

## Ropeless Consortium 2023 Trip

Last month, OceanWatch Australia was granted an educational travel bursary from FRDC to attend the Ropeless Consortium conference in Halifax, Nova Scotia with five trap fishers from around Australia to learn about current developments in ropeless fishing gear. The trip brought fisher representatives from the Queensland Spanner Crab fishery, the New South Wales Ocean Trap & Line fishery, the Victoria southern rock lobster fishery, the South Australia southern rock lobster fishery, and the Western Australia western rock lobster fishery. During the week in Halifax, the group attended the conference, gear demonstrations, and various meetings with gear developers, Canadian and US fisheries representatives, and local fishers. The group will be holding an online national Q&A workshop on Thursday, 29<sup>th</sup> February 2024 to discuss potential directions forward and answer any questions you may have.



Pictured: (left to right) Jonathan Brocklesby (Victorian Rock Lobster Committee), Mat Thompson (Western Rock Lobster Association), Mitch Sanders (NSW Ocean Trap and Line), Kristin Hoel (OceanWatch Australia), Simon Rowe (Southern Rocklobster Limited), Andre Gorissen (Fraser Isle Spanner Crab)

## Ropeless Gear Innovation

Ropeless fishing gear innovation has quickly progressed out of necessity in North America in efforts to help protect the endangered North Atlantic Right whale population (an estimated 350 individuals remain) on the East coast and further protect humpback and blue whale populations on the West coast. The decline in these whale populations led to snap closures of some fisheries (e.g. Dungeness crab fishery) and has heavily impacted fishing operations around North America. For example, lobster fishers in Northeast North America have been subject to a host of regulation changes and zone closures, requiring fishers to steam over 90 miles to reach open fishing zones or drastically change their fishing strategies and gear. There is also notable pressure from the conservation sector towards promoting “whale safe” fishing practices and seafood, as Atlantic lobster has been downgraded to “avoid” on Monterey Aquarium’s Seafood Watch and has had its Marine Stewardship Council certification suspended due to the fishery’s interactions with North Atlantic Right whales.

Since the Ropeless Consortium’s inception in 2018, it has brought together gear developers, fisheries experts, conservation organisations, and local fishers to discuss viable solutions towards minimising

fishery impacts on whale populations, adjusting regulations, and reducing the amount of rope in the water column, ultimately to allow fishers to continue fishing. The current goal is not to entirely replace traditional trap gear, but rather to offer solutions for fishers to continue to fish in areas that are closed to fishing during the whale migration season. Like Australian fisheries, each fisher runs their business in a unique manner, so there is no one-size-fits-all technology change will be a viable solution for every fisher. Current gear developments range from simple time-release mechanisms which can easily be added to traditional gear to high-tech acoustic release systems with underwater GPS capabilities. Both the United States and Canada have gear lending library systems that allow fishers to trial different ropeless technology to determine what best suits their fishery/fishing practices. Although North America has made huge strides in gear development, it is evident they still have a long way to go before ropeless fishing becomes a viable solution for their fisheries to fully commit to. There were notable issues with affordability of gear, protocol for compliance, gear developer competition, and other underlying politics between the United States and Canadian fisheries which seem to contribute to delaying a feasible ropeless fishing solution by 2028.



### Australian Fisher Key Takeaways

This trip provided the group with a more solid understanding of the different prototype options that are currently available for ropeless fishing and how the systems are being implemented abroad. Although none of the group came back completely sold on the idea of adapting their fishing operations to ropeless, there was a unanimous understanding that it is important to be proactive in our Australian fisheries' approach to whale interactions. Trialing new technology that can benefit both fishing operations and the environment may help future-proof the industry should whale interactions increase or their populations decline. Additionally, should "whale safe" become a new

requirement for exported seafood, having trialed different options to further prevent whale entanglements could ease the transition process. Although making a complete swap to ropeless fishing is likely not viable, particularly for single-set trap fishing operations, there may be instances when it could prove useful and benefit fishers. Much of the gear the group learned about has additional benefits beyond just whale conservation, such as GPS location/range finding capabilities to help locate gear. Following demonstrations and conversations in Halifax, the fishers were keen to explore the utility of the following gear developers' technologies in their fisheries: Sub Sea Sonics, LiftLabs LLC, Blue Ocean Gear, NOVA Robotics, and Ashored.



