

Near-term development

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Where are we now?

Phase 1
Development and
Evaluation

Phase 2
Experimental Fisheries

Phase 3
Operational Use

From 2018 Ropeless Workshop Report: Baumgartner, M., M. Moore, S. Kraus, A. Knowlton, and T. Werner. 2018. Overcoming development, regulatory and funding challenges for ropeless fishing to reduce whale entanglement in the U.S. and Canada. Woods Hole Oceanographic Institution, Woods Hole, USA, February 1, 2018. 45 pp.

Phase 1: Development and Evaluation

Fishermen, manufacturer,
and engineer
engagement

Gear retrieval and gear
location prototype
development and
engineering tests

Gear retrieval prototype
testing with fishermen

Gear location prototype
testing with fishermen,
enforcement, and
regulators

Development of data
warehouse (cloud
services)

Certification program

Phase 2: Experimental Fisheries

Manufacture needed
equipment

Incentives
Pre-experiment training
Post-experiment evaluation

- Around 15 fishermen use ropeless methods operationally for 1-2 seasons in a particular fishery
- Establish 3 fisheries? U.S. east coast, U.S. west coast, Gulf of St. Lawrence in Canada?
- At conclusion, evaluate goals of operational feasibility, user friendliness, short handling times and enforceability

Phase 3: Operational Use

Manufacture needed
equipment

Subsidies

Entire fisheries convert to ropeless fishing methods

Phase 1: Development and Evaluation

*Good progress –
Ropeless Consortium
meeting is helpful*

Fishermen, manufacturer,
and engineer
engagement

*Great progress for gear
retrieval, need more
work here for gear
location methods*

Gear retrieval and gear
location prototype
development and
engineering tests

*Trap Tracker and
Ropeless Fisher apps are
a great start*

Gear retrieval prototype
testing with fishermen

Gear location prototype
testing with fishermen,
enforcement, and
regulators

Development of data
warehouse (cloud
services)

*This is starting, but we
need to better
articulate what we are
seeking to achieve with
these tests*

*Progress with GPS
approach, less progress
with ranging, and none
with SART self-
localization*

Certification program

No progress to date

Where should we go?

- What is the purpose of testing?
- Gear location methods
- Develop an independent gear cache
- Support experimental fisheries
- When can we go ropeless?

What is the purpose of testing?

- To make sure its safe for fishermen to use
- To make sure its does what its supposed to do, and in so doing, is safe for whales
- To elicit feedback for improvements from fishermen
- To understand the impact of ropeless fishing on handling times and catchability (i.e., factors that affect revenue)
- To demonstrate the technology to many stakeholders, such as other fishermen, regulators, conservationists, and the public
- To do all of this for as many gear types as possible, since not all gear types will work in all areas or fisheries
- We need to develop our testing protocols with these goals in mind

Gear location methods

- Because retrieval triggering and gear location needs to be interoperable for both enforcement and addressing gear conflict, we need to decide on what gear location methods we will use going forward. \$
- What information do we need to make that decision?
- Who gets to make that decision?
- Once decisions are made, we need to
 - Encourage manufacturers with appropriate expertise to develop systems to localize gear at the sea floor \$\$\$
 - Identify communication and data protocols
 - Incorporate these systems into existing retrieval systems

Develop an independent gear cache

- Purchase gear for testing today and for use by fishermen in **\$\$\$** experimental fisheries in (hopefully) the near future (Phase 2).
- Current manufacturers are relatively small companies and few have the resources to donate substantial amounts of gear for fishermen to use.
- Ropeless gear is currently very expensive because most of it is in the prototype phase. Prototypes are usually hand made one at a time and do not take advantage of any manufacturing processes that can cut costs.
- The gear cache idea puts gear in the hands of an independent third party that cannot pick winners – the federal government. They can maintain the gear, train fishermen, collect data at sea, and share the resulting data with all stakeholders.

Support experimental fisheries

- The right whale problem is urgent, so how can we speed up development of ropeless fishing? Experimental fisheries.
- We will learn more information about operational ropeless fishing with an experimental fishery than we will any other way.
- Areas need to be chosen carefully until a full-scale gear location methodology is developed to address gear conflict. Do such areas exist, and can we establish experimental fisheries there?
- Experimental fisheries do the following:
 - Create advocates for ropeless fishing in the fishing industry
 - Create a market for ropeless manufacturers' products
 - Create demand for ropeless gear that can encourage mass production and an associated reduction in purchase price

When can we go ropeless?

- We are in the early stages of development – mostly proof of concept with prototypes that are not yet designed for operational fishing by hundreds to thousands of fishermen.
- Every system you have seen today will need to go through a re-design process to (1) incorporate an interoperable gear location system, (2) work for fishing at scale (e.g., ruggedized design, long endurance), and (3) enable mass production at low cost.
- We will move at the pace at which we are funded. While there are some technical issues to work out (e.g., gear location methodology), we are at a place where we are mostly resource limited. We can engage more fishermen, complete testing, develop gear location systems, and ensure interoperability among systems faster with more resources.

Thank you