

*Whalesafe Gear Adoption Fund Program Report  
on Successes and Failures of Whale Safe Gear  
in LFA 36*



*A Project Completed By:  
Fundy North Fishermen's Association in collaboration with LFA 36 Harvesters*

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# *Whalesafe Gear Adoption Fund Program Report on Successes and Failures of Whale Safe Gear in LFA 36*

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## Introduction

The Whale Safe Gear Adoption Fund Project (WSGF) by Fundy North Fishermen's Association (FNFA) was successful in trialling multiple configurations of gear with a breaking strength of 1700 lbs or less in a variety of the fishing styles that take place in Lobster Fishing Area (LFA) 36. It is an area of extreme conditions in tide and current, and an area that has a lot of variability of gear configuration. This project successfully trialled 6 types of whale safe gear; 4 types of weak or low breaking strength lines, and 2 types of links, across 12 harvesters in the LFA 36 commercial Lobster and Rock Crab fisheries. This project began in 2021 and concluded at the end of the fall 2024 lobster season (Nov. 14, 2023-Jan. 14, 2024). The engineering firm Enginuity was also commissioned to test the breaking strength of various gear configurations (see Appendix B for the full report). While this project is complete, our harvesters continue to use and experiment with different configurations of whale safe gear to aid in their preparedness for any implementation of whale safe gear regulations. The information presented in this report is intended for informational purposes only and should not be construed as professional advice.

## Map of Project Area

Map 1: LFA 36 & 37





# Definition Of Terms

## Seasons:

**Spring 2022:** Refers to Lobster season from March 31, 2022 to June 29, 2022

**Fall 2023:** Refers to Lobster season from November 8, 2022 to January 14, 2023

**Spring 2023:** Refers to Lobster season from March 31, 2023 to June 29, 2023

**Fall 2024:** Refers to Lobster season from November 14, 2023 to January 14, 2024

## Gear Configuration & Rope Type:

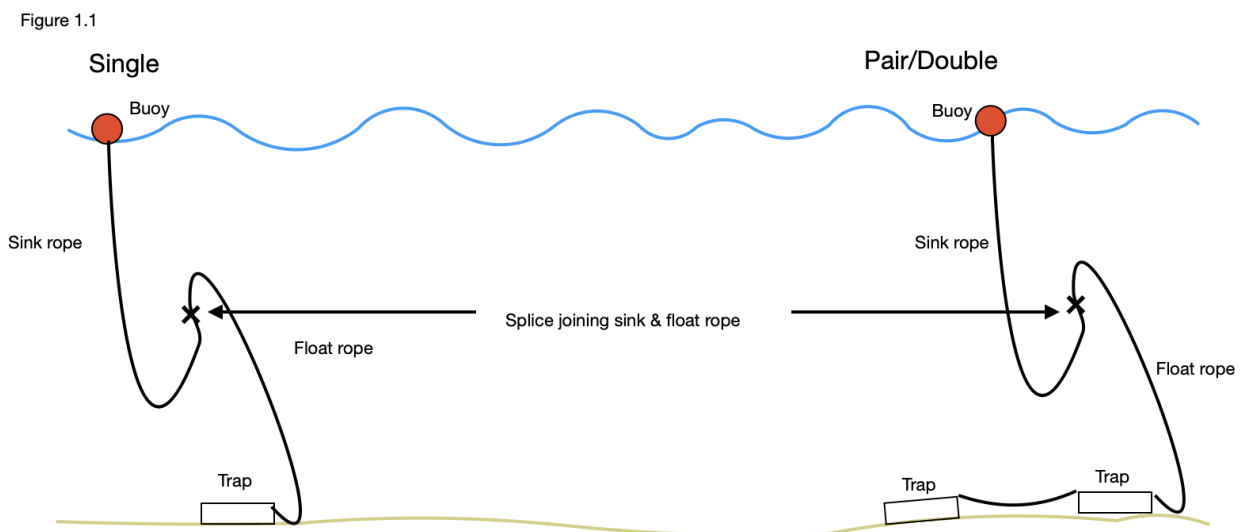
**Endline OR End-line; End line:** Line (rope) running from a buoy at the surface to an anchor or trap on the seabed. Typically endlines are set up with a buoy on the surface followed by a length of sink rope followed by float rope leading to the anchor or trap. Ratio of sink rope to float rope is individual to every harvester and setting conditions.

**Sink Rope:** Rope that is specifically designed to sink below the surface, allowing the rope to remain vertical in the water to avoid getting caught in wildlife or passing boats.

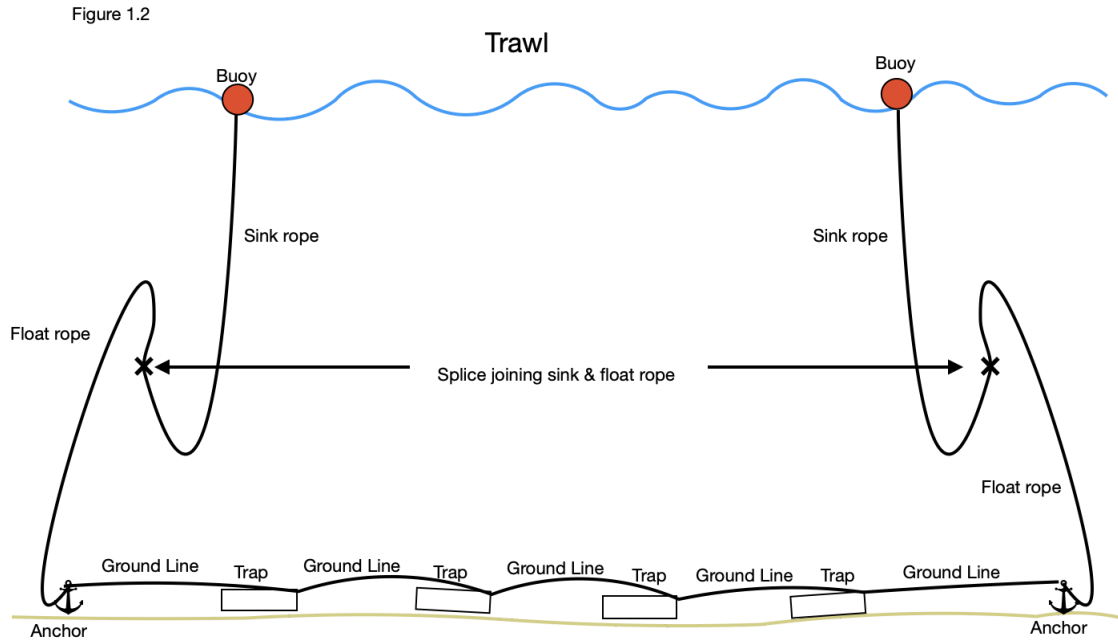
**Float Rope:** Rope that is specifically designed to float, allowing rope to remain off bottom avoiding chafing and getting caught on bottom.