Below is a summary of the group's overall thoughts on the different gear developers we met with during the trip. As the group represented five different Australian fisheries and all operate differently, they have each provided their personal perspectives regarding potential innovations to trial that may suit the needs of their respective fisheries. These interviews will be circulated in the coming months in preparation for the February 2024 online Workshop. Although this is a couple months away, we respect that December and January are among the busiest times for Australian trap fishers, and have delayed the workshop to promote greater fisher availability and attendance. If you have any specific questions you'd like answered prior to the workshop, please contact Kristin Hoel at [kristin@oceanwatch.org.au](mailto:kristin@oceanwatch.org.au) or 0422 618 248.

## Gear Developer Reviews

### Sub Sea Sonics

Timed and acoustic release system

Product specs:

- Timer system - \$300 USD/system
- Acoustic release - \$350 USD/system, \$1300 USD for deck box control system
- Depth limit – 150m
- Battery life – 4-6 months
- Can add steel wire to release line as a failsafe if the acoustic release fails (works like a GTR)
- Phone app for gear marking – can only see it within 500-1000m (like a surface float)
- Sub Sea Sonics only makes the release mechanism/technology – they work with Guardian to customise and retrofit rope-on-demand system to different traps
  - o Essentially attach mesh to trap with rope/buoys coiled within it





Sub Sea Sonics Time release system attached to trap (right) and with Guardian rope retrofit (left)

Benefits	Limitations
Simple and easy to use, designed with fishers in mind	Currently one-way communication from boat (don't know when the system has been activated)
Can retrofit to function on diverse existing gear	Unsure how to adapt for beehives (VIC/SA)
Dungeness crab fishery have 97-98% recovery rate of gear	Only works in ocean/brackish water due to electrolytic erosion tech used for release
Prototyping deepwater 2-way communication to track the acoustic units	
More suitable for doubles or lines – can have something to grapple for if it fails	
Programmed to release automatically if low battery	
No deck unit	

## LiftLabs LLC

Lift bag system that attaches to traps

Product specs:

- \$1000 USD/system + \$4000 USD for deck box
- Depth rating – 80m
- Battery life – 6 months
- Can add failsafe time release if necessary
- Use Sub Sea Sonics tech for gear marking

Very open to fisher feedback and adapting the gear as necessary to make it more useful for industry. Will be adapting and trialling an offshore system with two NSW fishers in 2024 humpback whale migration season.



Left: LiftLabs system attached to trap; LiftLabs system refill setup (can customise to vessel needs)

Benefits	Limitations
Easily attach and detach from different traps	Current depth rating – 80m
Adaptable docking station for different boat set-ups to ready gear for redeployment	Still in development
Drains buoy and refills tank in less than 1 minute for redeployment	Likely better for inshore operations, but developing an offshore model
Compact system with two valves, not a lot of fiddling around	Large deck box
Simple gear marking system that uses an app for phone (doesn't need separate tablet)	Have to refill tank each deployment
Gear ranging – tells you how far away you are from the system (vertical and horizontal distance)	
Would be suitable for rocky reef	
Heavy – won't affect ability to set gear precisely	
Controlled ascent rate	

## FioMarine

Spool system

Product specs:

- Timed release & acoustic release
- Depth rating: 200m
- \$5000-\$10,000 AUD per system
- Battery life: Time release - 1 year; Acoustic release – 3-5 months

Currently developing a smaller, cheaper option – to be trialled in Tasmania late 2023/early 2024



Benefits	Limitations
All in one system	Ineffective design
Two-way communication, so you know where gear is	Problematic for precise trap setting as the spool is buoyant
Developer based in Tasmania	How do you re-coil it on the spool while using a hauler?
	Tough to see on surface
	Not cost effective for single traps

## Blue Ocean Gear

### Smart Buoys

#### Product specs:

- GPS location buoys
- \$1000 USD/system, plus a data plan for satellite transmission of data (~\$30AUD/month/buoy)
- Temp and depth data collection, data transmission at surface (working on collecting data for wave height, surface current speed, etc.)
- Depth rating: 400m





Benefits	Limitations
Buoy “wakes up” as soon as the gear hits the water, no need to remember to turn it on before deploying	A bit heavy, would require additional floats
Wireless charging	Doesn’t remove ropes from the water, but allows the system to be tracked remotely
Compact design	Wouldn’t assist in finding submerged lost gear, as only transmits location at surface, but will notify as soon as it’s back up to the surface (e.g. if it gets pulled up)
Location data and system integrated directly to vessel chart plotter	Probably more economical for strings vs single traps
Customisable alerts (e.g. gear removed from water unexpectedly, moving outside designated radius, gear surfacing, buoy speed, etc.)	
Can be added to any other gear system that doesn’t have GPS tracking ability	
Help save time and fuel if you know exactly where your gear is or when the headgear is surfaced	

