# Atlantic Large Whale Take Reduction Team
# Ropeless Fishing Feasibility Subgroup

## March 15, 16, 2018
## Key Outcomes

## Overview

NOAA's National Marine Fisheries Service created two subgroups of the Atlantic Large Whale Take Reduction Team in 2018 to brainstorm the feasibility of (1) whale release rope and gear marking and (2) ropeless fishing in fixed gear fisheries. The subgroup's deliberations will inform the Atlantic Large Whale Take Reduction Team's efforts to produce a long-term framework for the further reduction of mortality and serious injury of large whales in US waters below their potential biological removal levels.

During a teleconference on February 26, 2018, the ropeless feasibility subgroup discussed and clarified the subgroup's Terms of Reference and identified information needed for this in-person meeting. Background materials and the in-person meeting Agenda reflected the discussion and Key Outcomes from the teleconference.

**Participants at March meeting:**

- Subgroup Participants: Cheri Patterson, Charlie Phillips, Bob Glenn, Brian Sharp, Patrice McCarron, John Haviland, Megan Ware, Scott Landry, Amy Knowlton, Erin Summers, Mike Lane, Grant Moore, Peter Brodeur, Terry Alexander, Bob Nudd
- NOAA staff: Colleen Coogan, Mike Asaro, Allison Rosner, Ainsley Smith, Mark Minton, John Almeida, Chip Lynch, Peter Burns, Barb Zoodsma, Eric Thunberg, Kathryn Bisack, Christin Khan, Eric Matzen
- Invited Guests: Mark Baumgartner (WHOI, NARWC), Rene Cloutier (ME Marine Patrol), Greg MacEachern (Edgetech)
- CONCUR: Scott McCreary, Bennett Brooks
- OTHER: Sharon Young (TRT member), Mason Weinrich (TRT member), Pat Keliher (Commissioner, Maine DMR), David Borden (Offshore Lobster Assoc, TRT member), Erica Fuller (CLF), Samir Patel (Coonamessett Farm Foundation)

**Meeting Materials**

Background materials were provided in advance to support the group's deliberations. Of particular note was the summary of the workshop entitled *Overcoming Development, Regulatory and Funding Challenges for Ropeless Fishing to Reduce Whale Entanglement in the U.S. and Canada*, held by the New England Aquarium and WHOI on February 1, 2018. Printed meeting materials can be obtained by contacting Colleen.Coogan@noaa.gov, or by phone at (978) 281-9181.

**Summary:**

Below is a brief summary of the main topics and issues discussed during the meeting. This summary is not intended to be a meeting transcript. Rather, it provides an overview of the main topics covered including action items.

## DAY 1:

Welcome and Introductions

Mike Asaro opened the meeting by thanking participants for participating in this effort and reminding them that the purpose of this subgroup meeting is to begin the investigation of the feasibility of ropeless fishing to create a report back to a full meeting of the ALWTRT in the fall of 2018. Subgroup investigations, as a structure to support deliberations of the full TRT, will be restricted to investigating feasibility, with no decision-making or conclusive information toward a rulemaking track. Any consideration of changes to the take reduction plan will only occur in consultation with the full Take Reduction Team.

Scott McCreary and Bennett Brooks reviewed operating protocols, terms of reference, and the agenda. They also reminded subgroup members that participants are responsible for reporting out to their constituent groups and bringing information from their constituents back to the subgroup. Overview slides summarizing Agenda items can be found here.

Discussion of existing ropeless fishing prototypes

Mark Baumgartner presented current ropeless fishing prototypes, focusing his first presentation on efforts to replace the gear identification and retrieval function of fixed pot gear end lines and buoys. Two basic prototypes were presented:

- Endline stowed on the bottom and retrieved on-demand with an acoustic trigger releases. Three examples reviewed:
    - *Desert Star Systems* bagged rope
    - WHOI bottom-stowed line spool; large spool with meticulously wound rope designed for offshore fishery in strong currents, with 180lb anchor and ½ inch line
    - EdgeTech rope stowed in plastic container, acoustic release
- Lift bags, attached to compressed air cylinder triggered by an acoustic release; commonly used for marine salvage, such as one being developed by SMELTS

The *Desert Star* bagged rope model is the only prototype currently being used in a commercial fishery, an Australian trap/pot fishery for rock lobster since 2013 to fish about 300 traps.

Patrice McCarron presented Kristan Porter's account of his observations of the Queensland fishery, which identified key differences that could make the Desert Star System more effective in the Queensland fishery than it may be in a U.S. trap/pot fishery. This is a high value fishery with only about 40 fishermen fishing under low fishing densities. Target species behavior (rock lobster are social so large traps hauled infrequently are effective), trap raiding challenges in the Queensland fishery, and other differences in the fisheries also contribute to both incentive and effectiveness of the Desert Star system for some Queensland fishermen.

