LFA 34

Innovative ‘Whale-Safe’ Fishing Gear Trials for Fixed Gear Fisheries

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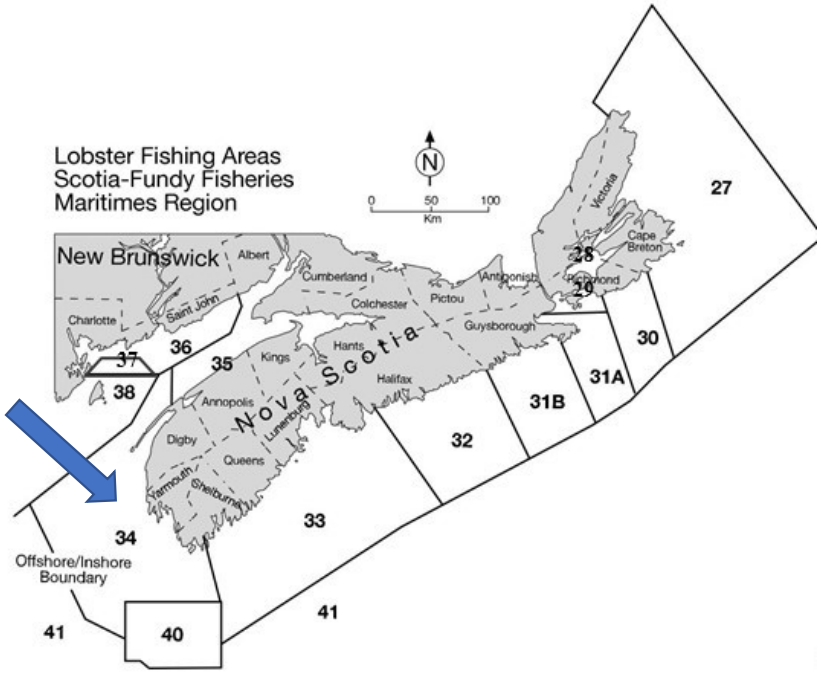
Lobster Fishing Area 34: An Overview



LFA 34 is one of Canada's largest and most productive lobster fishing areas.

The lobster landings in LFA 34 alone account for 40% of the Maritime Region landings and 25% of Canadian landings.

Landings in the last 5 years average approximately 50,000,000 mlbs per season

LFA 34: An Overview

- Number of Lobster licenses in LFA 34: 979
- Season: 6 month duration
  (last Monday in November until May 31st)
- Trap limit: 375
  An additional 25 traps can be set during the Spring months of the season (April and May).
- LFA 34 is home to some of the highest tides in the world, which when combined with a winter fishery, make it a challenging and demanding environment.

Project Overview & Methodology

Every fishery area in Atlantic Canada is different and every Lobster Fishing Area (LFA) and Crab Fishing Area (CFA) present distinct challenges and obstacles:

- **Depths of water fished**;
- **Different bottom types** (flat muddy bottom, hard bottom, ridges);
- **Varying tide strength** [Bay of Fundy - strongest tide/currents in Atlantic Canada];
- **Sea state** can vary considerably (timing/seasonality of fishing activity);
- **Fishing operations** (trawl versus single or doubles);

