustrate where gear is and is not involved in entanglements, recommended that the precise problem statement be precisely identified and identified cost/time concerns.

The ropeless feasibility subgroup defined ropeless fishing, identified feasibility concerns and identified best practice considerations for ropeless research. The group generally supported the concept that fishermen be involved in further research on operational feasibility for ropeless fishing as an alternative to closures.

C. Coogan noted that key outcomes memoranda for each subgroup can be found on the ALWTRT website.

Key Questions or Comments Following the Presentation:

- There were no questions or comments following the presentation

Review of Advance Notice of Proposed Rulemaking: Mike Asaro. M. Asaro (NOAA GARFO) provided a review of and sought Team member comments on the Agency's advance notice of proposed rulemaking (ANPR) related to fishing without vertical buoy lines. Per the ANPR, the Agency is investigating the potential to modify existing TRP trap/pot management regulations in two closed areas - the Massachusetts Restricted Area and Great South Channel - by changing the requirement from no active fishing to no active fishing *without* buoy-lineless trap/pot gear. Allowing ropeless fishing in closed areas was identified by Team members as a way to incentivize research and development of ropeless fishing gear. Since fishing without surface systems would still require an exemption from other federal and state fishing regulations, exempted fishing permits (EFPs) would be required. EFPs, which require research plans, can be highly conditional and would be issued annually. M. Asaro asked that a cross-interest working group

develop EFP conditions, which would form the basis of a proposed and final rulemaking. NMFS would report back to the Team annually on the outcomes of the research.

The draft language triggered extensive discussion. Some Team members stressed the imperative to move forward with ropeless fishing experimentation (given the importance of eliminating interactions as a strategy to reduce right whale M/SI and the need for near-term solutions). There were also suggestions that financial incentives be provided to encourage fishermen to participate. And while these Team members acknowledged the need to develop a thoughtful set of conditions to an EFP before any experimentation is done, they encouraged the Agency to move forward with a proposed rule and supported the concept of a best practices working group.

Other Team members voiced concerns with the ANPR, with their comments centering on the following:

- Concern that opening area closures to ropeless fishing has a significant potential of creating gear conflicts between lobster and mobile gear fisheries. Rather than risk gear conflicts, these participants said, it may be preferable for the region to focus lineless/buoyless fishing on those areas where conflict with mobile gear fisheries is unlikely. Potential candidate areas to serve as testing grounds included a portion of Stellwagen Bank, state waters closed to trawling along western Cape Cod Bay (given hard bottom conditions) and the Gulf of Maine groundfish closure area.

- Concern that best practices and EFP conditions need to be carefully worked through before access could be provided to either closed area. One participant stated that the TRT's 2009 recommendation (and the best practices outlined there) needs improvement and should not be applied verbatim. He noted that the EFP conditions must dictate parameters for experimental design that make this research meaningful to the Team 3-5 years from now. For example, the design should not favor a specific engineer or technology, should ensure adequate time for a robust sample size, and should move towards underwater detection of gear location. Another concern was that the difficulty of enforcement could lead to loopholes in implementation of the lobster regulations.

- Not allowing ropeless fishing in Cape Cod Bay until the techniques are well-tested and proven to work. The stated concern is that Cape Cod Bay is an area of high concentration of animals and using untested gear in this area could have detrimental consequences. However, one member stated that fishermen in this area deserve a reward for the concessions they have made, so should not have to wait too long.

- Concern was expressed that the ANPR could have unintended consequences if the intention was to change the definition of "closed area" writ large to ropeless areas for all current and future restricted areas.

M. Asaro suggested that the various concerns raised in the discussion would be exactly the types of issues that could be anticipated and accounted for as part of the EFP process. He reiterated the value of a working group to flesh out possible conditions, and he noted that any EFP proposal would be brought to the Team for review and concurrence.

Nearly twenty members offered to serve on a Ropeless Fishing Best Practices Work Group to help define the conditions that would be important to impose on any EFP permit issued (if the agency were to pursue the proposed regulation). These members included S. Landry, S. Kraus, C. Mayo, S. Young, C. Good, M. Weinrich, K. Monsell, J. Davenport, B. Sharp, T. Alexander, B. Glenn, E. Casoni, A. Knowlton, C. Patterson, M. Ware, R. Nudd, L. Caron and E. Summers. Others were potentially interested in participating, but were not prepared to volunteer at this time.