**Singles:** Single trap on a single endline. (See Figure 1.1) For a picture of a trap/rope/buoy ready to be deployed, see Figure 1.3.

**Pairs/doubles:** 2 traps on a single endline. (See Figure 1.1)



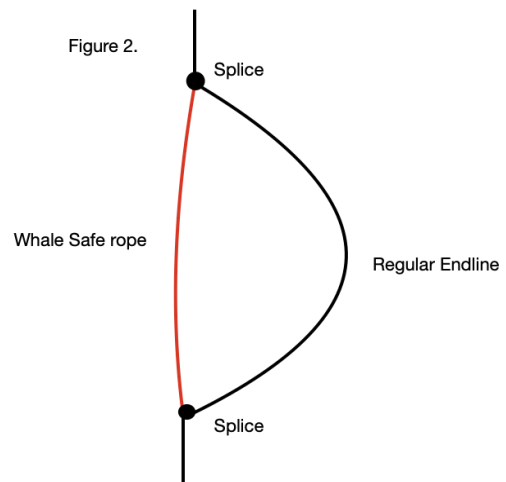
**Trawl:** 4 or more traps spaced out between 2 endlines (one at each end), trawls usually have anchors at the bottom of the endline before the first trap to ensure it remains where it was set. (See Figure 1.2)



**Slack Trawl:** A trawl with no anchors.

**Safety Loop:** Refers to splicing a line (in this case whale safe line) into the endline shortening it slightly making a loop in the endline acting as a safety. When strain is placed on spliced in line (whale safe) if it breaks the stronger endline is still present preventing lost gear. (See figure 2)

Figure 1.3: Single trap ready for use



**Buoy:** A flotation device for the end of a line. These can vary in materials (i.e. foam, ‘balloons’ of air, etc.) and size. In LFA 36 they are expected to be underwater due to the tide currents and depth for portions of each day. They can also be affected by pressure. (see Figure 3)



Figure 3: In white and red, some new large buoys. In green below them, the same buoy type after being snarled on the bottom, and crushed by water pressure.

## Tide and Depth

**High Tide:** The point when the tide/water level is at its highest point in the tidal cycle.

**Low Tide:** The point when the tide/water level is at its lowest point in the tidal cycle.

**Slack tide:** The point when the tidal flow is changing from getting higher to getting lower and vice versa, this point is when the current is the weakest. Approximately 2 hours before and 2 hours after cycle change.

**Fathom (ftm):** a measure of depth or line. 6 feet or 1.82 metres, traditionally used as harvesters use their approximate 6 foot arm span to measure rope.

## Miscellaneous terms

**Haul:** Refers to when the harvester hauls the trap aboard the vessel to check gear, empty trap, and replace bait.

**Hauler OR Trap Hauler:** Refers to the hydraulic equipment used to haul the rope and traps on board the fishing vessel.

**Snarl:** Traps and rope tangled together on the bottom, often made worse by a ‘tumbleweed’ effect created by the tide. This can be a few traps pushed together and entangled, or enormous tangles of ghost gear. If a trap or line is caught in a snarl, significant weight is added to the line, which can cause the lines to break. (See Figure 4)



Figure 4: A large snarl of ropes and traps. Photo used with permission from the Fundy North Ghost Gear Retrieval Project.

**Splice:** Refers to untwisting rope or cable and methodically tucking the individual strands either back into itself to make a loop or into another rope to join multiple ropes together. The ends of the individual strands are either melted or wrapped in tape to avoid fraying while splicing. (See Figure 5)



Figure 5: Examples of splices between two ropes



## Description Of Whale Safe Gear Trialled

This project focused on finding cost effective solutions by trialling Whale Safe rope and links that are commercially available. While additional options were examined with harvesters, the products listed here were trialled and tested. This list includes the colloquial names used by our participants and this report, as well as detailed information on each product, and select pictures of gear configurations.

**Candy Cane:** Low Tensile Marine Rope Candy Cane.  $\frac{3}{8}$ " , 1700 Pound Breaking Strength, from Ketcham Supply<sup>1</sup>. (see Figure 6.1 for an example rope configuration)

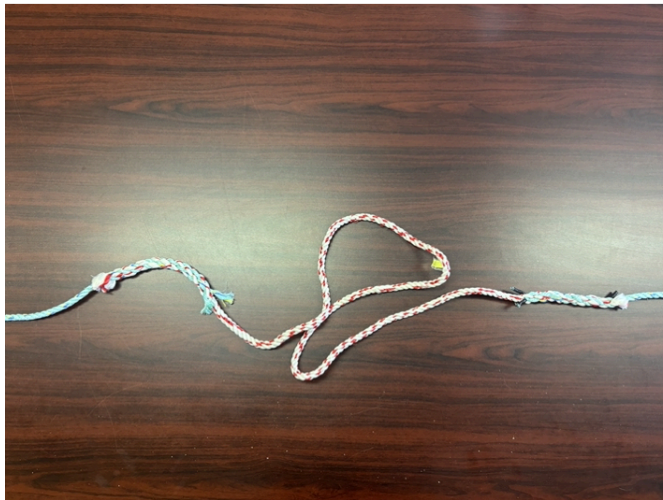


Figure 6.1: Candy Cane (CC) rope configuration example

**Brooks/Plante Links:** Two types of plastic link, used interchangeably. **1)** 1700# Breakaway Links. Black Nylon from Plante's Lobster Vents. **2)** 1700 ILB Breakaway 'Maine Mold' Links from Brooks Trap Mill. (See Figure 6.2 for rope configuration)



Figure 6.2: Plastic links between two lines. Plante link on left, Brooks link on right.