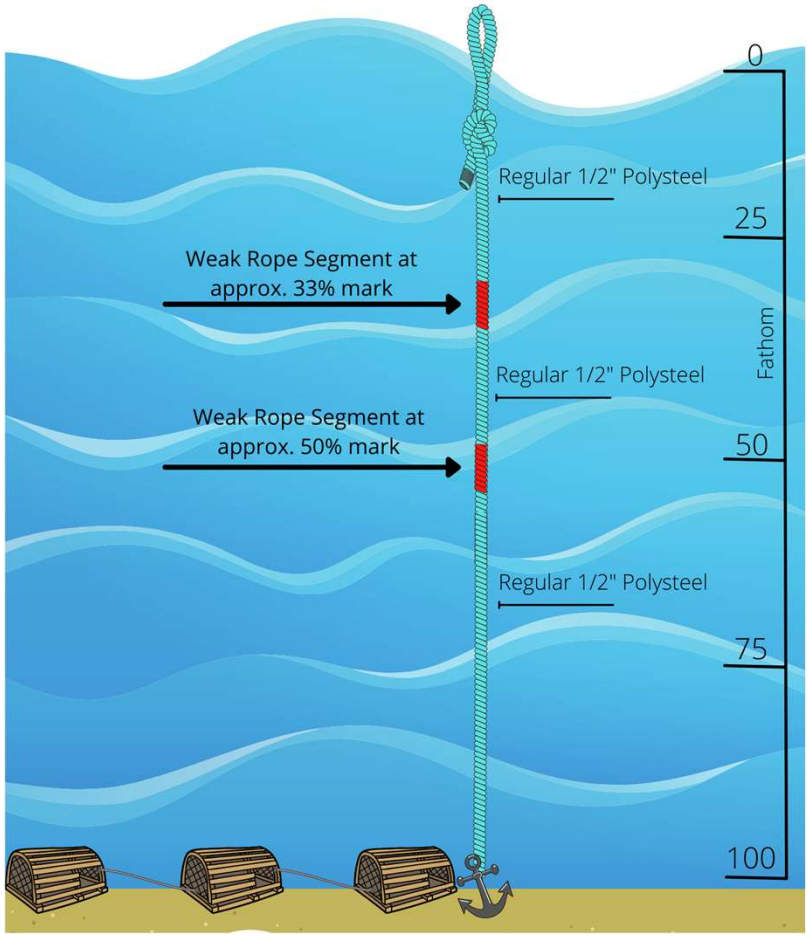
Implementation of any ‘new’ or ‘innovative’ gear type(s) for the commercial inshore fishery must undergo thorough in-season testing to capture the unique / true conditions of that area to accurately assess how these gear types react in actual fishing conditions during the competitive commercial fishery.

Project Overview & Methodology

Lobster Fishing Area 34	Southwestern, Nova Scotia
	Testing sites were selected based on depth, bottom type, tide strength etc. so as to be 'representative' of the fishing district as a whole.
# of Participating Vessels	Six (6) Captains were selected to participate in gear trials based on variables being monitored / assessed.
Time of Testing	Trials were conducted both in-season and out-of-season.
Depth During Trials	Shoal Water Depth: **25 fathom (150 feet)** Deep Water Depth: **132 fathom (792 feet)** Average Depth: **87 fathom (522 feet)**
Other Factors taken into Consideration	• Size of vessel (length and width – larger hulls cover a larger surface area and thus, present additional force/pressure on endlines during swell) • Type of hauler; • Anchor Weight; • Number and size of surface Buoys (strain from tide);

Project Overview & Methodology

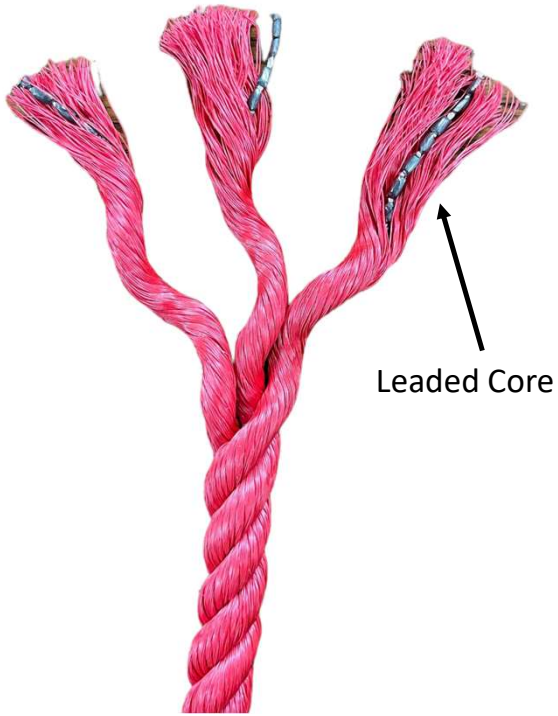
- Several innovative ‘whale-safe’ gear types were tested including low breaking strength rope, weak links, and ‘rope-on-demand’ systems.
- 4 out of 5 trawl had innovative weak components inserted at the top 33% and 50% of the endline. The remaining trawl consisted of the entire top 50% of the Weak Rope V3.
- Each trawl had a test line, as well as a control line for safety/recovery (regular ½” Polysteel). Three captains were equipped with a load reading system, a custom fabricated block and ‘trigger’ camera.
- Third-party tensile strength tests were also conducted to confirm/refute the breaking strength of the gear being tested.
- Third-party engineering firm contracted to provide technical assessment report on gear trial results.



