



# The Commonwealth of Massachusetts

## Division of Marine Fisheries

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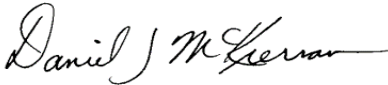
RONALD S. AMIDON  
Commissioner

DANIEL J. MCKIERNAN  
Director

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### MEMORANDUM

TO: Marine Fisheries Advisory Commission (MFAC)

FROM: Daniel J. McKiernan, Director 

DATE: January 22, 2021

SUBJECT: **Ropeless Fishing and the Opportunities and Challenges to Reduce Entanglement Risk**

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#### Background

For as long as lobster traps have been set in the ocean—dating back to at least the 1800s—fishermen have deployed vertical buoy lines to allow the owner to retrieve the gear and to mark the presence of the gear. Surface markings allow other fishermen to avoid setting other fixed gear on top of the marked traps or dragging mobile gear over and through the marked traps. However, given the current status of the North Atlantic right whale (right whale)—and the fact that these whales may be harmed or killed by entanglements with vertical buoy lines—there is a movement among technologists, conservation advocates, and some NGOs to require that fishermen move away from this traditional fishing method.

These individuals advocate for “ropeless” fishing. This refers to the deployment of on-demand fixed fishing gears that do not rely on vertical buoy lines and surface buoys to mark the gear presence and then allow the hauling of the gear and the catch from the ocean floor to the vessel. Most on-demand systems feature a buoy and line that is bundled at the trap and released to the surface by a remote device operated by the fisherman, thus allowing the gear to be hauled normally. Another design in the works uses compressed air tanks and an air bag that can be triggered from the vessel to bring the fishing gear to the surface.

DMF recently proposed a series of protected species regulations affecting fixed gear fishing and right whale conservation. In response, the agency received in excess of 2,000 pages of written comments and held two well attended virtual public hearings. While many of the unique comments received focused on the pros and cons of the proposed regulatory measures, the majority of the comments addressed an issue that was not among the proposed actions: the development of ropeless fishing.

Many of these comments pressed DMF to devise regulations to accommodate ropeless fishing. These comments were typically not from our usual stakeholders but instead were made by concerned citizens who have been convinced that ropeless fishing is the best solution to solving the entanglement dilemma. This included organized campaigns by groups that focus on conservation and animal welfare. Thousands of letters urged DMF to create a “pathway for permitting ropeless fishing gear,” citing the use of ropeless systems in “Australia, United Kingdom, Ireland, Canada and the West Coast.” These form letters simultaneously asked that regulations requiring vertical lines, “be revised entirely, in order for ropeless fishing to become legal in Massachusetts” and that DMF “implement measures that incorporate ropeless gear pilot programs in order to save the right whale.”

Given the public interest in this topic, I am providing you with this memorandum as a supplement to my recommendation on the protected species regulations. This memorandum serves to provide the MFAC with an update on ropeless fishing, as well as DMF's ongoing activities to investigate its potential and initiatives to develop the technology for state waters fisheries. While DMF's regulatory amendments proposed for final adoption address ropeless fishing only insofar as setting aside a section to establish regulations in the near future that will allow for experimentation with ropeless gear, DMF has and will continue to dedicate substantial resources to this issue. In summary, DMF has permitted some experimental development of on-demand buoy systems by gear researchers in the past two years; DMF has participated in the Ropeless Consortium meetings; and DMF has sought and been awarded a federal grant to examine the potential for ropeless fishing for New England's fixed gear fisheries. DMF is also working closely with NOAA Fisheries to develop uniform permitting conditions for ropeless fishing—a critical step given that NOAA Fisheries is on the verge of amending its fixed gear closure regulations to allow gears without “persistent buoy lines” in areas that would otherwise be closed to lobster trap fishing altogether.

### **The State of Ropeless Fishing Research and Public Perception**

There is a formal group working on this initiative called the Ropeless Consortium (Consortium), based in Woods Hole, MA. It is led by Dr. Mark Baumgartner, a renowned right whale researcher whose past work included habitat monitoring for right whales using bioacoustics and in-depth plankton studies to reveal habitat utilization by right whales. I recommend the MFAC become familiar with the work of the Consortium because the transition to ropeless fishing would be a profound change for not just the lobster fishery, but all fixed and mobile gear fisheries that share the ocean, and the Consortium's work would be at the center of such a transition.