## Desert Star

Rope on demand system

Product specs:

- Coastal system - \$4000 USD; Offshore system - \$10,000
  - o Includes one deck box and one acoustic release system
- Depth rating: 300m
- One-way and Two-way communication with range finding available, depending on the model
- Temperature and depth sensors
- Battery life: 1 year or 50 releases
- Burn wire that triggers the release



Benefits	Limitations
Reliable mechanics	Too many small parts that are easy to lose
Works the deepest of tested ropeless systems	Tough to thread wire
Small deck box	Mesh bags need to be packed precisely for proper redeployment
Can release multiple systems within range at once	Must build own bags, and promoted bag design isn't easy to properly recoil rope into to ensure effective redeployment
	Lots of little pieces/tools (e.g. wire, cutters, magnet, wrench) necessary for each redeployment
	Likely need to employ one deckhand specifically for redeployment

## NOVA Robotics

- Newer developer, primarily a tech company that is expanding into “ropeless adjacent” technology
- Working on several different products
  - o Sonar reflector
    - Potential to add to traps and be able to locate them through existing sounder – developer is willing to adapt the current design for fisher use
  - o Spring release rope recovery system
    - Basic spring mechanism that releases at a specified pull strength (e.g.
  - o Electronic Release rope recovery system
    - Timer and acoustic release options
    - Timer system \$500 CAD; Acoustic Release \$1000 CAD
    - Only requires a basic magnet
    - Built in smart buoy, so it's trackable at the surface
    - Acoustic system has 2-way communication, can do range finding underwater
  - o Small GPS location device to attach to buoys
- Video demonstrations of gear:

[Spring Release Demonstration](#)

[Tag Line Spring Release Theory of Operation](#)

[Tag Line Spring Release Underwater Deployment](#)

[Tag Line Spring Release Setting and Rigging](#)

[Tag Line Spring Release Calibration](#)

[Electronic Release Underwater Deployment](#)

[Electronic Release Setting and Rigging](#)

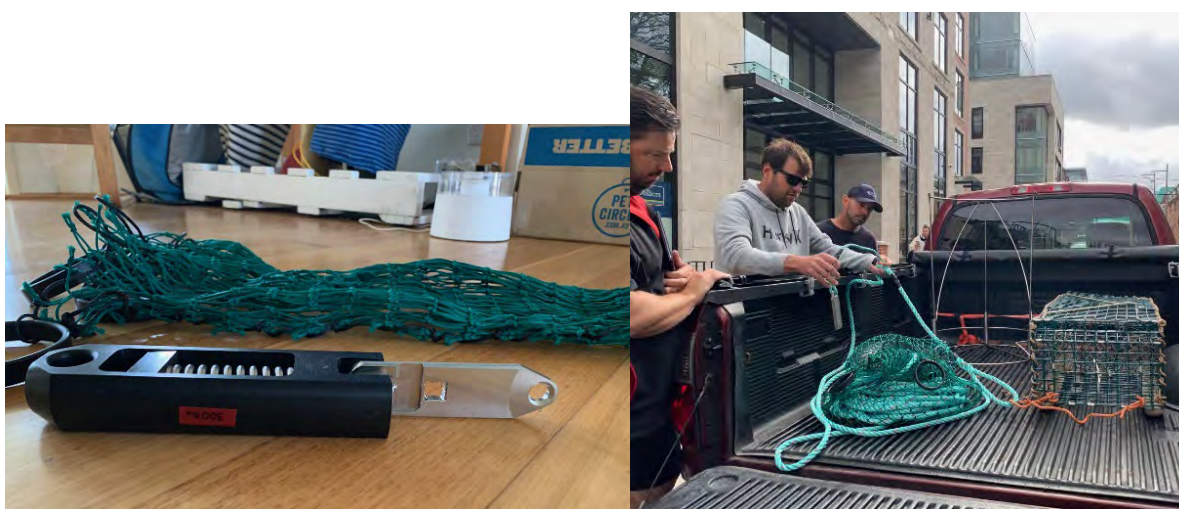
[Electronic Release Charging](#)

[Electronic Release Calibration](#)





Left: Time release system; Right: GPS location device (can be added to buoy or gear)



Left: Tag line spring release system with bag; Right: spring release system attached to rope/trap

