

Nova Scotia Coastal Conservation & Marine Debris Recycling Initiative
Year 1 Results (2024-2025)

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(2024-2025)

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Executive Summary

Abandoned, lost, and discarded fishing gear (ALDFG), also known as ghost gear, is commonly found in our oceans and on our coastlines, negatively impacting the environment and local industries. Managing ALDFG and other marine debris in Atlantic Canada is challenging due to knowledge gaps in loss rates, ghost gear impacts, regulatory retrieval barriers, and funding restrictions. Coastal Action has been addressing the problem of marine debris for five years. This year, funded by the Department of Fisheries and Oceans Canada (DFO)'s Ocean Management Contribution Program, Coastal Action focused on clean-ups in remote areas, including coastal islands. At-sea retrieval work was conducted opportunistically between other project objectives.

The primary objective of this project was to collect ALDFG and other marine debris from sensitive environments along Nova Scotia's south shore while fostering collaboration among stakeholders from the fishing industry, governmental bodies, non-profit organizations, local communities, and academia. Other objectives included marine debris prevention, reduction, and recycling efforts. This report provides an overview of project retrieval methods and results, with key findings summarized below:

- Five scoping trips were completed along the south shore of Nova Scotia to assess which islands and areas needed urgent attention.
- 20 coastal island clean-ups were completed, with one additional mainland shoreline site remediated.
- Captains from nine vessels assisted in island clean-ups, and two vessels assisted with at-sea retrievals, completing 45 tows over six trips.
- A total of 14,091 kgs of ALDFG and marine debris were retrieved: 13,683 kgs from coastal environments and 407.4 kgs from the sea floor.
- Of the total shoreline debris retrieved, 47.2% were lobster traps or pieces thereof, and 11.7% (approx. 59,022 ft) was rope by weight.
- Of the total at-sea debris retrieved, 94.5% were lobster traps or pieces thereof, and 5.1% was rope by weight.
- Whole traps ranged in age, with a median age of 15 years for shoreline and 17 years for at sea, retrieved traps. The oldest tagged piece of gear found was 41 years old.
- 81% of all retrieved gear and debris were diverted from landfills. Of that, 47.1% went to Fishing Gear Coalition of Atlantic Canada (FGCAC).
- 54,800 kgs of rope and netting were collected from wharf side collection bins.
- 25 collection bins across 16 collection sites were managed with the assistance of 14 Harbour Authorities.

Materials and Methods

Remote Shorelines

To identify retrieval areas, several techniques were explored throughout the duration of the project. Conversations with former retrieval captains focused on areas of previous retrieval success and locations of frequent gear loss. Additionally, consultations with other environmental groups were prioritized, assisting with coordinating efforts locally while maximizing retrieval efficiency. To identify sensitive habitats, consultations with the local NS Department of Natural Resources & Renewables (NS DNRR) personnel and bird habitat experts. Environment and Climate Change Canada's (ECCC) species at risk and critical habitat maps were also referenced for clarity on sites, seasonal restrictions, and permitting. Using this information, areas were selected for further exploration. These areas were scoped, with Coastal Action staff conducting shoreline assessments, either from a skiff or a lobster boat. Data on debris incidence and severity were recorded (Appendix A: Shoreline Scoping Data Sheet), and island clean-up sites were then selected (Figure 1). At-sea retrievals were conducted opportunistically alongside other projects' objectives. Following the herring season, Coastal Action was contracted for three sea days dedicated to gear retrieval around Liverpool.

Twenty island shoreline clean-ups were completed in southwestern Nova Scotia, covering fifteen separate locations in areas around Pubnico, Clark's Harbour, Lockeport, Riverport, Port Mouton, and Sambro. When possible, these efforts engaged community volunteers and other clean-up organizations. Clean-up participants traversed the shoreline on foot, collecting debris along the way. In some instances, all-terrain vehicles to aid in retrieval efforts. All retrieved debris was transported to a centralized collection point, where Coastal Action staff sorted and catalogued each piece. The cataloguing process utilized the Coastal Action ghost gear retrieval data form for shoreline retrievals (Appendix B: Coastal Action Shoreline Retrieval Data Sheet), capturing essential information such as gear weight, length, and tag details. Gear length was measured in feet, and weight was recorded in kilograms using crane scales.