Mark Baumgartner also presented concepts to resolve potential gear conflicts as a result of ropeless gear. Mark suggested that trap modems could serve the same function as surface buoys. He presented technology that could make position and orientation of gear available to all fishermen, with only the owner and enforcement able to identify registration/permit information and recall the buoy. Single pots and both ends of trawl lines would be acoustically marked; modems from the gear would acoustically transmit data to vessels. Vessel modems would scan for traps. The trap

modems and the modems of passing vessels could actively triangulate and alert owner of latest gear location. Specific gear location and ownership data would be securely stored in a cloud database. Fishermen would have access to only their own gear data while law enforcement and fishery managers would have access to all gear data.

Mark noted that the detection technology is currently still in the research and development stage and is therefore expensive. Further research and development, and ultimately market demand, could bring costs down.

Rene Cloutier with Maine Marine Patrol identified numerous enforcement feasibility challenges as well as operational concerns, which generated a discussion of commercial fixed gear fishery operational feasibility issues, listed below.

There was a discussion about timing, intention, and messaging. Lobster industry representatives expressed concerns that that current media campaigns are inaccurate (1) pointing the finger specifically at lobster gear and (2) suggesting a practical ropeless future in the near term. Industry representatives suggested that serious efforts should be made to clarify messaging. Some participants suggested that messaging from the TRT efforts should provide additional context regarding current take reduction goals, responsibility for recent increase in mortalities, and appropriate scale of response - both in time (immediate solution needed to decrease right whale mortality, some measures are available immediately, some are in the research and development phase) - and in area (response should be greatest in area where increase in mortalities is greatest). That is, messaging should clarify that response should align with where interactions occur (i.e., where modifications to the Take Reduction Plan may be needed). The scale of anticipated costs should be accurately expressed, as well as scale of credit given for existing and developing solutions (for example, Maine lobster industry is at the table identifying area-specific potential solutions, other fixed gear industry not as engaged). Without that context, there was concern that industry may be discouraged from engaging in problem solving.

On a related note, TRT members observed that that the scale of response should match the goal of saving whales. Currently effective ropeless technology that is enforceable and operational on a large scale is neither available nor affordable for all fixed gear fisheries and areas. A ten-year timeframe was frequently mentioned in order to have ropeless fishing technology available for consideration in commercial fisheries. Some participants believe that there are areas where whales are not injured or killed in fixed gear fisheries where ropeless fishing is not needed. Others pointed out that right whale distribution and movements are shifting and unpredictable. Some general findings:

- There was general support for continued exploration of this technology as an alternative to closures to refine its features so that it may become more effective, affordable and available. Industry members of the subgroup did not support ropeless fishing as a broad scale solution for commercial fixed gear fisheries. However, there was support for industry involvement to ensure further development of ropeless technology under commercial fishing conditions, with a focus on existing closed areas to provide incentive and the right conditions for development (such as highly observed, local knowledge of fixed and mobile fishing practices, whales present).
- Participants agreed on the need for better information about where whales are vulnerable to fixed gear fishing and, therefore, where additional conservation measure are needed. Several subgroup members cautioned that whale distribution may well continue to shift,

whales can be very broadly dispersed, and tagging or other distribution studies may not show definitive or enduring distribution.

Additional Research Discussion

Launching an extensive cooperative research project to test ropeless fishing for multiple fixed gear fisheries under commercial fishing conditions would be costly; John Haviland suggested costs exceeding $450k. At this time, private organizations plan to field test components of the systems to refine understanding of ropeless fishing effectiveness and applicability.

Summer 2018 planned ropeless research was identified:

- The spooled rope system will be tested further during mid-summer in New England.
- EdgeTech (Greg MacEachern) plans to field test (not under commercial fishing conditions) a new prototype in July and August in Buzzards Bay, and in Fort Lauderdale, Florida. Tests will be done at 60-70 foot depths, but new prototypes can hold 400 - 600 feet of ⅜ inch line.
- Canadian snow crabbers have expressed interest in voluntarily testing ropeless gear this summer for potential application in their fishery. (This was mentioned in post-meeting media reports.)