The [Consortium's website](#) appropriately notes that “(t)o develop a rope-less fishery, however, many practical aspects need to be considered.” Moreover, their long-term vision recognizes the primary challenges include the need to detect the presence of the ropeless gear on the ocean floor. The most promising solution involves potential acoustic signaling devices on the end traps along with vessel-based signal receivers. The Consortium's vision of a ropeless future includes the establishment of a master database where all gear locations are stored together and regularly updated. This level of technology is analogous to the geo-spatial positioning features of our smartphones but would instead be specific to fixed gear in the region. Moreover, the Consortium is also researching how to extend this technology to all vessels fishing in the area (mobile and fixed gear) so that they are outfitted with receivers that can detect the devices on the ocean floor and then have these data get incorporated into the master database. Needless to say, there is much work to be done before ropeless fishing could serve as a widespread substitute for traditional gear marking through buoys on the Atlantic coast, where multiple fisheries operate in the same time and space.

While public perception may be that ropeless fishing *is* an alternative that *can* provide conservation benefits to the right whale today, the truth is that ropeless fishing *may become* an alternative that *could* help provide conservation benefits to the right whale in the future. Conservation measures that can have an immediate impact have been incorporated into our recommended final regulations. That said, DMF remains committed to fostering research and development of ropeless technology and gear marking systems in the hopes that the technological, operational, and financial barriers to ropeless fishing that presently exist can be overcome.

### **DMF's Permitting of Past Ropeless Research**

State and federal regulations require the setting of vertical buoy lines at each end of a string of traps or on each individually set “single trap”. This matches the traditional way of fishing, allows for the presence of gear to be adequately marked to avoid gear conflicts, and provides an accessible buoy line for inspection

of the gear by law enforcement officers. As fishing without a buoy line and surface markers is unlawful in both state and federal waters, authorizations are required to test or deploy ropeless gear. Given that the gear is strictly experimental, DMF has issued a Letter of Authorization (LOA), under the authority of M.G.L. c. 130, § 80 and 322 CMR 7.01(7), to condition commercial fishing permits allowing the experimental gear research to be conducted by the authorized fishermen and collaborating researchers. (Attachment A)

Thus far, the research in Massachusetts waters has focused on “proof of concept” of on-demand retrieval systems. Efforts have occurred in Cape Cod Bay during the summer months, as it is a time when and place where fixed gear fishing is allowed. The buoy retrieval systems tested have been deployed on one end of a trawl with the other end marked as normal with a routine buoy line. Moreover, the tests have occurred only in favorable weather and sea conditions.

These research projects have been funded by NOAA Fisheries and a local NGO—the International Fund for Animal Welfare. Local fishermen and gear technologists—as well as their counterparts around the globe—have demonstrated that fishing gear can for the most part reliably be brought to the surface through an on-demand retrieval system. This part of the solution is relatively easy to achieve as a purely technological matter. This is unsurprising, as oceanographers and other marine scientists have been placing very expensive scientific equipment on the ocean floor and retrieving it using expensive on-demand retrieval systems for decades. It is not coincidental that the Consortium is located at Woods Hole Oceanographic Institute, as they have the most experience with these systems in the marine environment.

Fishermen and gear technologists who have considered on-demand retrieval systems as a future solution have identified additional challenges beyond retrieval that must be addressed before this type of gear can be universally adopted. In summary, the current cost of the devices is prohibitive for fishermen. Even more challenging, however, is fishermen and law enforcement do not have the ability to detect the presence of the gear on the ocean floor with sufficient resolution in the absence of buoys at the surface. In fact, the Consortium recently established a research fund to specifically address this issue as they have pointed out, “*(t)he development of mechanisms to physically retrieve fishing gear from the sea floor without the use of buoy lines is progressing rapidly, yet complementary methods to locate this ‘buoyless’ (or ‘ropeless’) gear have lagged.*”