Additionally, observations regarding biofouling organisms and gear condition were documented. The data collected from shoreline retrievals assisted in determining recycling priorities and educational material requirements for community engagement and volunteer initiatives. All retrieved shoreline debris was recycled and/or appropriately disposed of following clean-up efforts with support from partnering organizations such as Fishing Gear Coalition of Atlantic Canada (FGCAC), Sustane Technologies, Mersey Seafood and local waste management facilities.

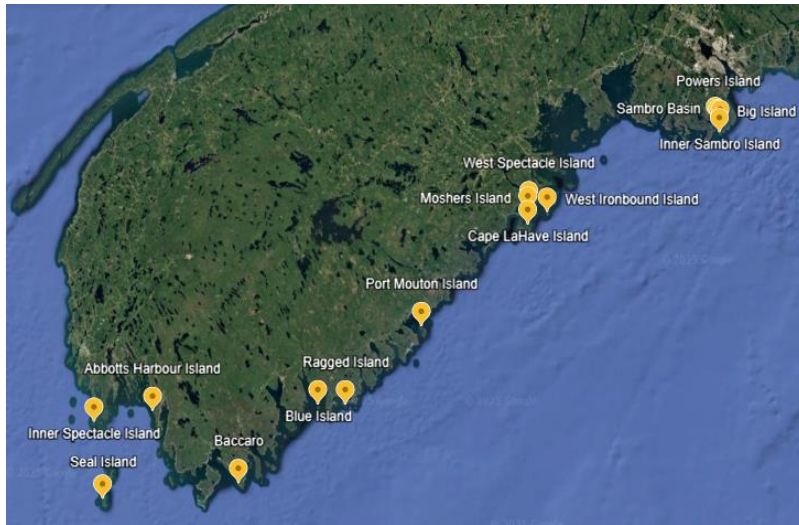


Figure 1. 2024 Nova Scotia remote shoreline clean-up locations.

Rope Collection

Wharf side rope collection bin locations were selected based on a variety of factors. Previous iterations of this project formed the framework of our partnerships with local Harbour Authorities, and bins were reinstalled or continued collections in areas that had previously been established. New ports were chosen based on the Harbour Authority's willingness to participate in the program and the density of fleets in those areas (Figure 2).

In the case of East Pubnico, an extra-large roll-off style bin was deployed. The communities of East and West Pubnico host the majority of lobster vessels in this part of SWNS.

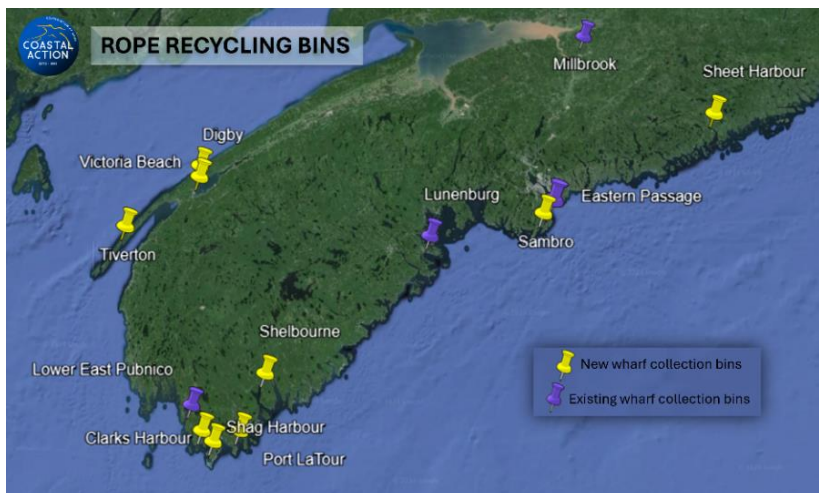


Figure 2. Locations of rope recycling bins across Nova Scotia.

Bins were regularly monitored by Harbour Authorities, local fishing captains, local organizations, and Coastal Action staff. When the bins were full, Coastal Action staff and supporting partners emptied them, sorting the material into recyclable rope and net, incorrectly disposed items that were still reusable or recyclable, and landfill material. Recyclable rope and net were placed in super sacks for pickup and transport back to the Liverpool rope depot, to be diverted to appropriate recyclers. All rope bin communications and collection metrics were tracked throughout the season, contributing to the overall understanding of material volumes and seasonal patterns of accumulation.