Given Team member questions, comments and concerns, and after subsequent consideration, M. Asaro recommended on Friday that consideration of the proposed rule be deferred for the remainder of the October meeting.

V. PROPOSAL PRESENTATIONS

As noted in Section I above, in preparation for this meeting and at the request of the Agency, several TRT members submitted proposals outlining a set of potential TRP modifications to reduce large whale M/SI. These proposals were meant to serve as the basis for discussion and recommendation by the full Team on a set of potential measures that merit further evaluation by the agency, for further refinement and consensus decision-making at the March 2019 ALWTRT meeting. Seven proposals were developed in preparation for the meeting. In the afternoon of Day Two, one of the authors of each proposal presented the proposal to the group, including the measures recommended and rationale. Two additional proposals were developed during the meeting and presented on the morning of Day Three (Thursday) prior to work group discussion of the proposals. One of these has since been fleshed out and posted with all proposals to the ALWTRT website, at the following link: https://www.greateratlantic.fisheries.noaa.gov/protected/whaletrp/trt/meetings/October%202018/27_october_2018_full_trt_meeting.html

Below is a listing of the proponents for each of the 8 proposals presented and discussed, as well as a ninth proposal submitted after the meeting.:

- Proposal 1: Regina Asmutis-Silvia and Colleen Weiler, Whale and Dolphin Conservation
- Proposal 2: Erin Summers, Maine Department of Marine Resources
- Proposal 3: Daniel McKiernan (on behalf of David Pierce), Massachusetts Division of Marine Fisheries
- Proposal 4: Sharon Young, the Humane Society of the United States; Jane Davenport, Defenders of Wildlife; Kristen Monsell and Sarah Uhlemann, Center for Biological Diversity
- Proposal 5: Scott Kraus, Amy Knowlton, and Tim Werner Anderson, Cabot Center for Ocean Life at the New England Aquarium
- Proposal 6: John Haviland, South Shore Lobster Fishermen's Association

- Proposal 7: J. Grant Moore, Broadbill Fishing Inc & F/V Direction and Peter Brown, Brown Fishing Co. & F/V Rachel Leah
- Proposal 8: Caroline Goode
- Proposal 9: Dave Borden and the Offshore Lobstermen's Association

In preparation for the meeting, NMFS conveners developed a Table of Proposal Elements, updated to include late submissions, (see Appendix A: Table of Proposal Elements) that summarized the distinct elements of each proposal (e.g. rope diameter recommendations, Vessel Trip Report recommendations, area closure recommendations, etc.), in order to allow direct comparison and discussion across proposals.

VI. PROPOSAL ELEMENTS WORK GROUP DISCUSSIONS

On the morning of Day Three, Team members broke into four facilitated cross-caucus work groups to review a subset of elements of each proposal, discuss ability/potential of each element to further reduce impacts of U.S. fixed gear fisheries on large whales and reduce mortality and serious injury (M/SI) to below Potential Biological Removal (PBR) for right whales, and gauge the extent to which participants support further evaluation of each element.

The primary purpose of the work groups was to foster more in-depth conversations on the various proposals. Each group took straw polls throughout the session to identify and gauge support for those elements that merit further analysis by NMFS, and recommended potential improvements or additional measures that would strengthen the support for further analysis by NMFS. Particularly noteworthy results (e.g., areas of broad agreement) are noted below, but – for the most part – the poll results are not summarized in this report as the groups' configurations (uneven numbers of participants from each caucus) limit the value of numeric results.

Most regulatory options, with the notable exception of further regulation of potential future aquaculture operations, received mixed support for further analysis, although Team members in some breakout groups were inclined to support further analysis if various preconditions were addressed, or if research were to be framed in a particular way.

Though the facilitators emphasized that the intent of the breakout group deliberation was to consider whether to advance some options for further analysis, much of the initial conversation focused on the merits of the measures rather that the merits of future analysis. This was especially true for measures involving closures, and in some cases, for weak rope.

Following the work group discussion, each group reported out key discussion points and observations. The report-outs and subsequent discussion highlighted the following cross-cutting themes:

- ***Broad support for deliberation format of cross-caucus breakout groups.*** Participants in all four breakout groups voiced strong support for cross-caucus breakout groups, suggesting that the structure fosters more in-depth and

productive discussions among a smaller group of Team members. Participants saw this type of discussion structure as a more effective way to understand each other's perspectives and potentially find more collaborative strategies.