Without knowledge of the presence of the gear on the ocean floor, it is unavoidable that fishermen will set over the gear. This can cause damage to the gear, or worse jeopardize the safety of the crew. For example, a scallop boat towing a dredge could tow through a string of lobster traps. This will likely cause extensive damage to the trawl and the drag, and if the scallop vessel becomes “hung up” on the gear it puts the vessel at risk of capsizing. Moreover, trap fishermen currently avoid setting their strings of traps over one another’s by using the visual cues that the buoy provides. Without this visual cue, lobster traps set on top of another’s traps could create dangerous tangles that put trap fishermen and crew at risk when hauling back.

### **DMF’s Grant to Assess Ropeless Fishing’s Potential**

My staff and I have been proactive on these issues by seeking and being awarded a grant by the National Fish and Wildlife Foundation (NFWF) to study the technological, operational, and economic challenges associated with ropeless fishing gear in New England (Attachment B). The work has begun and is expected to be completed later this year. The project will engage directly with fishing industry members from multiple fisheries including mobile gear and fixed gear sectors. Fishermen based in Massachusetts, New Hampshire, and Maine operating in state and federal waters will be contacted and interviewed about their fishing practices and potential for successfully modifying their gear and fishing techniques using this novel gear. In addition, the project includes direct engagement with non-fishing industry participants including staff of fishermen’s organizations, gear manufacturers, fishery managers, law enforcement

officials, and private/public sector experts in telecommunications and spatial database management. This project will identify the data and technical requirements of widespread deployment of on-demand fishing gear technologies and recommend next steps for overcoming technological obstacles.

The project will focus on the fixed gear fisheries in New England that might use on-demand fishing gear, as well as the fixed and mobile gear fisheries that might interact with the unbuoyed gear. Fishery participants are expected to contribute to the discussions from the following fisheries: lobster trap, whelk and fish trap, scallop dredge, surf clam, and bottom otter trawl fisheries operating in state and federal waters off the coast of New England. This project will produce a report summarizing these challenges, opportunities, and requirements, while generating a set of research priorities and recommendations for further evaluation. DMF was chosen for this grant because of our past successes with collaborative research with programs with the fishing industry.

Development of this new fishing method will require careful planning, substantial investment, and amendments to laws at both the state and federal level. For now, we will continue to work with the concept of ropeless fishing through experimental fishing programs.

### **Co-management of Exempted or Experimental Ropeless Fishing**

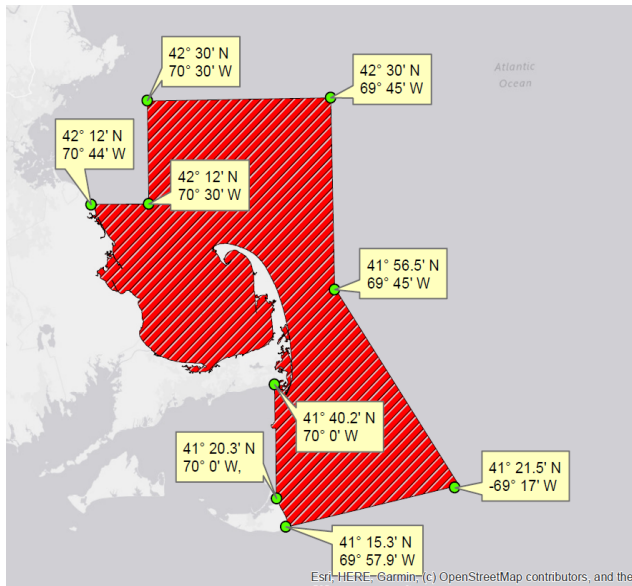
To more expediently authorize experimental ropeless fishing, there are some legal and jurisdictional challenges that need to be resolved at both the state and federal level. To this end, DMF is working closely with NOAA Fisheries.