Results

Remote Shorelines

A total of 14,091 kgs of ALDFG and marine debris were retrieved: 13,683 kgs from coastal environments (Table 1) and 407.4 kgs from the sea floor. Shorelines had a wide variety of debris, but by weight, fishing gear made up the majority of what was retrieved (Figure 3). Traps were most common, followed by rope and trap pieces. Metal was the most common non-fishing item, followed by rubber and plastic. For at-sea retrievals, traps were the most commonly retrieved item (Figure 4).

Table 1. Shoreline retrieval breakdown summary.

Gear	Inner Spectacle Island	West Ironbound Island	West Spectacle Island 1	Powers Island	West Spectacle Island 2	Cape Lahave Island	Moshers Island	Big Island	Sambro Basin Shoreline	Blue Island 1	Seal Island 1	Seal Island 2	Blue Island 2	Port Mouton 1	Port Mouton 2	Abbotts Harbour 1	Inner Sambro Island	Abbotts Harbour 2	Abbotts Harbour 3	Ragged Island	Baccaro Point	Grand Total	Units
Trap Count	12	13	17	0	37	7	1	0	0	31	29	12	9	8	9	5	13	5	1	47	41	297	count
Buoy Count	17	3	0	15	3	2	1	12	1	3	81	105	9	14	38	48	62	93	40	7	2	556	count
Fishing Gear																							
Traps & Trap Pieces	271.1	328.4	272	27.5	551	128.5	35.2	3.5	0.2	531.5	955.8	599.4	187	170.9	166.7	93.8	285.8	148.12	38.31	873	790.7	6458.44	kg
Rope	18.606	34.8	0	85.3	1.4	36.4	2	6.1	16	42.4	254.9	277.5	90.3	17.8	28.9	307.1	84.6	152.3	131.8	6	12.2	1606.356	kg
Buoys & pieces	19.144	1.6	0	19.7	2.7	1	1.9	7.8	0.9	2.6	184.7	214.3	8.3	14.9	21.2	47.1	40.7	73.2	46.4	2.8	2.1	713.044	kg
Aquaculture Pipe	0	0	0	0	0	0	0	0	0	0	0	0	142.2	0	5.7	197.6	2.8	35.9	1.4	0	0	385.55	kg
Bait Bags	2.6	1	0	0	0.1	4.8	0	0.1	0	1.1	69.1	17.2	0.1	1.5	0.8	0.1	3.6	0.2	0.3	0.2	1.2	104	kg
Other Fishing Gear	35	26.3	0	0.61	4.3	33.3	14.4	4	12.9	73.5	233.5	252.4	17.2	21	24.6	66.62	164.41	32.3	72.21	0.81	12.51	1101.881	kg
Total	346.45	392.1	272	133.11	559.5	204	53.5	21.5	30	651.1	1698	1361	445.1	226.1	247.9	712.32	581.91	442.02	290.42	882.81	818.71	10,369.27	kg
Marine Debris																							
Metal	0.2	2.5	0	0.8	3.7	4.8	19.1	76.5	4.1	2.8	26.7	1097	0.3	1.3	25.8	1.9	32.6	6.4	3.5	1.6	0.1	1311.5	kg
Plastic	6	0.7	0	118.9	11.1	5.4	11.4	29.1	10.4	5.6	41.2	99.21	7.3	15.7	18.91	35.9	57.1	44.4	28.6	3.3	3.4	553.62	kg
Textiles	4.8	2.5	1	18.4	0	16.6	14.1	2.6	0.6	2.8	20.3	6.6	2.3	9.7	9.6	35.5	29.2	11	12.4	0.1	6.3	206.4	kg
Rubber	0.1	2.5	0	41.1	7.6	26.9	2.5	6.6	1.2	2	78.4	27.02	40.7	13.1	11.11	49.11	91.6	69.1	63	3.3	22.2	559.14	kg
Foam	1	0.1	0	65.9	4	0	3	29.8	2.5	0.1	0.7	8	0	1.1	2.3	13.8	70.1	3	3.6	0.2	0	209.2	kg
Fiberglass	0.1	0	0	0	0	0	0	0	0	0	2.3	0	0	0	3	3.9	89.5	20.8	6.1	0.1	0	125.8	kg
Other	0	0.2	0	42.7	24.3	0	0	4.4	1.5	0.3	0	33.95	5.8	7.2	47.1	18.6	141	8.6	11.1	1.7	0.4	348.85	kg
Total	12.2	8.5	1	287.8	50.7	53.7	50.1	149	20.3	13.6	169.6	1272	56.4	48.1	117.82	158.71	511.1	163.3	128.3	10.3	32.4	3,314.51	kg
Grand Total	358.65	400.6	273	420.91	610.2	257.7	103.6	170.5	50.3	664.7	1868	2632	501.5	274.2	365.72	871.03	1093	605.32	418.72	893.11	851.11	13,683.78	kg