- ***Some program elements with broad support for further analysis.*** There were a handful of proposal elements within the four groups that garnered broad support for further analysis in advance of the March 2019 meeting. Each element that received consensus support in at least one group is listed below, along with the response from other work groups that also polled on this issue (not all groups polled on all issues). The elements receiving consensus support in at least one work group include:

  - ***Implement robust area and fisher-specific line marking – Proposal 1*** (consensus support in two groups)

  - ***Require VTR on all vertical line fisheries – Proposals 1 and 4*** (consensus support in two groups)

  - ***Formalize MA's dynamic area closure – Proposal 3*** (consensus support in one group, strong support in three others).

  - ***Disallow aquaculture in any closed areas in any time of year – Proposal 4*** (consensus support in one group, strong support in one other)

  - ***Oppose any experimentation with grappling for gear – Proposal 1*** (consensus support in one group, strong support in one other)

  - ***Require VMS on all vertical line fisheries – Proposal 1*** (consensus support in one group, assuming AFSMC collaboration; mixed support in second group)

  - ***Disallow ropeless fishing via EFP in Cape Cod Bay – Proposal 1*** (consensus support in one group)

  - ***Allow ropeless fishing via EFP in proposed MV/ACK (per HSUS/DoW/CBD proposal) –Proposal 4*** (consensus support in one group; mixed support in a second group)

- ***Numerous options fell short of broad support for further analysis but discussions generated productive ideas for informing the next round of deliberations.*** Not surprisingly, many of the more contentious proposals - closures, breaking strength, rope diameter, vertical line reductions, etc. - received mixed support for further analysis. However, the level of support did vary among the different elements and in many instances, research ideas and/or preconditions were suggested that have the potential of bolstering support. Below is a synopsis of some of the key discussion points.

- ***Vertical line reduction.*** Support for further analysis of vertical line reductions varied significantly depending on the proposed approach. In general, there was broad agreement on the need to remove line from the water, and discussions suggested strong cross-interest support for further analysis of Maine's proposal to reduce line in surface systems. Alternatively, elements that incorporated a short time period for transitioning to ropeless fishing or suggested caps met with decidedly mixed support. Among those who voiced strong concerns, some suggested that the incorporation of longer transition periods and financial incentives could potentially make ropeless fishing a more viable alternative for analysis in some locations. Others remained skeptical that ropeless fishing will be a viable alternative in certain areas given bottom conditions and technological barriers. Effort reduction and trap caps were identified as already underway in some lobster management areas but actual effect on number of lines was difficult to determine. Additionally, there was very broad support to limit the use of any vertical line in new emerging fisheries (in particular aquaculture).

- ***Dynamic closures.*** There was broad though not universal support for further analysis of the Massachusetts proposal to formalize its current dynamic closure. However, support for further analysis of the broader use of dynamic management elsewhere met greater resistance, as a number of Team members expressed concerns regarding the significant implementation challenges associated with dynamic management (e.g., lack of predictability, challenges in pulling gear, enforcement). In general, Team members suggested it is easier to adjust/extend closures on the back end, delaying an area opening, and tougher at the outset when fishermen would need to retrieve gear on short notice.

- ***New closed areas.*** Discussions suggested wide-ranging reactions to the merits of further analysis of new closed areas put forward in several proposals. Some proposed closures met with great resistance (some see closures as a fail-safe measure only), although breakout group discussions did generate some individual suggestions for alternatives meriting further analysis. These included focusing analyses on the northern portion only of the proposed HSUS, et. al. MV/ACK seasonal closure area; trimming Box D in the New England Aquarium proposal (similar to HSUS), and conducting analyses on the distinct pieces in the NEAQ proposal. There were also suggestions to develop criteria to guide consideration of future closures. It was also noted that state regulators often can be more nimble when it comes to implementing and revising closures, further supporting dynamic management within state waters. As noted earlier, there was broad support to limit the use of any vertical line in new emerging fisheries (in particular aquaculture).