NOAA Fisheries has proposed a new federal rule that will allow trap fishing without “persistent buoy lines.” If approved, it would transform the seasonal federal closed areas from absolute closures to the presence of trap gear to closures only to persistent buoy lines. This change would allow for ropeless fishing to occur in these closed areas, likely through the issuance of a federal Exempted Fishing Permit (EFP). Moreover, there is a companion federal rule concerning ropeless fishing in trap gear closure areas that NOAA Fisheries has not yet finalized, and was first brought to the public’s attention about two years ago through an advanced notice of proposed rulemaking ([Federal Register](#)). DMF anticipates that NOAA Fisheries will finalize rule making on these issues in early-to-mid 2021. Accordingly, DMF is collaborating with NOAA Fisheries to develop consistent cross-jurisdictional guidelines for vessel owners to apply for and receive a federal EFP and/or a state LOA to deploy experimental ropeless trap gear.

In the interim, DMF and NOAA Fisheries have received informal proposals from a few lobstermen who are identified as “pioneers” in testing ropeless systems. These fishermen hope to be able to use the devices donated by a government agency or an NGO to continue testing of ropeless gear in 2021, and thereby avoid the economic impact of the current Massachusetts Restricted Area (MRA) trap gear closure (Figure 1). We have been advised by NOAA Fisheries that under current federal regulations they are unable to accommodate such requests for fishing in areas closed to trap gear this year; allowances may be authorized in the future contingent on the completion of the federal rule making processes described above. Therefore, even if DMF wanted to grant permission for these fishermen to deploy ropeless systems in the state-waters portion of MRA this year, NOAA’s authority under the Marine Mammal Protection Act (MMPA) supersedes our authority regarding this closure, thus making the any decision by DMF moot. Accordingly, any ropeless systems testing this upcoming season, if approved by NOAA Fisheries or DMF, must be done in the waters that are not closed to trap gear by federal MMPA regulations. For example, if the MFAC approves DMF’s recommendation to close additional state waters beyond the federal closures to trap fishing, these waters could be used to test ropeless systems because federal MMPA regulations will not apply there.

If DMF were to allow this experimental fishing to occur in an area otherwise closed to trap gear, it would also be prudent to ensure this area is similarly closed to mobile fishing gear or mobile fishing gear does

**Fig. 1 – Massachusetts Restricted Area**



not occur in the area because it presents unfishable bottom (e.g., bounders, ledge). This will prevent potential gear conflicts and fisherman safety issues that may arise if this gear fished through unbuoyed and undetectable traps or multi-trap trawls. This also underscores the need for NOAA Fisheries and DMF to address challenges of ropeless gear detectability during the permitting process.

Additionally, the balance of liability issues may be altered by ropeless fishing. Under a longstanding state law, [G.L. c. 130, §31](#)<sup>1</sup>, it is unlawful for any person to damage another’s fixed fishing gear. Case law has established that mobile gear fishermen who damage lobster gear by towing a net or dredge through it are liable for the damage to that lobster gear. Using ropeless gear without closing the area to mobile gear fishing

makes it more likely that gear conflicts will occur because competing fishermen would be unable to detect the presence of unmarked gear. Can the inability to “see” the gear be a defense? This conundrum represents additional regulatory and legal challenges that should be addressed.

### **Role of the MFAC in Ropeless Fishing Development and Permitting**

Because the marine fisheries’ laws and regulations are longstanding and require vertical buoy lines, any permanent changes would require amendments to regulations and possibly statutes. Accordingly, the MFAC must be included in future deliberations on ropeless fishing. [G.L. c. 130, §2](#) provides that the MFAC shall, “make recommendations to the Director for the proper management and development of the marine fisheries of the Commonwealth” and [G.L. c. 130, §17A](#) establishes that the MFAC is to approve all DMF’s rules governing the manner of taking fish, as well as size limits, seasons and hours, numbers and quantities and the opening and closing of areas. Therefore, addressing the development of ropeless fishing is uniquely in the MFAC’s “wheelhouse”, as it will require DMF to consider substantial changes in fisheries management, regulate how gear may be fished, and allow or preclude the use of certain fishing gears in certain areas and at certain times.