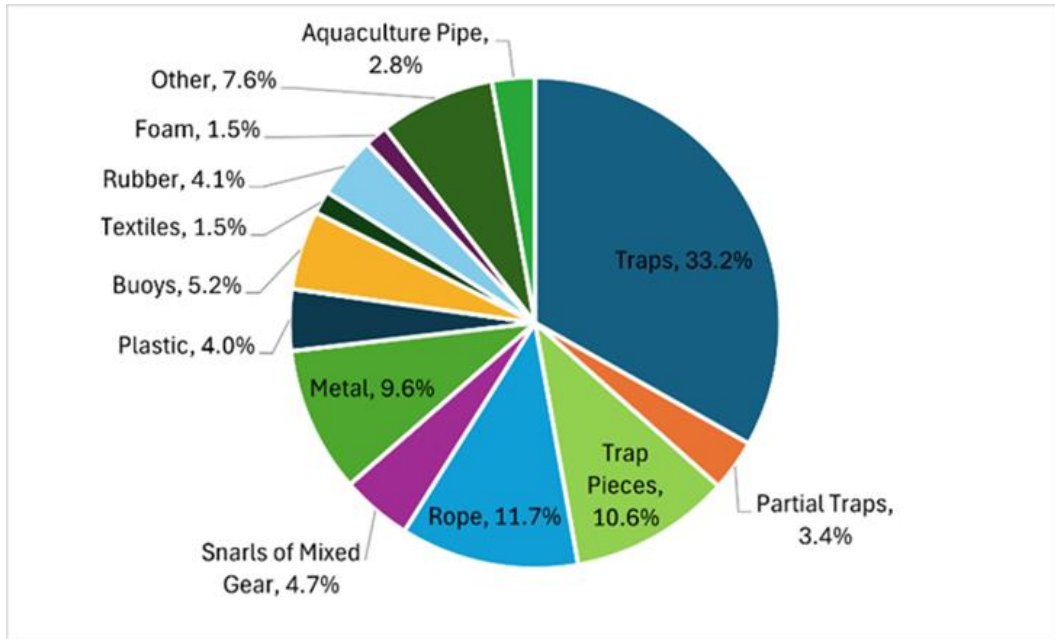


Figure 3. Breakdown by weight of retrieved items from shorelines.