Testing locations with these features or attributes should be considered:

- Mobile gear closures areas were identified as possible areas for testing.
- Areas with high density of lobster trawls would allow for testing the precision of modems and gear conflict avoidance performance
- MA and Great South Channel restricted areas would provide incentive for commercial lobster fishermen to participate in trials under commercial fishing conditions.
- Any new fixed gear fishery should pilot with ropeless technology

The subgroup discussed prioritizing further research to identify and predict where whales become entangled in ways that cause serious injury and mortality. Particular priority should be given to understanding the changes in distribution and habitat use since 2010.

- SERO was unable to move forward this winter with its plan to tag right whales on the breeding grounds since the whales didn't show up. Plan is to use those limpet tags in the Gulf of St. Lawrence this summer.
- Two concerns were identified about tagging:
    - Study the effects of tags on the reproductive fitness of females - anticipating a paper on negative effects of tags on humpback reproduction.
    - Individual tracks are informative, but variable, limited and can be misleading by themselves.
- Industry participant suggested potential benefits of investing in R&D to develop longer-lasting, safer tags that could provide insight on extent of right whale distributional shift, identify unknown habitats and provide insight on changing whale behavior
- Summarize aerial surveys and prioritize survey effort determining where the bulk of the population is during most months.

An ALWTRT webinar on tagging and survey work may be possible in late summer to discuss the status of ongoing knowledge and efforts to research whale distribution and movements as well as any further research anticipated.

Defining "ropeless fishing"

The subgroup considered the definition of ropeless fishing offered at the WHOI/NEAq workshop as a starting point to develop a working (non-regulatory) definition to ensure that there was a common understanding of the term. That definition was: *Trap fisheries that avoid the use of rope in the water column to minimize the risk of entanglement of large whales, turtles and other marine vertebrates*.

Suggestions included:

- Remove the purpose (. . . to minimize the risk of entanglements . . .).
- The subgroup was concerned that gillnet, aquaculture and other fixed gear fisheries were not sufficiently encompassed by the definition.
- There were related concerns that the definition should not suggest there would be no gear in the water column since there are some fisheries (e.g., gillnets) with gear that occupies a portion of the water column on the bottom. The subgroup chose not to define what particular height or profile in the column could be allowed.
- The working definition should not define the method of retrieval, such as references to acoustically released gear, since that could unnecessarily preclude other bottom gear retrieval options.
- The definition was not meant to exclude the use of sinking groundlines; given that since sinking groundlines were adopted, they have not been observed in large whale entanglements.

Ultimately the working definition below was adopted, with a suggestion that, going forward, a different term such as "fishing without vertical line" might be used rather than "ropeless" to avoid the impression that the gear would be entirely ropeless, something like:

> *For the purpose of the Ropeless Feasibility Subgroup, our working definition of ropeless fishing is fixed gear fished without vertical lines connecting a surface buoy to bottom fishing gear prior to retrieval.*

Feasibility Considerations

Many feasibility considerations were identified over the course of the discussions. A quick list is provided below which it complements the list used for the feasibility matrix.

Cost/economic impacts:

- High cost (e.g., $140k per fishermen possible for *Desert Star System*); costs expected to decrease with production
- Potential impacts on support services: rope manufacturers, dealers could be affected if gear and scale of fishery changes
- Scalability considerations - along entire cost. All fishing and enforcement vessels (including mobile gear vessels) would need acoustic transponders to know where pots are deployed and avoid gear conflicts.
- Consideration of maintenance and replacement costs
- Potential savings in reduced gear loss and reduced endlines
- Changes over time from research and development phase through operations
- Impact on R&D support for right whale observation efforts (surveys, tags, efforts to locate them) and other gear solutions by diverting funds to ropeless gear R&D

- Early adopters potentially absorbing higher costs (and source of funds)
- Anticipated loss of revenue due to increased retrieval and resetting time

Operational concerns:

- Basic performance questions: further research is needed to clarify the many unknowns about gear performance (detection range, early release, no release, operational time, acoustic reliability)
- Satellite coverage is minimal in many areas offshore Maine
- Local knowledge is needed to create fine scale approach
- Post-storms, even with surface gear, may take many trips to find and retrieve all trawls for offshore vessels.
- Depth: So far only tested up to 200 fathoms
- Range: concerned about range at various depths and bottom types
- Operational: Burn wire is time-intensive and precise, hard to reset gear/set burn wire in seas
- Search for gear without surface marking could require longer search/travel time and gas
- Safety concerns - hauling it in, handling large gear like spools in weather
- Deck space/portability issues
- Increased hauling and setting time

Gear conflict concerns:

- In densely fished areas; setting over could occur due to imprecise GPS
- Mobile gear fisheries may not be able to adequately detect and fish around dense gear fields of ropeless gear.
- All fishing vessels (mobile, not regulated) would need technology aboard vessel to avoid massive gear conflicts.