Historically, the MFAC has not objected to me or past Directors allowing many kinds of experimental fishing “pilot programs” authorized by LOA, especially when there are no or minimal negative consequences on other fisheries or other users. In these cases, the Director weighs the benefits of the pilot program and reports to the MFAC the intent and developments of the program; the legal authority is accomplished through the Director’s ability to create permit conditions. Because of the potential profound impacts that ropeless gear could have on the co-existence of fixed gear fishermen among themselves and with competing mobile gear, the MFAC and the public should play a robust role in vetting any future proposals that will authorize ropeless fishing. While I will admit we are in uncharted waters on these matters, I am convinced that a more formal and thorough public process is warranted when considering applications for LOAs to engage in ropeless fishing.

<sup>1</sup> Section 31. No person shall, without the consent of the owner, take, use, destroy, injure or molest a weir, pound net, fish trap, seine, set net or lobster or crab pot or other fishing gear, or a fish car or other contrivance used for the purpose of storing fish, including any such fishing gear which is swept ashore by storm or tide or other natural causes and deposited upon the shore, beaches or flats, whether public or private, or take fish therefrom.

As stated previously, DMF is collaborating with NOAA Fisheries regarding the criteria for reviewing and approving experimental ropeless gear proposals. The federal proposed rule states that all applications for exempted fishing permits (ropeless) will be subject to National Environmental Policy Act review. I will routinely report back to the MFAC on a regular basis about our ongoing collaborative work on this subject. At this time though, I predict we will need to create state regulations governing applications for ropeless fishing similar to that seen in California.

### **Seeking a Model for Ropeless Fishing Regulations? See California**

The state of California faced an analogous situation with its Dungeness crab fishery, as entanglements of endangered species and litigation forced the state and industry to reduce takes through amendments to the management plan. California created a Fishing Gear Working Group comprised of commercial and recreational fishermen, as well as conservation groups and government representatives. As part of the litigation's settlement agreement, California took action to establish a seasonal closure at times when and in places where whales and turtles were more likely to be present and therefore entanglements were more likely. It should be noted that the closed season occurred during the spring and summer months when the fishery is less productive. Then, in fall of 2020, California DFG promulgated formal regulations allowing "alternative gear" to be fished during the closed season. Alternative gear was defined to include ropeless gear. This action was groundbreaking, and much can be learned from the California experience, particularly as the same ropeless device manufacturers and technologies being tested on the Atlantic coast are being tested in California.

In California, applications for fishing the alternative gear during the closed period are to be submitted to CA DFG for their approval. Standards as defined in the regulations can be seen below:

1. *Detectability: detectability by the department, fishermen and public, including description how location of Alternative Gear is available visually or virtually, equipment specifications including costs, and any required specialized equipment or training to deploy, operate, or detect the gear. If "ropeless," the gear must be used with software that enables department law enforcement and other fishing vessels within ¼ mile of the gear to identify the location of the gear at all times when it is deployed.*
2. *Retrievability: means of retrieval, including description of release mechanism, equipment and any specialized training needed to deploy and/or retrieve Alternative Gear, description of safeguards and procedures to minimize gear loss and ghost gear, with gear loss rates of no more than 10%. Gear must include a back-up release capability so it will surface in the event of an equipment failure and must include a gear recovery plan if the gear does not rise to the surface.*
3. *Ability to Identify: means of Alternative Gear identification, including the method or description of the mechanism required for the department to identify Alternative Gear to permit holder both remotely when submerged, and at the surface.*
4. *Benefit: evidence Alternative Gear reduces risk or severity of entanglement.*
5. *Enforceability: including means by which department law enforcement can find and retrieve the Alternative Gear at sea and costs of any necessary equipment and/or training. Department law enforcement must be able to retrieve and redeploy the gear.*

**Conclusion**

In conclusion there is significant work to be done to develop these technologies here in Massachusetts and New England and much can be learned from the California experiences.