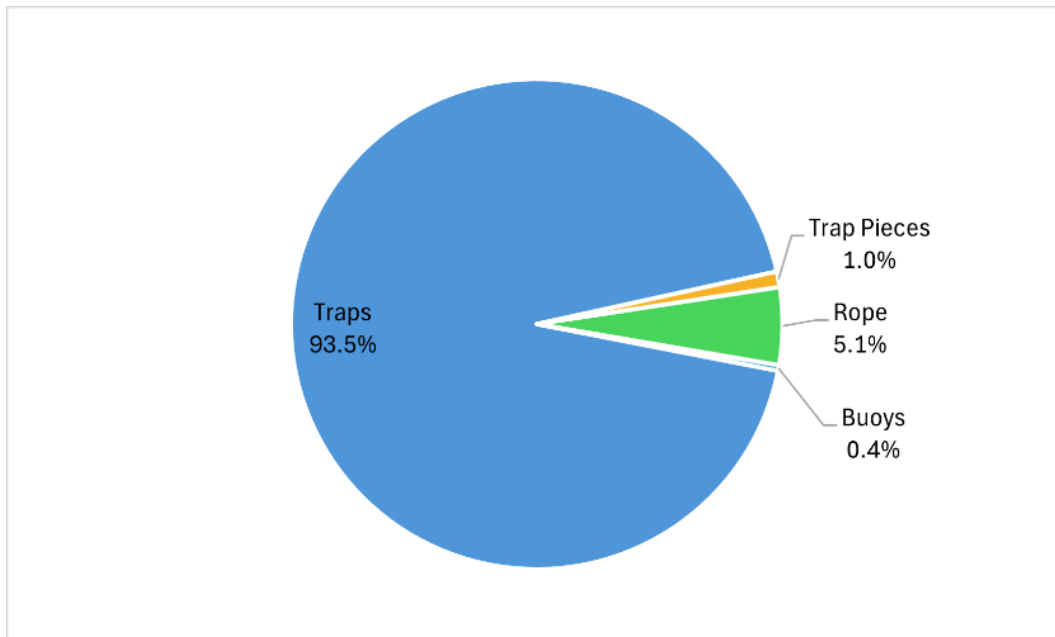


Figure 4. Breakdown by weight of at-sea retrieved items.

A total of 125,138 ft of fishing gear was removed from coastal environments (Table 2). Rope made up 47.2% of this, and monofilament/longline, despite its very low weight of 36.7 kgs, made up another 43.17% by length.

Table 2. Lengths of shoreline fishing gear items.

Fishing Gear	Length	Unit
Rope	59070.37	ft
Monofilament/Longline	54021.1	ft
Mixed Gear Snarls	10874	ft
Net	879	ft
Dragger Cable	59	ft
Seine Line	174.1	ft
Leadline	15	ft
Trap Netting	45.5	ft
Grand Total	125138	ft

The density of debris ranged between islands, though relative density was high overall due to site selection criteria (Figure 5).

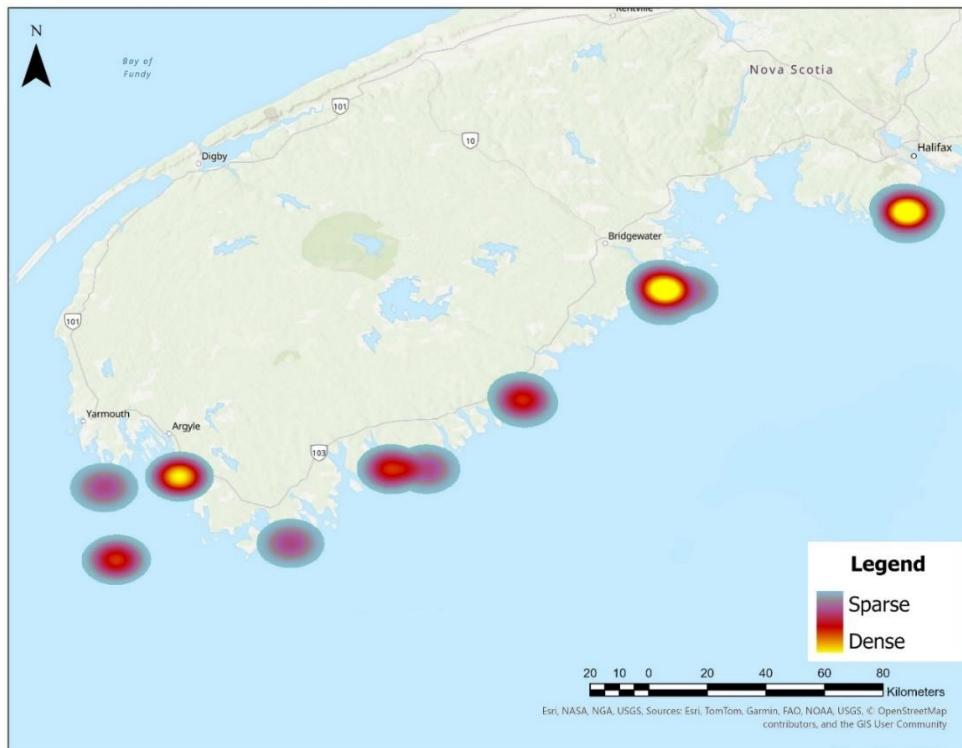


Figure 5. Debris density at clean-up sites by weight.