Tufropes Inc.
1-Fathom Segment Weak Rope Version 3

Manufacturer	Tufropes (Enterprise Shippegan)
Manufacturers' Breaking Strength	<1,700lbs
Style	3-Strand
Material	Leaded-core Polyethylene
Colour	Red

PROS	CONS
Easy to splice in to existing rope. Showed 'promise' in performance ***if*** incorporated in 1-fathom segments; longer segments stretched significantly. Most participating captains said they could get a season out of this if necessary.	• Expensive. ~$6.62 per lb. • Significant stretching - almost doubled its length during preliminary tensile strength testing (non-recoverable elongation). • Inconsistent breaking (safety concerns). • Leaded core (environmental concerns). • Very heavy (194 lb coils). • Manufactured outside North America.



Tufropes Inc.
Weak Rope Version 3

Few ‘failures’ when incorporated using 1-fathom segments (inserted at the 33% and 50% marks of the endline). Endlines incorporating Tufropes weal rope for 50% of the endline length parted and/or proved to be unsuccessful for all six captains during trials.

Stretching: 1-fathom (6 feet) segments were observed to stretch up to 30% when inserted at the 50% mark of the endline. This was likely to do with the fact that the segments inserted at the 33% mark would be aboard the vessel before any ‘real’ strain was put on the rope (lifting first anchor, traps, or being caught on bottom).

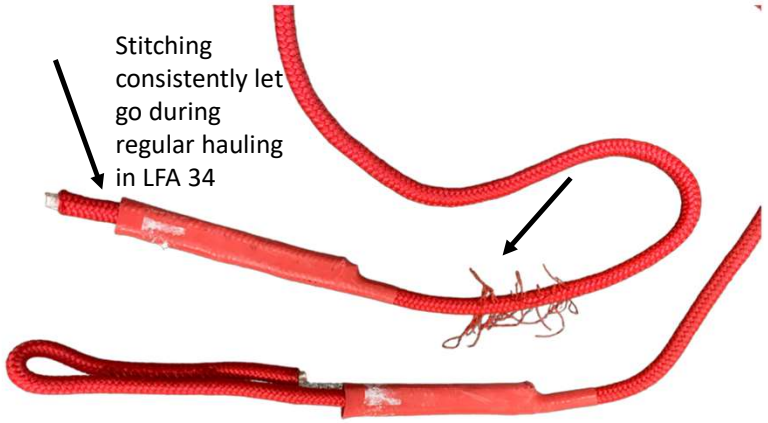
Sediment build up: rope would ‘sink’ and drag along ocean floor due to the weight (leaded core) for endlines that incorporated Tufropes weak rope for 50% of the endline length, compromising the integrity of the rope.

Leaded Core: fragments of lead ‘littered’ the vessel deck (concern of lead entering live well holding tanks and killing catch).

Coastline Cordage
Braided “Break Away Link”

Manufacturer	Coastline Cordage Inc.
Manufacturers’ Breaking Strength	<1,700lbs
Style	Braided
Material	High tenacity polyester / polypropylene
Colour	Red

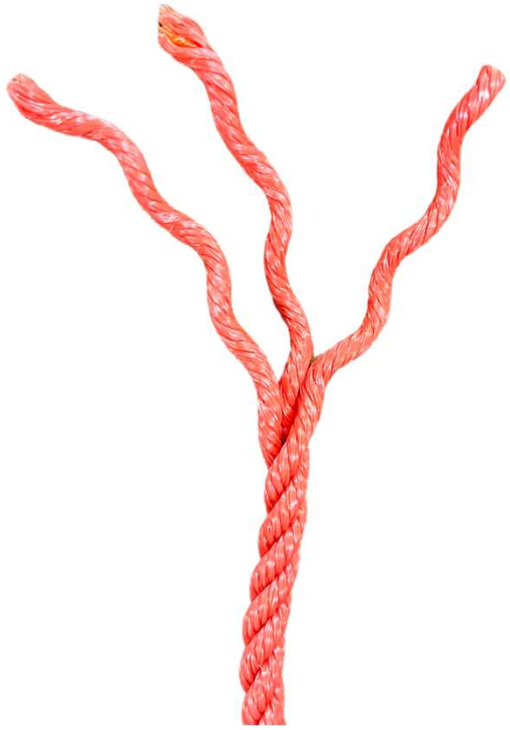
PROS	CONS
Easy to integrate into existing lines. Should break consistently. Comes in various lengths (our tests were conducted with 1 fathom segments).	Mid-range pricing: $38 per unit. This product is a prototype and CLA was the first to test it. Poor performance in LFA 34. Previous version did not allow for ‘spot checks’ on the stitching (heat shrink was not transparent). Unable to handle LFA 34 fishing conditions.