**Attachments**

- A. June 23, 2020 LOA to Experiment with Ropeless Lobster Gear in Massachusetts Waters
- B. January 21, 2021 DMF Advisory Announcing Ropeless Fishing Gear Feasibility Study



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### LETTER OF AUTHORIZATION

#### To Experiment with Ropeless Lobster Gear in Massachusetts Waters

June 23, 2020

Eric Matzen  
NOAA NEFSC  
166 Water St  
Woods Hole, MA 02543

#### Vessels:

Peter Mason	Robert Martin	Michael Lane	John Haviland
16 Dorothy Rd	392 RT 6A	280 Gannett Rd	Beach St
Plymouth, MA 02360	Sandwich, MA 02537	Scituate, MA 02066	Green Harbor, MA 02041
F/V Kestrel	F/V Resolve	F/V Time Machine	F/V Emily Rose
Doc # 947399	Doc # 680154	Doc # 604547	Doc # 955822
Permit ID# 002543	Permit ID# 039670	Permit ID# 000126	Permit ID# 000598

This Letter of Authorization, issued pursuant to the authority at M.G.L. c. 130 § 80 and 322 CMR 7.01(7), hereby conditions the commercial fishing permits with Permit ID # 002543 (F/V Kestrel, Documentation # 947399), Permit ID # 039670 (F/V Resolve, Vessel Documentation #680154), Permit ID # 000126 (F/V Time Machine, Vessel Documentation # 604547), and Permit ID # 000598 (F/V Emily Rose, Vessel Documentation # 955822) to exempt them from trap gear marking requirements, set in accordance with 322 CMR 4.13, provided that the vessels deploy non-conforming lobster trap gear with the following configurations and fishing practices:

- Lobster trap trawls will be set with one compliant buoy line, compliant traps, and one ropeless system instead of the second compliant buoy line.
- The gear will be fished in locations chosen by the fishermen in Massachusetts Waters South of Harding Ledge and within the Cape Cod Bay

**This authorization expires January 31, 2020 unless sooner revoked for cause.**

Daniel J. McKiernan, *Director*





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January 21, 2021

### Marine Fisheries Advisory

#### **Massachusetts Launches ‘Ropeless’ Fishing Gear Feasibility Study**

*Twelve-month project will evaluate fishing, legal, regulatory, technological challenges and opportunities of alternative lobster gear, which could reduce whale entanglements*

The Massachusetts Division of Marine Fisheries (DMF) has launched a comprehensive scoping project to assess ‘ropeless’ fishing gear in the New England lobster fishery. A first of its kind on an accelerated timeline, the project will interview dozens of fishermen, technologists, policy experts, and scientists to fully evaluate the challenges and opportunities of the new gear type. The project is funded in part by the National Fish and Wildlife Foundation in partnership with the National Oceanic and Atmospheric Administration (NOAA), the federal agency that manages our nation’s fisheries in federal waters.

‘Ropeless’ gear is a type of fishing gear that uses high-tech alternatives to the traditional buoy line equipment used in lobster, crab, and fish pots, and some groundfish fisheries. Most types of ropeless gear are designed to prevent entanglements with marine mammals including North Atlantic right whales using submerged buoys activated by time-release mechanisms or signals transmitted from the surface. While the body of prior research on ropeless gear has focused on the mitigation of risk to endangered marine life, there is still much to learn about the technological, legal, and regulatory ecosystems of ropeless gear as well as operational and economic unknowns for the region’s fishermen and coastal communities. DMF’s project will build our knowledge on each of these issues and produce a set of recommendations for future policy development and possible implementation.

“Ropeless gear represents a sea change for the fishermen who would use it or interact with it on the fishing grounds,” said Daniel McKiernan, director of the Massachusetts Division of Marine Fisheries. “As with any proposed experimental fishing gear type, ropeless gear warrants a thorough analysis, and the urgency of this important conservation and economic issue is motivating our agency to act quickly. Our project will close the loop on the subject by analyzing previously unaddressed opportunities, challenges, and requirements for the use of ropeless fishing gear, while taking the feedback of fishermen, conservationists, and all stakeholders seriously. This project puts the Commonwealth of Massachusetts in a central leadership role advancing marine mammal conservation and fisheries management in an intelligent, equitable, and collaborative manner.”

For more details about this project please click [here](https://www.mass.gov/service-details/ropeless-fishing-gear-feasibility-study) (<https://www.mass.gov/service-details/ropeless-fishing-gear-feasibility-study>) or send an email to [ropelessproject@mass.gov](mailto:ropelessproject@mass.gov).