Enforcement:

- Enforcement would need multiple recall and deployment technologies if ropeless gear is required and based on operational specifications vs. specific gear requirements. Multiple deployment systems and modems would be hard for enforcement vessel to accommodate; suggest that acoustic modems be required to have the same release specifications
- Concerned that costs and revenue loss caused by increased operational time could encourage illegal sets with floating ground line to allow grappling in lieu of surface system
- More detail expected from an ASMFC Enforcement group charged with looking at this issue; anticipated May 1

Acoustic impact on whales:

- Sofie Van Parijs (slide 11 from this presentation) shared her best professional judgement based on a review of information from ropeless.org that indicated that the modem is not in the range of marine mammals and fish, transmission is short, therefore only a minor change in the noise environment is anticipated against existing noisy underwater background.

Following the presentations and initial discussions, Subgroup members broke up into small group to fill out the "feasibility matrix" drawn from the February teleconference to characterize the nature and extent of the various feasibility challenges (small, medium, or large) and to provide further details. This matrix can be used both inform researchers of areas of concern, and/or inform NMFS and the subgroup on further investigation needed to inform the full TRT. Although the spooled line was not one of the alternatives considered, feasibility characteristics similar to the bottom stowed bag were identified, although there were greater concerns about portability and storage of the

spools, safety of hauling the large spools onboard, and concerns about expense and logistics around getting the line re-spooled.

Public comment

Commissioner Keliher (ME DMR) reaffirmed the importance of the Maine lobster industry to the coastal economy, up to a half billion dollars in landed value. He expressed his concern that the development of ropeless technology so far has been done without context of how the fishery works or what the fishing culture is.

He stated that ropeless fishing is not a priority for the state of Maine, that he believes Maine's fishermen have a good track record with low incidences of entanglements and high compliance with existing requirements. Effort is devoted to enforcement, with 6 enforcement vessels. Fishermen are inviting him to meetings to discuss how they can make positive proactive changes by modifying their gear. He believes federal funding will be required to make a change, and that any changes have to recognize local conditions such as huge tide ranges and associated currents, as well as diverse coastline and fisheries (from skiff fishermen to offshore fishermen). Commissioner Keliher committed to attending these meetings so he could be available as a resource should the subgroup have any questions.

## Day Two:

The day opened with a review of the Day One feasibility discussion, with some subgroup members continuing to voice concerns about the costs of ropeless fishing and industry's perceived mismatch of aligning ropeless technology across the scale of the lobster fishery.

There was a brief restatement of the goals of this Ropeless Fishing Feasibility Subgroup: to explore the feasibility and potential of this technology despite uncertainty regarding when and where such ropeless fishing may be implemented. Support was given to pilot field testing in closed areas under commercial conditions with fishermen's involvement.

The subgroup adopted the working definition of ropeless described earlier, and then proceeded into a discussion of the regulatory modifications required to fish without surface systems marking the location of fixed gear.

Peter Burns reviewed the federal lobster surface gear requirements, and discussed the Exempted Fishery Permit (EFP) process that could conditionally allow exemptions to the surface gear marking requirements.

Mike Asaro discussed MMPA regulations, which do not specifically require surface systems. Per the earlier discussion about facilitating ropeless fishing research under commercial conditions, he identified an opportunity to implement a technical amendment to the area closure to prohibit vertical line rather than wholly prohibit lobster fishing. However, surface systems are required under the Lobster FMP. Fishermen would have to get an Exempted Fishing Permit to be exempted from the Lobster FMP surface system requirements for an experimental fishery. Following permit conditions, fishermen could commercially harvest lobster in the currently closed area. Restating the premise that this subgroup is not a decision-making group, Mike proposed that NMFS could begin

working on an analysis of this option to have prepared if, in the fall, the ALWTRT supported this change to the Take Reduction Plan closed area restrictions.

John Haviland expressed concerns about personal liability under an EFP if a whale is caught due to a malfunction resulting in the early release of a buoy and line. Bob Glenn suggested that Massachusetts could apply for the EFP and individual fishermen could be covered by the state permit. This would be supplemented in state waters through the state's authority to issue research permits or letters of authorization for state water fisheries, with permission from NMFS (which would be part of the EFP).

Considering Costs

Given the broad range of concerns about costs of ropeless fishing technology, particularly across the time scale of research and development through implementation, and the scale of the fixed gear fisheries, Kathryn Bisack and Eric Thunberg presented a review of costs considerations and how they would be analyzed for federal rulemaking purposes.