<sup>1</sup> For more information, see the Ketcham website at: <https://ketchamsupply.com/product/low-tensile-marine-rope/>

**Coastline:** Break away Release link. 7/16th diameter from Coastline Cordage Group. Patent #: PCT/CA2022/050329<sup>2</sup>. (See Figure 6.3 for rope configuration)



Figure 6.3: Coastline rope configuration

**Novabraid:** SSL 2.0 Breakaway Link, from Novabraid Performance by Design<sup>3</sup>. This is made with a hollow core, and the regular commercial rope is inserted inside the Novabraid link. (See Figure 6.4 for rope configuration)



Figure 6.4: Novabraid configuration. The tan rope is inserted into the orange Novabraid.

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<sup>2</sup> For more information, see the Coastline website at: <https://break-away.ca/>

<sup>3</sup> For more information, see the Novabraid website at: <https://www.novabraid.com/rope/ssl-2-0-breakaway-link/>

**Shippagan:**  $\frac{3}{8}$ " leaded weak red rope, Item number 70618149 from Entreprises Shippagan Ltd (See Figure 6.5 for an example rope configuration)



Figure 6.5: Shippagan configuration, spliced to float rope.

**Everson:**  $\frac{3}{8}$ " Medium Lay Whale Safe Rope from Everson Cordage Works. This was purchased in 2023, and was not available to as many harvesters during the study period. (See Figure 6.6)



Figure 6.6: Everson rope

## Description Of Participants And Variables

Our participants covered a wide range of geography, covering the entirety of LFA 36 from the St. Croix River as far up as St. Martins harbour, NB. The majority of our participants trialed their gear during the Lobster fishery, however we did have 1 participant trial gear during the Rock Crab fishery throughout the project. Covering the two different fisheries and large geographical area, we were able to trial whale safe gear in a variety of situations and environments such as; large tide fluctuations, strong tidal rips, deep water, shallow water, different bottom types, shipping lanes, trawl, single, and pair gear configurations. This allowed us to test to the best of our ability the feasibility of a trap fishery with the use of weak line and/or weak link whale safe gear in our area. Please note that LFA 36 has incredibly diverse fishing conditions, and therefore these results cannot be taken as representative of the entirety of LFA 36.



Participant 1	Participant 2	Participant 3
<p>Participant 1 (P1) harvests crab using singles, doubles, and trawls. Generally, P1 is harvesting in 10 to 45 fathoms of water, with one shipping lane and some strong currents. The sea bed is mostly mud so when a trap drags and fills with mud, additional weight is to be expected. In general, P1 would use twice as many fathoms of line as fathoms of water, and would divide their line between sink and float rope as follows: 20 ftm or 30 ftm line is half sink rope, half float rope, 40 ftm of line is 15 ftm sink rope, 25 ftm float rope; 50 ftm line is 20 ftm sink rope and 30 ftm float rope, etc. This is designed to prevent recreational ship traffic from cutting lines on the surface. When there is more traffic, it is crucial to have enough sink rope at the surface. P1's lines usually last up to eight years of use.</p>	<p>Participant 2 (P2) harvests lobster using singles. Generally, P2 is harvesting in 20 to 45 fathoms of water, with strong tides. In general, P2 would use a line that is 5 fms longer than the depth of the water, and would divide their line between sink and float rope as follows: 15 ftm is 10 ftm float rope, 5 ftm sink rope, 20 ftm line is 10 ftm sink rope and 10 ftm float rope, 30 ftm line is 20 ftm float rope, 10 ftm sink rope, 40 ftm line is 30 ftm float rope, 10 ftm sink rope. P2 uses different sizes of buoys for different lengths of line. P2's lines usually last 3-4 years, though the lines may be repurposed after that (ie 40 ftm lines cut into 15 ftm lines).</p>	<p>Participant 3 (P3) harvests lobster using singles, and pairs. Generally, P3 is harvesting in 9-50 fathoms of water, with very strong tides and currents. This requires more weight in the traps than in other locations, and additional weights added for the strongest tides. P3 would determine the length of rope by both the current and depth, but generally, 9 ftm of water is 10 ftm line; 12 ftm of water is 15 ftm line; 20 ftm water is 30 ftm line; 30 ftm water is 40 ftm; 50 ftm water is 65 ftm line. P3 would divide their line between sink and float rope as three times the float rope as sink rope, for example: 10 ftm line is 4 ftm sink rope, 6 ftm float rope or half sink and half float rope; 15 ftm line is 6 ftm sink rope, 9 ftm float rope, and 20 ftm line is 8 ftm sink rope, 12 ftm float rope; 30 ftm line is 12 ftm sink rope, 18 ftm float rope; 65 ftm line is 20 ftm sink rope, 45 ftm float rope. Typically, P3's lines would last approximately 1-5 years using lines only one season out of the year and storing them indoors, however P3 notes that there is a wide range of longevity depending on use and type of rope.</p>