Every effort was made to recycle as much of the collected material as possible, resulting in 81% by weight being diverted from landfills. Metal traps and trap pieces were dropped off at FGCAC partner sites for the steel to be recycled. Polypropylene and polyethylene rope and netting were transported to either our Mersey Seafood-sponsored collection depot to be recycled through our partnership with Ocean Legacy Foundation or taken to Sustane Technologies to be made into fuel. Plastics of all kinds, including some clean Styrofoam,

were also recycled through Sustane and other items like scrap metal and tires were recycled through municipal and provincial programs. A small fraction of gear and material was reused by staff, landowners, community members, captains and crew, volunteers, or other clean-up groups (Figure 6).

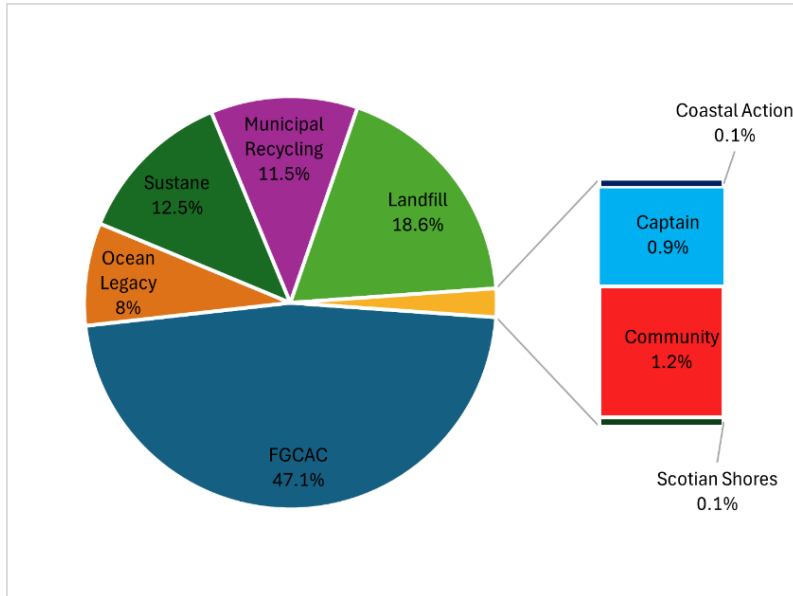


Figure 6. Recycling breakdown by weight for at-sea and shoreline retrieved items.

Rope Collection

A total of 54,800 kgs of rope and netting was collected from sixteen active collection sites in collaboration with fourteen different Harbour Authorities. From the twenty-five distributed collection bins, over 148 super sacks of material were collected, along with an additional seven roll-off bin loads from the Pubnico location. As a major fishing community in Southwestern NS with over 150 vessels, it was no surprise that the Pubnico location ranked first among all bin locations for the highest volume of end-of-life material collected (Table 3).

Table 3. Top 5 material collection locations in Southwestern Nova Scotia

Ranking	Collection Site	Material Weight
1	East Pubnico	25,200 kgs
2	Port La Tour	3,600 kgs
3	Shelbourne	2,400 kgs
4	Clarks Harbour	2,100 kgs
5	Lower Sandy Point	2,000 kgs

While some ports showed lower levels of material compliance, overall bin contamination remained low. Common items found in bins that were not part of the program were lobster tags, anchor links, leadline, and general garbage. Some of these items were still recyclable or reusable and were delivered to other partners and recyclers. In some cases, Harbour Authorities added additional bins to collection sites to accommodate higher demand for material disposal. In those instances, due to a lack of signage on these new bins, they occasionally accumulated higher levels of unwanted waste.

Multiple collaborators played a key role throughout the first year of this project by assisting with bin monitoring, material sorting, and transportation to the collection depot. Interest from other fishing communities continues to grow, but currently efforts are focused on supporting our existing sites and building the capacity to properly recycle material before expanding to additional sites in the coming years. Acquiring technology to improve material metrics tracking, along with increased education and communication, remains a priority moving forward.

Conclusions and Notable Trends

Remote Shorelines

Retrieval captains and the wider shoreline clean-up community shared their expertise regarding areas prone to ghost gear accumulation, as well as gathered valuable insight on locations of debris buildup throughout the project. This collective knowledge was essential for the success of our retrieval efforts.