\*\*Very open to fisher feedback and adapting designs to better benefit fishers

Benefits	Limitations
Small, compact, and basic system – easy to use	Still in development
Different options/configurations available	Doesn't actually remove rope from the water column, just cuts off head rope/buoy and deploys excess stored rope – would potentially add to ghost gear in the environment, but wouldn't move trap if ship or animal caught the rope
Only requires a magnet to set/reset	
Recharges via wireless phone charger	
Can be adapted to be a rope-on-demand system	

## Ropeless Inc

### Liftbag system

- 2 versions – cheaper system with one-way communication & expensive sled with two-way communication

### Product specs:

- \$1500 USD/bag system, \$4000 USD/deck box, \$35,000 USD/Single Ping Positioning system
- Anchored or attached to trap
- Depth rating: 160m
- Cheaper system: one-way communication; Single Ping Positioning system: two-way communication

### Demo notes:

- The expensive gear tracking system with the “through hull” transducer mount was impressive
- The cheaper non-trackable system they intended to bring to Australia for trials did not deploy properly
- Attached buoys for all of their demonstrations and seemed to have lower confidence in their gear

### *Cheaper system*



Lift bag systems that would be attached directly to traps or as an anchor on strings of traps



Over the side transducer system with associated deck box and tablet

## Expensive System



Left: Multiple lift bag anchor systems that would be attached to string of traps;  
Right: Single Ping Positioning system that shows where gear is located underwater (green dots)

Benefits	Limitations
Easy to deflate bag	Lots of different valves, quite complex to refill
Tall lift bag provides good on-water visibility of gear	Very expensive
Expensive system allows gear to be fully trackable while underwater and can integrate into chart plotter/onboard computer	Quite fiddly system
Can configure for backup timer release	Over-side transducers for cheaper system are unreliable
Can attach to single traps or add as an anchor for strings of traps	Tablet/gear box/transducer connections all require separate wires to connect
	Cheaper system doesn't seem reliable
	For the cheaper system, the air tank turns on and continues to release air even after bag is filled
	Doesn't have a controlled ascent rate

## Ashored

Acoustic release Rope on demand system

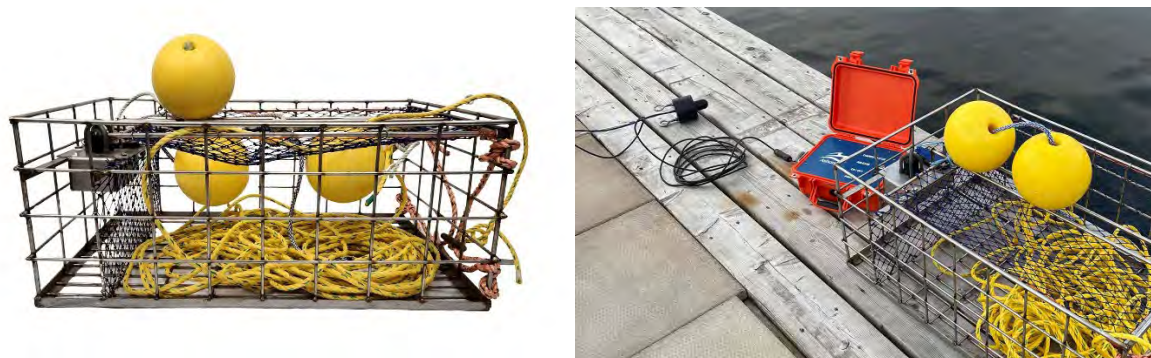
Product specs:

- Entire starter kit (includes 2x MOBI sleds, deck box, over-side transducer, and tablet) \$9500CAD
- MOBI Release Unit and Key Plate \$2000CAD; MOBI with cage and lid \$2500CAD
- Depth rating: 150m
- Battery life: 4-5 months (recharge via anodes in 6-8 hours)
- Two-way communication with range
- Stainless steel



Demo notes:

- Confident in their product, deployed without additional buoy on second deployment
- Easy to use deckbox and tablet app
- Open to fisher feedback to better adapt gear to be more suitable for industry



Left: MOBI system; Right: MOBI system with gear box and over-the-side transducer

Benefits	Limitations
Easy to use, compact deck box (only 2 buttons)	Magnetic key is a bit finnick (but they're adjusting it to make the key float and remove the attached buoy)
Tells range to trap (horizontal + vertical)	Cage comes up last, need to coil rope separately before refitting in system
Shows traps within specified radius	Less practical for single trap use
Backup timer release	
System resets within 1 minute	
ATLAS gear tracking system makes for easy understanding of what gear is deployed, when it was set, range to the transducer, etc.	
Useful for strings of traps (e.g. Mitch lobster)	
Release unit/key can be bought separately to save on shipping costs	
Collects temperature and depth data	