Quintas & Quintas
5/16” Polyethylene

Manufacturer	Quintas & Quintas
Manufacturers’ Breaking Strength	<1,560 lbs
Style	3-strand
Material	Polyethylene
Colour	Orange

PROS	CONS
Easy to integrate into existing lines. Should break consistently. Inexpensive.	Continuous slipping with currently-configured haulers (need to add several spacers). Small diameter makes it difficult to work with.



Quintas & Quintas
5/16” Polyethylene

5/16” rope parted once significant strain was presented (i.e. first trap is pulled off of bottom)

Prone to ‘slipping’ in the hauler, which caused the rope to snap when the hauler was to catch it again.

Small diameter of rope was challenging to work with:

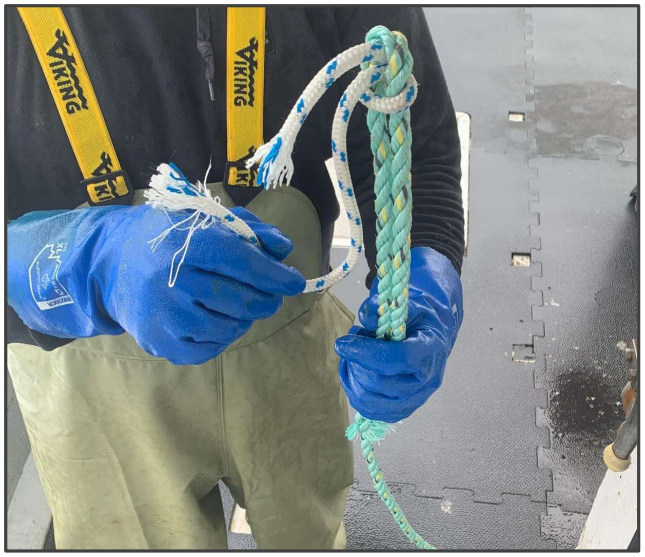
- splicing with different diameter ropes a challenge
- very ‘hard’ and ‘slippery’ due to its material composition and coating, preventing the rope from grabbing onto surface of metal hauler plate.

5/16” rope is not practical for fishing operations in LFA 34 - diameter is not intended for the standard hauler size the majority of fleet currently uses.

Novabraid
‘Stitched Loop/Donut’

Manufacturer	Novabraid Tec.
Manufacturers’ Breaking Strength	<1,700 lbs
Style	Braided
Material	Polypropylene Mix
Colour	White/Blue

PROS	CONS
Easy to integrate into existing lines. Should break consistently. Inexpensive.	Similar to Coastline Cordages’ product. Stitched innovative gear proves difficult to maintain as it’s rated breaking strength relies on all stitches being intact. Unable to handle LFA 34 fishing conditions.



Regular 1/2” Polysteel
Tucks & Splices

Manufacturer	Polysteel Atlantic
Manufacturers’ Breaking Strength	9,600 lbs / <1,700 lbs with tested splice
Style	3-strand
Material	Polypropylene Mix
Colour	Green

PROS	CONS
Already widely used and available. Produced locally. Easy to integrate splices/tucks into existing vertical lines.	Splicing/tucking will vary between captains/crew, making the breaking strength unreliable and inconsistent. Slices / Tucks need to be continuously monitored after each haul due to slipping under strain.

Seaside Inc.
Plastic Inline Link

Manufacturer	Seaside Inc.
Manufacturers' Breaking Strength	<1,700lbs
Style	Plastic Link
Material	Molded plastic
Colour	Black

PROS	CONS
Easy to integrate into existing vertical lines. Comes in a variety of diameters. Relatively inexpensive.	Prone to significant stretching, especially at greater depths, reducing the next hauls chance of success. Unable to handle LFA 34 fishing conditions.

Original Size **33% Mark** **50% Mark**

Stretching after two hauls in deep water

Seaside Inc.
Plastic Inline Link

The SeaSide Inc. Link was prone to significant stretching, particularly at the 50% insert mark of the endline, however stretching did occur at the 33% insert mark as well.