Participant 4	Participant 5	Participant 6
<p>Participant 4 (P4) harvests lobster using singles. Generally, P4 harvests between 5-30 ftm. In general, P4 would use a line that is 5 ftms longer than the depth of the water, and would divide their line between sink and float rope as 40% sink rope, 60% float rope, for example: 15 ftm is 9 ftm float rope, 6 ftm sink rope, 20 ftm line is 8 ftm sink rope and 12 ftm float rope, 30 ftm line is 18 ftm float rope, 12 ftm sink rope, 40 ftm line is 14/16. 30 ftm float rope, 10 ftm sink rope. P4 uses different buoy sizes for different lengths of line. P4's lines typically last up to 4-5 years.</p>	<p>Participant 5 (P5) harvests lobster using 12-30 trap trawls, depending on the season. Generally, P5 is harvesting in 25-80 fathoms of water with a shipping lane, and strong tides. In general, P5 would use a 45ftm line in 25 ftm water, an 80 ftm line in 50 ftm water, and a 125 ftm line in 80 ftm of water, and would divide their line between sink and float rope as follows: 45 ftm line is 15 ftm sink rope, 30 ftm float rope; 80 ftm. line is 20 ftm sink rope, 60 ftm float rope; 125 ftm line is 25-30 ftm sink rope, 95-100 ftm float rope. P5's lines usually last approximately 3 years (lines typically only used in spring or fall, not both).</p>	<p>Participant 6 (P6) harvests lobster with 15 trap trawls. Generally, P6 is harvesting in 34-50 fathoms of water, with busy shipping lanes during the Fall season. In general, P6 uses 100 ftm endlines, comprised of 3 types of rope. Under the buoy, there is 30 ftm of 5/16th diameter rope, starting with 10 ftm of sink line, then 20 ftm of float rope. This line is then spliced to the stronger 3/8ths diameter float rope for the remaining 70 ftm (128 m). The trawl has 60 lb. anchors on each end. As a result, if a vessel is caught in the line/buoy, the endline near the top will break, leaving the trawl on its mark. P6 is then able to grapple to retrieve the trawl as it stays in its original location, ensuring it can be grappled for (multiple traps, and lengths of rope). P6 would expect the sink lines to last around 5 years. P6 also monitors and cares for his lines (for example, cutting out a damaged section and splicing it back together), thus extending its life. P6 reports that the first weaker rope needs to be handled gently to prevent breaking, then once the 3/8ths rope is in the hauler it can take the weight more easily.</p>

Participant 7	Participant 8	Participant 9
<p>Participant 7 (P7) harvests lobster with 30 trap trawls. Generally, P7 is harvesting in 50-80 fathoms of water, with busy shipping lanes, ferry routes, and strong tide currents. In general, P7 uses 1.5 times as much line as depth of water. P7 would divide their endlines between sink and float rope as 20-25 fathom sink rope, and the remaining as float rope. P7 would expect the lines to last approximately 5-6 years.</p>	<p>Participant 8 (P8) harvests lobster using singles and doubles. Generally, P8 is harvesting in 2-85 fathoms of water, in the Head Harbour area, with tides of 4-5 knots, large snarls, and very uneven bottom. P8 has indicated that the line configuration is often determined from where the trap could go (i.e. off a ledge) and the current, rather than from a single depth reading. P8 notes that the line regularly snarls with other gear, so it is typical to lift 10-15 traps, up to as many as 30 traps with only two buoys showing at the surface. P8 also uses the largest buoy sizes available due to the tide. In general, P8 would use 100-110 ftm line in 85 ftm water; 90 ftm in 65 ftm water; 80 ftm line in 50 ftm water; 70 ftm line in 40-45 ftm water; 60-50 ftm line in 40 ftm water; 40 ftm line in 25 ftm water; 20 ftm line in 10-15 ftm water; 12 ftm line for 2-8 ftm water. Any line 70 ftm or longer would use 2 of the largest buoy sizes. P8 divides their line between sink and float rope generally as 25% sink rope, 75% float rope. For example, 100-70 ftm line is 20 ftm sink rope, and the remainder float rope; 12 ftm line is 5 ftm sink rope, 7 ftm float rope. P8 uses 3/8 inch rope, with 7/16th inch rope between pairs. Typically, P8 would expect lines to be used for 3-4 years.</p>	<p>Participant 9 (P9) harvests lobster with singles, doubles. Generally, P9 is harvesting in 5-55 fathoms (9-100 metres) of water. In general, P9 uses 1.5 times the line to the water depth, for example, 50 ftm line in 35 ftm water, and would divide their sink and float rope as 33% sink rope, 66% float rope, for example: 20 ftm line is 6 ftm sink rope, 14 float rope. P9 would expect lines to last approximately 7-8 years, with the exception of lines from Rainbow, which P9 would expect to last 4 years.</p>

<b>Participant 10</b>	<b>Participant 11</b>	<b>Participant 12</b>
<p>Participant 10 (P10) harvests lobster using singles, doubles, and trawls. Generally, P10 is harvesting in 5-60 fathoms of water, with significant tide, and lots of aquaculture vessel traffic. In general, P10 would use approximately 1.5 times the amount of rope as water, so 50 ftm of line in 30 ftm water. P10 would divide their line between sink and float rope as follows: 15 ftm line is 5 ftm sink rope, 10 ftm float rope; 25 ftm line is 8 sink rope, 17 float rope; 50 ftm line is 15 ftm sink rope, 35 ftm float rope; 80 ftm line is 20 ftm sink rope, 60 ftm float rope; 100 ftm line is 25 sink rope, 85 float rope. P10's lines would generally last 3-4 years, changed after P10 sees any ware.</p>	<p>Participant 11 (P11) harvests lobster with singles. Generally, P11 harvests in 15-30 fms of water, with strong currents. Generally, P11 would use approximately twice as much line as water, and would divide their line between sink and float rope as follows: 20-30 ftm line is 8 ftm sink rope, the rest float rope; 40-55 ftm line would be 12 ftm sink rope, and the rest float rope. P 11 would expect a line to last 8-10 years.</p>	<p>Participant 12 (P12) harvests lobster using singles in the spring season, and trawls in the fall season. Generally, P12 is harvesting in 5-45 fathoms of water with very strong tide, ledges and shallow rocks that can cause things to become caught on the bottom in the. In general, P12 would use three times the amount of line as water, to accommodate the tide holding the line down. P12 uses all float rope. P12's lines usually last up to 5 years on trawls, and 10 years on single traps.</p>

# Results

All 12 participants were provided the opportunity to trial all the different equipment, with the exception of the Everson rope, because the Everson rope became available at the end of the study period and results were therefore dependent on participants’ ability to add lines midseason.