Kathryn presented the use of pingers, in the Harbor Porpoise Take Reduction Plan as a case study. She reviewed the time line from pinger development through implementation to give perspective on the potential timeline for implementing ropeless fishing, which has four separate technology needs identified and is more complicated than pingers. Multiple phases/steps from "Development and Evaluation of a Prototype" to "Implementation (proposed rule, EIS, monitoring and compliance)" exist. Analyses mentioned include an experimental/exempt fishery to test operational feasibility with a benefits cost analysis of protection provided, "unit" demand analysis to assess the scope and economies of scale, which provides input to manufacturers to assess the cost of a unit along with unit maintenance and reliability estimates and an operational production time schedule. Research and development costs were likely to be included in the price of the technology development upon implementation. It was noted that when first adopted, pingers were subsidized by government funds and today some sectors buy pingers in "bulk" which may help reduce costs. A broad range of short and long term example alternatives was discussed (from grappling through ropeless) along with the various tradeoffs the TRT would consider before alternatives are adopted. The economist's pointed out that ropeless fishing is one of many potential policy instruments (i.e. mitigation methods) available to reduce the risk of NARW entanglements. The key take home message is to consider the costs and benefits of protection simultaneously; comprehensively evaluate a suite of protection measures all together to understand the cost and benefit tradeoffs of the different protection measures, in the short and long term, to improve the chances of right whale recovery.

Moving forward for full TRT consideration

A representative of the Maine lobster fishery expressed her view that ropeless is not compatible with Maine lobster fishery, and that there is a disconnect between the urgency of reducing impacts of fisheries on right whales and the long-term research and development requirements for ropeless fishing technology. She proposed focusing the energy of the TRT on short-term solutions while others research ropeless fishing. Acknowledging the need for fishermen's participation in the

process, she supported cooperative commercial fishing research. With input from the subgroup, the following was suggested as an appropriate way to move forward:

1. Consider allowing ropeless fishing in the lobster fishery in closed areas.

- Closed area access will require a relatively simple regulatory amendment to the TRP regulations and approval by the full TRT in a Fall 2018 meeting. Mike Asaro suggested that NMFS can prepare analyses that can be folded into regulations and supporting NEPA documents fairly quickly if TRT approves in the fall, effective by the next closure period (Feb 2019).
- This subgroup can make recommendations to ALWTRT regarding best practices criteria that they have identified regarding when and where ropeless fishing could occur, and can suggest specifications they have identified as important, such as common acoustic release mechanisms. The TRT could delineate where and how ropeless should be allowed, perhaps as conditions to be considered for EFPS. The subgroup suggested developing potential priorities such as:

    - Choose criteria that foster competition to propel progress (short term and long term)
    - Maintain fishermen voice in process
    - Focus research where there is risk (high abundance of whales, whales exhibit high risk behavior such as feeding or mating)
    - Potential area criteria:
        - Provide access to closed area (Mass Restricted Area closure).
        - In geographically discrete areas (fishermen with local knowledge about conditions and fishing practices).
        - To allow researchers to have access to waters with high co-occurrence of whales (if known).
        - New fishing grounds that fishermen may see as incentive.
        - Areas of low density for fishing both lobster and other fisheries, unless restricted by other regulations (for example ASMFC fishery restrictions remain in place).
        - Consider additional factors for testing, including deeper water and different kinds of fishing operations, gear conflict-free zones such as areas closed to mobile gear, or densely fished areas where effectiveness of gear detection can be tested.
        - Consider requiring for emerging fixed gear fisheries, and aquaculture to keep other fisheries from adding rope to water.

2. Supporting the development of ropeless fishing in closed areas and development of associated best practices does not directly address right whale conservation urgency. The attention of the Team and the subgroups should focus on other measures such as whale release rope to drive near-term conservation. They suggest that the Team identify tiered priorities for both implementation and research funding across the two workgroups.

3. Focusing the attention of the TRT on near-term conservation measures such as whale-release rope relies on E-NGO and private (ropeless.org) investment in the ropeless research to propel progress as their research and development efforts move forward. Fishermen can and should participate. The subgroup is confident that there is sufficient representation in TRT membership to ensure that ropeless research results will feed back into the TRT process.

**Next Steps:**

- Finalize and distribute Key Outcomes document - Colleen will draft with input from subgroup, reflecting the recommendation listed above.
- Use the list of feasibility concerns included in Key Outcomes to inform gear developers and researchers.
- Within a combined subgroup feasibility report, reflect tiered priorities of near-term considerations such as whale release rope, and long term development of ropeless fishing technology. Provide the list of priorities and considerations, above, for the ALWTRT to support the Team's development of best practices and permit conditions related to ropeless fishing.