Due to the rigidity and wide profile of this product, it would occasionally break with contact and/or passing through the hauler.

Captains indicated that this product would not work in ‘regular’ fishing conditions in LFA 34 and would lead to gear loss.

Snapping at the Hauler – 2022 (No Audio)

Other Innovative ‘Whale-Safe’ Fishing Gear Tested

Novabraid Tec.
Hollow Braided Sleeves

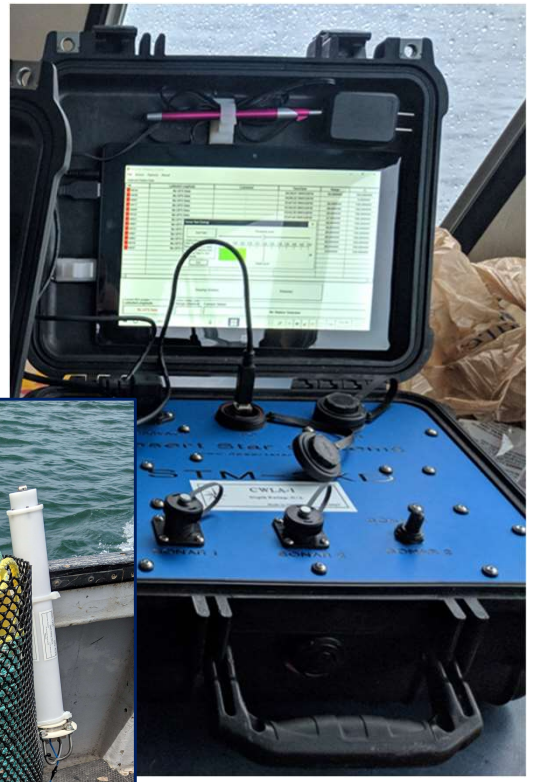
Manufacturer	Novabraid Tec.
Manufacturers' Breaking Strength	<1,700lbs
Style	Hollow Braid
Material	Polypropylene mix
Colour	Orange

PROS	CONS
Inexpensive. Not a challenge for hauler. Easily implemented in current gear setup.	Quick to deteriorate – not capable of handling mild tides. Lost gear inevitable. Tides caused significant twisting of hollow-braided sleeve and this action reduced sleeve length, increasing chaffing and breaking. This product would add to 'lost' gear. Unable to handle LFA 34 fishing conditions.

Desert Star
ARC-10 Ropeless Fishing System

Manufacturer	Desert Star
Manufacturers' Breaking Strength	N/A
Style	Wireless/Ropeless
Material	N/A
Colour	N/A

PROS	CONS
Reduces the vertical lines in the area. Could explore the possibility of using these systems in closures.	Exceptionally expensive – to fully outfit a vessel in LFA 34 is estimated to exceed $100,000 CAD. Unreliable at greater depths, with the possibility of experiencing interference in a busy area. Technologically cumbersome, with system re-set and usage adding several hours to already long fishing days. Acoustic release technology ('ropeless' gear) is NOT a viable option for the commercial lobster fishery in LFA 34.



NON-BUOYANT ('SINKING') GROUND LINE

9/16" Everson Pro

9/16" Polysteel Hydro Pro

9/16" Polysteel Ester Pro

Rainbow Cordsteel Sinking Pro

Annacko

No images available

Everson

Gear Trap/Trawl Description			
# of Trawls Tested:	3 Test Trawl – one endline set as a 'safety' (polysteel) for the first few hauls. 1 Control Trawl – both endlines comprised of 1/2" polysteel		
Traps Per Trawl	15 Traps	**Distance Between Traps**	15 fathom (90 feet)
Trap Description / Gear Configuration	Two-sided 16' x 10" Standard 'American' traps with ballast.		
Groundline / Anchor	Beckets - all 9/16" polysteel. Polysteel used from the last trap to the anchor and 5 fathom past that for the loop. Anchor weight = 85 lbs		

Comments & Observations

- Most 'sinking' groundline tested were challenging to work with.
- Significant sediment build-up noted throughout groundline.
- Gear caught on bottom often causing chaffing and heavy wear – potential for significant gear loss.
- Many, excluding the Hydro Pro generated noise considered "well above the comfortable level" by participants. This also created difficulties communicating between crew members, a significant risk.

THANK YOU

Questions / Comments