Please note that participants retained a choice in what equipment they tested, and how it was used. Participants choosing not to trial a specific type of equipment is therefore closely linked with their confidence in their ability to use the equipment without losing their traps and regular line. **Therefore, an N/A in these results is indicating that the participant chose not to use the equipment, despite access to materials** (except in the case of Everson, as noted above).

Failures are defined as participants needing to halt testing, due to the gear failing or showing obvious signs of failure, or the gear being lost. Please refer to Appendix A for how each participant set up their testing lines. The chart below shows their results and observations only.

## Candy Cane

Candy Cane	Observations	Results
Participant 1	In general, P1 found the CC rope frayed quickly with use. It did not splice well as it was loose and would start to come apart. Singles: After 3 seasons, anything that is still in use is very frayed, and somewhat untwisted. The main issue is that it stretches significantly. It did not part/break because it stretched until the weight was on the regular (safety) line. Trawls: no safety in the splice because the other endline acts as a safety. These lines are not hauled as often (1/2 on the other endline). There is also not too much weight on the line because the candy cane rope is through the hauler before all the trap weight is pulling on the rope. The trawl with 7 fms of CC was used for one full crab season, and is quite frayed, but still usable.	Failed
Participant 2	P2 reported that the CC frayed badly, came apart, and even became splintery. The CC did not part/break through the 2022 Spring season, because as it stretched out the good rope would take the strain. It didn’t break because of the safety, but failed to perform as needed.	Failed
Participant 3	P3 still uses some, most have knotted up and stretched too much. Also does not splice well, due to the very soft lay. CC was generally better when used in very shallow water.	Failed

<b>Candy Cane</b>	<b>Observations</b>	<b>Results</b>
Participant 4	CC spliced into the line: P4 reported significant chafing and fraying. After only 3-4 weeks, (approximately 20 hauls), P4 had to replace the spliced section. CC as sink rope: P4 reported that the CC line twisted badly, even with a swivel. P4 was forced to replace the line after only 3 hauls.	Failed
Participant 5	N/A	N/A
Participant 6	N/A	N/A
Participant 7	P7 reports that the CC came unravelled easily, and that the spliced pieces would come undone. P7 had to replace all of the lines after 1-2 weeks, after 2 different end lines came apart in the water. In each case, when P7 hauled the gear from the regular endline, the CC splice had come apart, and P7 lost some of the line and the buoy.	Failed
Participant 8	P8 reported that the CC line would part/break if there were extra traps on the line or the trap was snagged on the bottom. Additionally, P8 noted that the CC line was too soft to properly hold a splice. Lastly, P8 reported that after only a few hauls, the CC line had also stretched enough that the strain was on the safety line.	Failed
Participant 9	CC as the full line: P9 reported that the CC chafed significantly, and could only be hauled 6-7 times before the line had to be replaced. CC spliced in: P9 reported that the CC splice stretched quickly, resulting in the safety line taking the strain. P9 noted that the loop would chafe significantly, even when the strain of the load was on the regular line, so that the CC splice had to be removed after only a few hauls. Additionally, P9 had concerns about how the CC line did not hold a splice as well as a regular line.	Failed
Participant 10	N/A	N/A
Participant 11	P11 found that the CC frayed after only a few hauls. P11 did a big enough loop, one stretched until it parted (broke), the rest they cut out after 8-10 hauls because of how frayed and messed up it was. It was also a bit hard to get the loop through the hauler. Splicing it didn't matter as much because it didn't burn well. P11 burns the strands as they splice so it stays together.	Failed

<b>Candy Cane</b>	<b>Observations</b>	<b>Results</b>
Participant 12	P12 reported that the CC line unravelled, and each strand unravelled until it resembled a mouse nest. To maintain integrity, the ends of the rope are typically melted slightly to prevent unravelling when cut. P12 reported that the CC line would not melt easily for splicing. Additionally, P12 reported that the CC line did not pass through the hauler smoothly. After 5-6 hauls, the CC line had to be discarded.	Failed

### **Brookes & Plante Links**

<b>Brookes &amp; Plante Links (Plastic Links)</b>	<b>Observations</b>	<b>Results</b>
Participant 1	P1 found the links passed through the hauler well. Still using, no signs of wear.	No Failure
Participant 2	P2 had no issues saying you get used to the sound of them going through the hauler. P2 still has 4 still on after the Fall 2023 season.	No Failure
Participant 3	P3 tested only in shallow water, but the links worked well in those conditions.	No Failure
Participant 4	P4 reported no issues, and noted that the link passed through the hauler well.	No Failure
Participant 5	P5 did not have many issues with the links. They occasionally jumped out of the hauler, making it necessary to slow down the hauler for a few moments. These 'jerk' as they jumped out could be a safety concern for crew working close by, especially if there is extra strain on the line. P5 lost a few lines, but believes that to be due to ship traffic rather than the links.	Lost, No Failure
Participant 6	N/A	N/A
Participant 7	P7 reported no issues, and notes that the links passed through the hauler well.	No Failure
Participant 8	P8 did not find any issues	No Failure

<b>Brookes &amp; Plante Links (Plastic Links)</b>	<b>Observations</b>	<b>Results</b>
Participant 9	P9 reported no issues	No Failure
Participant 10	N/A	N/A
Participant 11	P11 reported that the links performed well, and went through the hauler without issue.	No Failure
Participant 12	<p>Spring 2022 Season: P12 reported no issues, and removed gear from his lines after the season was over.</p> <p>Fall 2022 Season: P12 tested the strength of one link by tethering it to the wharf and pulling it with a hauler. The 7/16 inch line P12 used broke before the link. P12 had to use a 1/2 inch line to break the link.</p> <p>Fall 2023 Season: One link was left on the line, and P12 used it through the season. The link stretched out, but didn't break.</p>	No Failure