- ***Rope diameter/breaking strength.*** There is generally strong (but not universal) interest in seeing the Agency analyze a range of options related to rope diameter and breaking strength. For example, there was seemingly strong support in some breakout groups for the analysis of line that is weaker at the upper 2/3 but stronger at the lower 1/3 to withstand abrasion (though some emphasized the challenge of smoothly splicing the two lines together). Some Team members supported moving forward with analysis on 1700 lb breaking strength, while others felt that more research on 1700 lb breaking strength is needed. Other important nuances discussed included: (1) better understanding the conservation benefit to younger, smaller whales associated with 3/8 line or 1700 lb breaking strength; (2) analyzing the potential to use different rope configurations by region and/or bottom type; and (3) considering the merits of phasing in any change in rope to minimize costs to fishermen.

Other ideas that emerged from the cross-caucus breakout groups are summarized below.

- ***Refined gear marking.*** As noted above, required gear marking received very broad or consensus support in the two breakout groups that addressed this issue, as it provides valuable information about entanglements. In at least one group, there was also strong support for better understanding the benefits - to both whales and slowing line degradation - in painting the entire line red.

- ***Vessel Trip Reporting.*** Breakout group members expressed strong general support for improving reporting in all vertical line fisheries. Some made a recommendation to analyze the strategy for implementing eVTR as quickly as possible and make sure data elements are refined to address the concerns of the ALWTRP.

- ***Vessel Monitoring System.*** Similarly, while greater adoption of VMS was deemed worthy of investigation by some breakout groups overall and received strong support from scientists/NGOs, some small boat fishermen expressed doubt about whether VMS is applicable on smaller boats. ASMFC was identified as likely partner since they are already in discussions on vessel monitoring.

- ***Effort reduction.*** One participant noted that results from effort reduction studies are needed to show that measures taken to-date have been effective: "There's been quite a bit of trap reduction already, we need more data to tell us if this will really help." Some Team members are unsure whether effort reduction lies outside the scope of TRTs, or at least requires significant engagement by Fisheries Management Council. There is also some concern regarding how effort reduction currently driven by trap reductions translates into the kind of effort reduction that would be beneficial to whales - measured by number of lines and number of days lines are fished when whales are in the area.

- ***Support for a strategy to arrive at a small number of modifications that can be broadly applied***. Fishermen noted that identifying one solution that applies broadly (e.g. gear marking, weak link, breaking strength, etc.) would be more effective and less burdensome in terms of both implementation and enforcement. At the same time, fishermen cautioned against applying a "one size fits all" approach as variable conditions (geography, bottom conditions, fishing type, fishing methods) can impact the viability of any solution.

VII. WORK PLAN WORK GROUP FINDINGS

Following the Proposal Element Work Group report-outs and discussion of cross-cutting themes, Team members discussed the pros and cons of a) further distillation of elements that merit further analysis (a "Work Plan") by the conveners and facilitators or b) additional cross-interest Work Groups to propose an agency Work Plan. These straw man Work Plans would be presented back to the group on Friday (Day Four) for further review and winnowing by the full group.

Several members noted the need for additional agency guidance regarding items that merit further consideration. Conveners and facilitators, however, stressed the need for cross-interest work groups to develop recommendations, so as to guide the agency in further analyzing those options that are more likely to garner widespread support.

Following the afternoon plenary discussion and debrief, several members agreed to participate in Work Groups, and self-organized into three cross-interest groups:

- Work Plan Work Group 1: M. Ware, C. Good, S. Kraus, M. Swingle, M. Weinrich, K. Monsell, B. Casoni, D. Heineman, K. Porter, R. Martin
- Work Plan Work Group 2: B. Nudd, S. Olszewski, P. Brodeur, J. Davenport, A. Knowlton, L. Caron, C. Weiler, C. Mayo, C. Patterson
- Work Plan Work Group 3, E. Summers, B. Glenn, P. McCarron, S. Young, D. Carver

On the morning of Day Four, a representative from each Work Plan Work Group presented the key elements of his or her group's proposal (see Appendices C-E for full text of each Work Plan Proposal).

In discussion prior to these presentations, participants noted the need for a clear and agreed-upon definition of risk. S. Hayes provided the following definition: Risk = Likelihood x Severity, where likelihood might include the number or density of lines or encounter rate, and severity might include M/SI or sublethal impacts. He noted that quantification of risk can be difficult, but that models are being developed to compare the risk reduction benefits of various management actions. Ranking the relative risk of multiple options can also provide useful analysis (e.g. risk from highest to lowest: 1. traditional rope 2. 'weak rope' 3. 'ropeless'). Finally, S. Hayes noted that removing uncertainty informs an analysis of level of risk, e.g. through gear marking and vessel trip reporting.