There was an extreme prevalence of foam, including Styrofoam and expanded polystyrene insulation, and buoys, especially on the Sambro area islands and Seal Island. Foam did not represent a large proportion of the debris collected by weight due to the nature of the material, but it contributed large volumes that filled many super sacks.

Unexpectedly, there was a fair number of larger debris items found throughout the twenty clean-ups. This included four fridges, one deep freezer, one tent and air mattress, one sofa chair, and one engine. Removal of these items required coordination from multiple participants, as most were quite heavy.

One site was overwhelmingly full of ghost gear and marine debris. Seal Island, located approximately thirteen nautical miles off the coast of southwestern Nova Scotia, is situated in a prime location for the accumulation of these materials. Due to its remote location and land access challenges, it has been largely inaccessible for clean-ups in the past. Over two clean-up days, Coastal Action staff and volunteers were able to clean less than 1 km of the

island's roughly 11 km shoreline. Despite this limited coverage, a total of 4,499.95 kgs of debris (Table 1) were collected, sorted, and removed from the island. Two additional clean-ups are scheduled for the 2025 season, with more planned annually for the duration of the project. Given the steady influx of gear and debris, this location will require ongoing clean-ups for the foreseeable future.

One common category seen during clean-ups is textiles. This includes clothing, shoes, rags, and rugs, among others. Unfortunately, as these items are usually very dirty and destroyed, as well as made up of mixed materials, they cannot currently be recycled. Despite this, it is hoped that a recycling partner will emerge in the coming years that can accept these materials as are.

Dragger cable, which is a common gear item retrieved in our at-sea retrievals, was rarely encountered on islands, most likely a function of its weight and history of being dumped at sea. Considerably more longline (a thicker type of monofilament) was retrieved this season compared to other years (Table 2). This material is very durable and tends to tangle itself with other gear and presents a high degree of entanglement risk for wildlife as well. There was an exceptional amount collected from Inner Sambro Island, totaling an estimated 49,361 ft. The total monofilament (including longline) collected for the season was 54,021ft.

Aquaculture pipe was another commonly found material, especially on islands near Lockeport and West Pubnico. Over 400 ft of aquaculture pipe (386 kgs) was retrieved. These pipes are made of high-quality food-grade plastic and are a popular material for reuse by the community.

Rope Collection

There was a great deal of enthusiasm from fishers and community members regarding the rope recycling program. With strong support from Harbour Authorities, Brazil Rock Lobster Association, and Mersey Seafoods, minimal advertising was needed to encourage material collection in the wharf bins. Unsurprisingly, the bins reached capacity more frequently around the start and end of the fishing season, as fishers swapped out or retired their gear. Volumes were especially high at our East Pubnico bin, which served both East and West Pubnico and their surrounding communities, an expected outcome given the majority of the lobster fishing fleet operates in this area. Similarly, Port La Tour, Clark's Harbour, and Shelburne also saw high volumes due to significant numbers of lobster boats. In future seasons, considerations for upgrading bins at high volume locations to better accommodate material collection demands will be taken into account.

Looking ahead, Coastal Action also hopes to deepen engagement with community members who repurpose materials, helping to supply artisans and crafters interested in giving end-of-life gear a new purpose.

Acknowledgements

Deepest thanks to the captains and crew of the retrieval vessels for their support and volunteer efforts at additional uncontracted clean-ups. Thanks to Scotian Shores for site suggestions and the help of their enthusiastic and skilled volunteers. Thanks to all the Coastal Action volunteers for their flexibility and dedication. Sincere appreciation to all the landowners who granted us access to the clean-up sites. Thanks also to the Nova Scotia Nature Trust for their assistance with logistics, especially for the Seal Island clean-ups. Deep gratitude to Mersey Seafoods for their ongoing support of the rope depot and assistance transporting material throughout the province. Thanks to Brazil Rock and the many Harbour Authorities that helped us to advertise and monitor rope bins and to educate their members on responsible gear disposal and recycling.

Appendix A: Shoreline Scoping Data Sheet



Coastal Action Ghost Gear Shoreline Scoping Sheet

Date:	
Island Name/Area Name:	
GPS Coordinates:	
Debris types and amounts:	
Boat access:	
Notable species:	
Estimated days needed to clean:	
Notes:	