## Coastline

<b>Coastline</b>	<b>Observations</b>	<b>Results</b>
Participant 1	As of the fall 2023 season P1 is still using the line, and functioning well. Has a tendency to jump out of the hauler, which is a safety concern.	No Failure, but has safety concerns.
Participant 2	N/A	N/A
Participant 3	P3 did not see any structural issues over 3 seasons. The stitching is still strong, though the rubber cover has worn off significantly	
Participant 4	P4 expressed concern that there was not any clear way to see wear or issues before it breaks. P4 saw one coastline begin to come apart in May 2023, and took all of the lines off to prevent losing gear. Additionally, P4 noted concerns about the price of the product.	Failed
Participant 5	N/A	N/A
Participant 6	N/A	N/A



<b>Coastline</b>	<b>Observations</b>	<b>Results</b>
Participant 7	N/A	N/A
Participant 8	N/A	N/A
Participant 9	P9 reported no issues in the initial season (fall, 2023). However, P9 reported that one month into the spring 2023 season, the coastline failed with no warning. P9 was able to haul the line almost to the splice between float and sink rope before the line broke and the trap was lost.	Failed
Participant 10	N/A	N/A
Participant 11	N/A	N/A
Participant 12	N/A	N/A

## **Novabraid**

<b>Novabraid</b>	<b>Observations</b>	<b>Results</b>
Participant 1	P1 observed that one line came out on the first haul. The other 2 lines failed within 3-4 hauls. Had a specialist try to help ensure they were set up as intended, and they still couldn't hold.	Failed
Participant 2	N/A	N/A
Participant 3	P3 lost these traps several times, but was able to retrieve them and continue trialling due to the shallow water. The Novabraid gear is only designed to work when the strain direction is predictable, so if the trap or line are tangled in anything else, the finger trap slides off. P3 retains one Novabraid line, that he sometimes uses in very shallow clear water, with the expectation that he will need to grapple the trap to retrieve it after the equipment fails.	Failed
Participant 4	P4 cut the Novabraid to allow for splicing and it frayed badly. As a result, P4 had to replace the Novabraid.	Failed
Participant 5	N/A	N/A

<b>Novabraid</b>	<b>Observations</b>	<b>Results</b>
Participant 6	N/A	N/A
Participant 7	N/A	N/A
Participant 8	N/A	N/A
Participant 9	N/A	N/A
Participant 10	N/A	N/A
Participant 11	N/A	N/A
Participant 12	N/A	N/A

## **Shippagan**

<b>Shippagan</b>	<b>Observations</b>	<b>Results</b>
Participant 1	P1 found the Shippagan rope seemed good for splicing, wear, etc. Also used with the spring loaded ropeless gear they are testing for Canadian Whale Institute, worked well.	No Failure
Participant 2	P2 found 10ftm of this rope was very heavy. Had to adjust the type of buoy used, regular buoy would go under. Could cause loss of a trap.	Did not fail but not satisfactory
Participant 3	N/A	N/A
Participant 4	P4 reported no issues, and is still using the Shippagan lines	No Failure
Participant 5	P5 had success with using Shippagan as sink rope in shipping lanes, as vessels did not get caught in them. However, the buoys would struggle with the weight of the rope. If there was a big tide, P5 would have to wait for slack tide to access the lines.	No Failure
Participant 6	P6 does not report any issues. P6 has used this rope before in regular use, and what he put on is still in use. P6 notes that with weaker rope at the top of the line, care has to be used until the stronger 3/8ths rope is in the hauler. This does take additional time.	No Failure

<b>Shippagan</b>	<b>Observations</b>	<b>Results</b>
Participant 7	P7 reported no issues, and noted that the Shippagan as sink rope worked particularly well due to the speed that the rope sank.	No Failure
Participant 8	P8 noted that extra effort was needed to splice the Shippagan rope, since this rope needed 5 tucks per strand instead of 4 tucks per strand in order to hold. P8 did not have any failures, but did not trust the Shippagan line to do heavier work, and so did not trial it in the most extreme conditions (i.e. close to known snarls that would add a lot of additional weight to the line). Spring 2023 Season: P8 used less of the Shippagan rope, because the lines set up for testing were not all needed for the season. Fall 2023 Season: P8 reported that none of the lines had parted, or showed excessive signs of wear.	Did not fail but not satisfactory
Participant 9	P9 reported no issues	Did not fail
Participant 10	P10 found that the Shippagan spliced well but would come untwisted easily. P10 typically uses medium lay, this is soft lay. P10 therefore avoided areas where snarls are common, as the untwisted rope is weaker. Additionally, P10 noted that the size of the rope held the tide significantly and would pull a typical buoy under. Usually P10 uses 11/32” rope so that it doesn’t take long to come up if the tide pulls the buoy under. The Shippagan line would stay down an extra 5-10 minutes, so P10 could miss the gear and have moved on to the next spot before the buoy came up. This is especially problematic because harvesters need to keep moving to get to the next trap/trawl before the tide starts coming back up in areas with lots of tide. P10 has to plan to haul his gear at specific points of tide in order to retrieve his lines. Using the Shippagan often added time while P10 searched for gear. Lastly, P10 noted some extra chaffing on some of the Shippagan lines compared to what would be expected on a normal sink rope.	Did not fail, but not satisfactory
Participant 11	P11 reported no issues, noting that the Shippagan line acted as regular rope.	No Failure
Participant 12	P12 reported no issues, and removed gear from his lines after each season was over.	No Failure

## Everson

<b>Everson</b>	<b>Observations</b>	<b>Results</b>
Participant 3	P3 reported no issues	No Failure
Participant 4	P4 was able to trial the everson rope for 2 weeks before conditions changed. During that time, P4 reported that the Everson rope performed well, however by Spring 2024 the tracers had faded significantly. It is unclear if this was due to its use during the season, or being stored outdoors.	No Failure, but tracers faded
Participant 9	P9 reported no issues, but highlighted that it was a short trial since P9 began using the Everson near the end of the season.	No Failure