Work Plan Work Group 1 (Ware)- Key Elements:

- Hold working group with scientist, rope engineers, and fishermen to consider **reduced breaking strength**, **gear marking**, and **rope color**.
- Hold a working group that considers **vertical line reduction** options (trawling up, closures).
- Hold a working group to consider best practices on experimental **ropeless fishing**.
- Calculate a baseline number of **vertical lines** in the water (not from IEC Model)
- Compile total and latent effort to reduce right whale M/SI
- Assess: impact of **1700 lb breaking strength rope** on whale behavior/outcomes; risk reduction and socio-economic impacts of proposed area closures; effectiveness of 600lb breakaway
- **Work with Canada** to obtain information on Canada research and regulations. Invite more Canadians to participate in March 2019 meeting

Work Plan Work Group 2 (Patterson) – Key Elements:

- Assess **1700 lb breaking strength rope** (feasibility in deeper waters, manufacture, impacts on all life stages of whales) in working group and further study
- Evaluate existing and proposed **area closures**: benefit/cost analysis, risk analysis overlap with other fisheries, ability to implement dynamic closures, mechanism to shift with changing habitat use, ability to add conditions, feasibility of temporary/emergent closures, feasibility of surveillance to address DMA, etc.
- Identify closed areas where **ropeless fishing** experimentation can begin immediately, NMFS regulatory process should move ahead concurrently with experimentation. Analyze complexities of gear conflicts.
- Characterize current vertical line/surface system and need for such systems
- Assess feasibility of requiring all vertical line fisheries to conduct **VTR reporting** in the near term
- Characterize number are location of **traps removed** from water to date, and in future, and co-occurrence with whales
- Assess feasibility of more refined **gear marking** measures

Work Plan Work Group 3 (Summers) – Key Elements:

- Assess benefits of reduced vertical **line diameters**
- Investigate benefits of **red rope** (support for ban of **black rope**)
- Consider **line cutters** in offshore gear as a trade-off for weak rope
- Consider potential benefits of **trap reductions linked to vertical line reduction**
- Assess benefits of **vertical line reductions**/less rope in surface system
- Create work group to develop **area closure** criteria and assess proposed area closures.
- Assess **dynamic area closure** mechanisms
- Ban **aquaculture** from closed areas
- Explore a stepwise path to implement **ropeless fishing experimentation** in a) initially, area closures b) then into feeding areas of high aggregation 3) and finally into broader fisheries and areas.

- Assess market/production of **more refined gear marking** (frequency/spatial resolution)
- Acknowledgement that **VTR** is being tackled through other management processes. Recommend that ASMFC explore **VMS** requirement for federal trap/pot fisheries.
- Assess opportunities to increase **gear hauling** in Area 3
- **Work with Canada** to develop measures similar to the U.S.

Cross-cutting:

- Assess **1700 lb breaking strength rope** in working group and further study
- Move ahead with regulations, research and work group needed to advance **experimental ropeless fishing**.
- Consider potential benefits of **trap reductions linked to vertical line reduction**
- Assess benefits/costs/feasibility of **more refined gear marking**
- Assess benefits/costs/feasibility of banning certain rope colors (black)
- Assess feasibility of requiring all vertical line fisheries to conduct **VTR reporting** in the near term (possibly through other regulatory mechanisms)
- Assess **dynamic area closure** mechanisms and feasibility
- Evaluate existing and proposed **area closures**
- Ban **aquaculture** from closed areas

Following the presentations, M. Asaro noted the proposed work plans are responsive to the agency's request for guidance on potential measures meriting further evaluation. He stated that the agency will review the proposed work plans to build an integrated near-term work plan. Given the number of recommended work plan actions and the limited time before the March in-person meeting, M. Asaro said the Agency will look to prioritize its work by focusing, in particular, on those elements with the greatest potential to reduce M/SI relative to effort and cost. As needed, the Agency will convene a Team webinar to discuss and finalize the work plan. Finally, M. Asaro reiterated the charge for the upcoming March 2019 meeting: to discuss and put forward a set of consensus-recommended management measures to reduce the serious injury and mortality of right whales in US fixed gear fisheries for inclusion in the TRP.