## Harvester Comments & Concerns

Participant	Comments or Concerns
Participant 1	P1 is concerned with creating more ghost gear from deliberately weak rope. Boat traffic will break more lines, creating more ghost gear in the area. That will cause problems for the whole ecosystem. Price and availability of required materials are the biggest practical issues for harvesters.
Participant 2	P2 is concerned about the cost for harvesters, as the rope is very expensive and can be cost-prohibitive. Additionally, having any regulations well in advance of implementation is vital, as harvesters would have to remake up to 900 lines. This is because harvesters prepare lines for different places and depths in advance, and change out lines as needed to move traps day to day during the season.
Participant 3	P3 is concerned about extra time and effort preparing ropes and splicing lines, as there is already a significant amount of time spent on preparation and repair. P3 is concerned that older harvesters will have a hard time adjusting. Additionally, P3 noted the variety of different fishing conditions and typical setups across our LFA, highlighting that any general rule will negatively affect at least some of our harvesters.
Participant 4	P4 is concerned about the effort, time, and cost of making all the lines Whale Safe when there is no decision allowing its use during whale closures. P4 is especially concerned about the cost of the products, but also noted that safety should always be considered during any changes.
Participant 5	P5 is concerned about the financial burden this additional material could place on harvesters, especially since P5 already observes colleagues reusing and fixing materials rather than buying new due to cost. In addition, P5 noted that harvesters would need lots of warning for any changes, given that many people prepare their gear months in advance of the season. From a safety perspective, P5 wants to highlight the very real danger presented by gear jumping out of the hauler. If the line jumps out, it can go over a crew member, causing injury and potentially pulling them overboard. P5 has seen a line jump out before, which is why everyone uses splicing rather than other ways of connecting lines. P5 is therefore very hesitant to add a link of any kind.
Participant 6	P6 notes that with weaker gear it is vital to handle the hauling with care to prevent the line breaking. With this gear, you have to be careful hauling to avoid extra strain on smaller lines. Might slow some folks down. Need at least 2 seasons of lead time/notice before regulation changes. Need to give them time because it will cost a lot of money. Not a big fan of links and special weak pieces that could break in the hauler, fly out, hit things. Not safe.

<b>Participant</b>	<b>Comments or Concerns</b>
Participant 7	P7 is concerned about access for supplies if the change is mandated. P7 noted that a harvester using single gear would need to equip 300 lines, which would be a significant financial burden and could cause supply issues.
Participant 8	P8 is concerned about an increase in Ghost Gear due to the weak lines and links breaking more often, especially when interacting with extreme tides, currents, or snarls. P8 is worried about the effects on the environment and fishing areas if more ghost gear becomes the norm, not just on whales, but on the whole ecosystem. Additionally, P8 notes that implementing whale safe gear will add a large financial burden to harvesters, from buying the new equipment and also replacing more lost traps as lines and links give way. P8 is also concerned about the extra time required to replace or repair the lines more often, since in his case, this would change from approx. 400 lines being replaced every 3-4 years, to every calendar year if the lines were whale safe. P8 would also like to note that the weak rope or link is used part way through the line, which means if the line is long enough, the weak portion is through the hauler before the majority of the weight is on the rope. P8 is concerned that longer lines than typically necessary will be used in order to avoid putting all of the weight on the weak link or rope.
Participant 9	P9 is concerned about the financial burden this would place on harvesters, especially with catches becoming less consistent season to season. P9 believes any mandatory use of Whale Safe Rope should be subsidised, especially because the cost would make individual Owner Operators struggle, and create another advantage for large companies. Additionally, P9 believes that the Whale Safe Rope is not the best solution for protecting whales in our area, especially with so few whale entanglements reported with rope from our area.
Participant 10	P10 notes that any good quality product will cost, and adding additional products required will create a large financial burden for harvesters. P10 believes that the fishing industry needs to be consulted before any policy change if it is to function on a practical day-to-day level for the industry. P10 would also like to highlight that the harvesters will need significant warning to make any changes. Lastly, P10 believes that using weak rope and/or links without thorough testing will result in more ghost gear, which P10 believes will cause harm to whales and other marine life more than it will benefit them.
Participant 11	P11 is concerned about the harvester's perception of Whale Safe Gear, recommending education in advance of any changes. P11 believes that changes are difficult for harvesters, for example needing to add colours to the lines was a large shift, but now it is normal. P11 believes that if the links were to be used, the cost may not be as much of an issue as some believe, since they seem to last and are not as expensive individually.

<b>Participant</b>	<b>Comments or Concerns</b>
Participant 12	<p>P12 noted that harvesters would need significant amounts of time to convert gear. P12 uses all singles in the spring, and prepares approximately 600 lines in advance of the season. Adding two extra splices to each line to put in a piece of whale safe rope or link adds 1200 splices that have to be done by hand, monitored, and repaired if needed. P12 estimates that harvesters would need at least a full year of warning to accommodate any changes. Additionally, P12 is concerned about using sink rope on the bottom of a line, which has been suggested to make the waters more whale safe. P12 noted that there would be significantly more wear and chaffing if the line rubs against the bottom. P12 is concerned that if the line is consistently caught on the bottom, there will be more strain on ropes, and more lines breaking.</p>

<b>Participant</b>	<b>Comments Directed to the Department of Fisheries and Oceans (DFO)</b>
Participant 1	If we have to do it, everyone with lines in the water should have to follow the same regulations.
Participant 2	Never seen a whale caught in a single line. People who do singles are not causing problems for whales, but are most affected by these decisions.
Participant 3	N/A
Participant 4	If we are putting this gear in (which is a lot of cost and effort), it is supposed to be safe for whales, so shouldn't we be able to fish during whale closures if we are using the equipment properly?
Participant 5	N/A
Participant 6	There are very rarely any whales where I fish above Point Lepreau. Any policy should have variation for different areas, a range from where whales usually are, not a blanket policy for the whole area.
Participant 7	If it gets mandated that everyone has to do one thing, pick the links. Otherwise, give people choice.
Participant 8	It's unfair that we're doing this stuff in Canada, and Americans are fishing just across the line in American waters, and don't have to follow any closures for whales. Everyone likes to be rewarded for doing something good, and we aren't getting anything good for doing our part. Try to put us on a level playing field! Because we are neighbours with the U.S. side, we see the difference more clearly, and even this past fall it affected crab harvesters in our area.
Participant 9	This won't protect the whales, and is contributing to ruining the fishery.
Participant 10	The fishing industry needs to be consulted before any policy change if you are going to do this right. The harvesters need warning, and if you jump in without talking to harvesters, you're going to end up with more ghost gear, which will hurt whales and other marine life with no added whale safety.
Participant 11	If it keeps the market open, it's worth doing, even if it means jumping through more hoops.
Participant 12	Never seen any whales above Saint John. I'm in shallow water, and I don't know why it's needed here.



# Conclusions

This project has enabled Fundy North Fishermens' Association to gather information about the viability of Whale Safe Gear (WSG) that is commercially available in the fishing conditions of LFA 36. Having harvesters test available gear has had many benefits, including providing data on the viability of specific types of WSG, making local harvesters more familiar with available WSG, and revealing overall takeaways for management and conservation decisions.

Some clear patterns have emerged regarding the viability of WSG in the different conditions fished in LFA 36, limited by the sample size of both the equipment and participants, as well as by the timeline of the project (2021-2024).

1. The **Candy Cane**, **Novabraid**, and **Coastline** all had failures in different testing situations. The Candy Cane and Novabraid failed in all real world situations, whereas the Coastline raised safety issues from jumping in the hauler and durability issues from the Coastline link breaking down over time. Participants unanimously agreed that these were not workable Whale Safe solutions within LFA 36.
2. The **Shippagan** and **Everson** ropes were frequently equated to regular rope, with the variability that comes with different types of commercially available line. Harvesters found that Shippagan worked very well for some participants or not at all depending on their specific equipment needs and compatibility. This is because it sank faster and was a softer lay than some participants typically use, but those same qualities were helpful to other participants. Please see the details of the participants' gear configuration and Appendix A for details regarding needing lines to be light enough for the buoys to be found despite current or tide, or needing lines to be heavy enough to avoid ship traffic. The Everson did not have any noted issues, but was only used for a limited time by three participants.
3. The **Brooks/Plante Links** had no failures, and were generally liked by participants who tried them. Participants also noted that while the **Brooks/Plante Links** were the easiest and cheapest option, there was no way to anticipate wear and replace a line before the link aged enough to give way, which is a significant consideration when considering the implications of gear loss as a result of wear as the typical way harvester avoiding gear loss due to gear failure is closely monitoring wear on their lines. A note regarding replacement frequency; participants noted it was not feasible to replace plastic links each season in an effort to replace links preemptive of failure.

4. Consistent concerns included:
  - a. the **longevity and durability** of the WSG. Most harvesters report that their lines last between 4-8 years, and so lines with WSG would have to be tested consistently for ~10 years before the longevity of WSG could be properly compared to regular commercial gear.
  - b. the **cost** of WSG if it becomes required, especially for those harvesters who use singles or doubles, rather than trawls is significant, especially if more frequent replacement of WSG is necessary.
  - c. the **environmental impacts** of using weaker lines, and therefore increasing Ghost Gear (lost fishing traps and rope that continue to trap and impact the environment). In LFA 36 the variety of fishing conditions resulted in some of our participants using some WSG without issues, whereas other participants chose not to test WSG in the most extreme conditions because they were sufficiently confident it would fail that it was not worth the risk of losing gear. This is because in areas of heavy fishing competition they expect snarls of Ghost Gear to occur and be heavier than 1700 pounds.

This project's takeaways can help guide decision makers on what types of WSG are viable in the majority of LFA 36, as well as the issues that remain. LFA 36 harvesters were exposed to different types of WSG, which was an overall outcome of the project as well.

FNFA had 12 harvesters as participants reporting on their use of WSG throughout this project. Their experience and communication of their fishing time with WSG also allowed many more harvesters in LFA 36 to become familiar with WSG since harvesters work on common wharfs and in shared spaces. When one harvester uses different equipment, they often share their experience with their colleagues, or are asked by their colleagues how different equipment works. At the end of the project we were also able to distribute some additional WSG to harvesters throughout our LFA in order to have them experiment with small amounts of rope or links. While we do not have results from this at the time of this report, we are hoping to continue to have our harvesters equipped to continue trialling WSG and continue the discussion around the implementation of WSG in the Bay of Fundy.

We hope that this project and report can help decision makers in fisheries management and conservation gather practical information about the use of WSG in LFA 36. From a practical

fisheries management perspective, we were able to show that certain types of Whale Safe Gear could be implemented in *most* areas of LFA 36, provided that:

1. financial support was provided to harvesters to transition to the new equipment and compensation made available for additional loss of equipment
2. longer term testing of the longevity of the WSG is undertaken, and
3. plans were made to offset environmental impacts from additional Ghost Gear.

Due to concerns regarding interaction with large snarls of Ghost Gear or extreme natural conditions, some of the productive and heavily fished areas of LFA 36 were not tested at all. Participants were confident that the available types of WSG could not be successfully retrieved in these areas, creating ongoing concerns for any blanket policy requiring the use of WSG. From a conservation perspective, any requirement of WSG usage would need to be weighed against anticipated increases in Ghost Gear. This would include snarls and lines in the water that could not be retrieved through normal means<sup>4</sup>, and would therefore stay in place during Whale Closures.

The use of Whale Safe Gear is one tool out of many that can be used to mitigate the effects of fishing gear on whales. This report helps provide insight into the practical issues, concerns, and possible solutions of implementing WSG in LFA 36. As our harvesters continue to use and test Whale Safe rope and links, we look forward to continued discussions concerning protecting marine mammals in the Bay of Fundy without negatively impacting harvesters who have long worked to protect and celebrate their local marine environment.

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<sup>4</sup> Ghost Gear retrieval is done with specialised equipment, and is dangerous and expensive work.