A state representative suggested that, to ensure sufficient conservation benefits, NMFS should also prepare a biological and ecological analysis of a "best case for the whales" alternative for the Team's consideration in March.

VIII. PUBLIC COMMENT

At the close of each day, facilitators opened the floor for members of the public to provide additional comments. A total of six public comments were made during the course of the meeting. These comments centered on the following:

- One member of the public sent in a comment proposing regulations to eliminate by 2020 all SI/M of endangered and humpback whales by vertical buoy ropes and

gillnets under the Take Reduction Plan and asked that it be considered by the Team during the meeting. The comment was forwarded to the Team and will be linked.

- One participant noted that the question, "where are the other 300 right whales?", posed in the NEFSC (T. Cole) presentation on aerial surveys is central to the conversation the Team is having, and critical to address. He stated that opportunistic sighting programs could be used to increase the effectiveness of aerial survey efforts.

- A US Coast Guard representative stressed that simple and predictable solutions are important from an enforcement and compliance perspective. She emphasized that if ropeless fishing in area closures with EFPs are chosen, it would be ideal to encourage VMS/AIS comparisons in this research, as those technologies are helpful for enforcement. She added that the Coast Guard is generally supportive of VMS/AIS, and will give C. Coogan a document comparing the two.

- A commenter representing the New England Aquarium (NEAq) noted that the NEAq has funding to support R&D of whale release breaking strength (more information can be found on the bycatch.org website, or by contacting Tim Werner and Amy Knowlton), and will also be conducting ropeless fishing testing with offshore fishermen in the next few months. The commenter noted that a report on ropeless fishing can also be found on the bycatch.org website (mentioned by D. Wiley).

- A commenter encouraged members to support the Save the Right Whales Act (H.R.6060 and S.3038), which would provide 5-10 million dollars per year in federal funding towards a transition to ropeless gear.

- R. Jenkins with Canada's DFO emphasized that there is a lot more work ahead for both Canadians and Americans on this issue, and that the solutions will not be "one size fits all," but adapted to specific areas. He stated that Canada welcomes the opportunity to take part in working groups and would be happy to provide further information on any items needing additional clarity. He also clarified that Canada is not in the process of opening fisheries that were closed.

- One participant stressed that as deliberations continue, it is important for the Team to consider coordination with mobile gear fleets regarding surface gear markings.

IX. NEXT STEPS

- CONCUR to develop a Key Outcomes memorandum summarizing key discussions points, recommendations and next steps. A draft will be distributed to Team members for a "red flag" review to identify key errors and omissions.

- NMFS is to develop and distribute to the Team a draft integrated Work Plan based on the three Work Plan recommendations presented on Day Four. The Agency will share relevant work products with the Team at regular intervals between now and the March 2019 ALWTRT meeting.

- Interested Team members (scientists, rope engineers, fishermen) are to convene a Rope Working Group to meet over the next several months to investigate rope usage, characteristics and methods to reduce entanglements.

- NMFS is to consider the merits of webinars on the following candidate topics raised during the meeting: (1) soundscape issues, particularly potential impacts on right whales of offshore wind farm development (noise, EMF, etc.); and (2) coastwide shipstrike strategy.

- The following individuals offered to serve on a Ropeless Fishing Best Practices Work Group: S. Landry, S. Kraus, C. Mayo, S. Young, C. Good, M. Weinrich, K. Monsell, J. Davenport, B. Sharp, T. Alexander, B. Glenn, E. Casoni, A. Knowlton, C. Patterson, M. Ware, R. Nudd, L. Caron and E. Summers. Others were potentially interested in participating, but were not prepared to volunteer at this time.

- Any questions or comments regarding this discussion summary should be directed to S. McCreary (scott@concurinc.net), B. Brooks (bbrooks@cbi.org) or C. Coogan (colleen.coogan@noaa.gov).

APPENDIX A: TABLE OF PROPOSAL ELEMENTS

APPENDIX B: WORK GROUP 1 WORK PLAN RECOMMENDATIONS

APPENDIX C: WORK GROUP 2 WORK PLAN RECOMMENDATIONS

APPENDIX D: WORK GROUP 3 WORK PLAN RECOMMENDATIONS