2021 Marine Debris Shoreline Surveys in Eastern Cape Breton

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July 2021

Introduction

Marine debris or most commonly referred to as beach garbage or marine litter is defined by the NOAA as “any persistent solid material that is manufactured or processed directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes”.

The shorelines in Eastern Cape Breton are polluted with plenty of marine debris ranging from fishing related items and plastics to beach towels. Commercial fishing such as lobster and crab fishing are very popular in Cape Breton which explains the large percentage of fishing related debris. Fishing related debris can damage habitats, break down into microplastics, and continue harming marine life for decades after it enters the ocean.

The goal of surveying each shoreline was to better understand the types and amounts of marine debris found on shorelines in Eastern Cape Breton. This study also compares the 2020 and 2021 survey results, showing the slight changes within one year.

Methods

8 shorelines were surveyed throughout Eastern Cape Breton as shown below in Table 1. These shorelines were surveyed between July 7th and July 14th, 2021, and approximately 30-45 minutes were spent at each location. Each piece of marine debris seen was recorded, categorized, and later entered into an excel spreadsheet. Each item and category (fishing gear, plastics, metal, etc.) were then totaled for each location.

Table 1. List of survey locations.

Name	Location
Ferguson's Beach (Long Beach Rd, Port Morien)	46° 9'37.94"N, 59°51'11.34"W
Waddens Cove Shoreline (Bottom of Hiawatha Road)	46° 4'15.66"N, 59°52'57.08"W
Bridgeport Shoreline (Bottom of Davidson St, Bridgeport)	46°13'0.22"N, 59°59'51.67"W
Schooner Pond Shoreline, Schooner Pond, Donkin	46°10'39.43"N, 59°50'39.02"W
Big Glace Bay Beach (Big Glace Bay Migratory Bird Sanctuary)	46°10'38.72"N, 59°55'18.12"W
The Cove (Bottom of Browns Rd Ext, New Victoria)	46°15'47.51"N, 60° 7'17.90"W
Water Street Shoreline (Bottom of Water St, Glace Bay)	46°11'50.46"N, 59°56'51.04"W
South Street Shoreline (Bottom of South St, Glace Bay)	46°10'58.12"N, 59°56'10.27"W

Results

A total of 1176 pieces of marine debris were recorded across the 8 shorelines. The combined results of the 8 shoreline surveys are as follows: 55.2% fishing gear, 18.7% plastic, 8.7% cigarettes, 7.7% metal, 4.2% paper, 2.6% rubber, 1.8% textiles and 1.2% PPE.

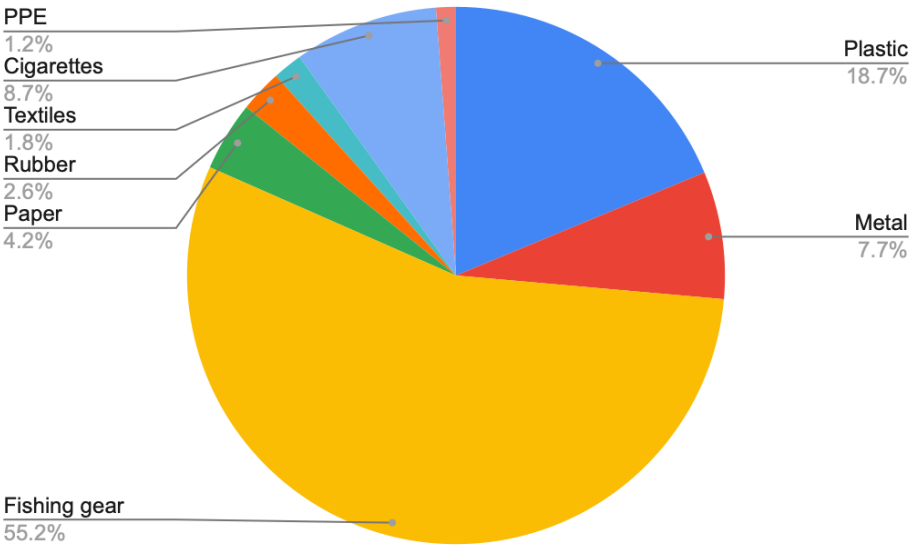

Figure 1. Pie chart based on the 7 separate categories and 1176 pieces of marine debris recorded across 8 shorelines in Eastern Cape Breton.

Evidently, there were some items found much more frequently than others. The 3 most frequently recorded items were lobster bands, followed by rope and wire fragments; all being fishing related items.

Table 2. The top ten most commonly recorded items from the shorelines surveyed.

Rank	Item	Amount
1	Lobster bands	235
2	Rope	113
3	Wire trap fragments	111
4	Cigarette Butts	96
5	Bottles	68
6	Aluminum cans	55
7	Wooden lobster traps	45
8	Coffee cups	44
9	Escape hatches	39
10	Food wrapper	33

Some shorelines were heavily polluted in comparison to others. Bridgeport Shoreline had the most debris, followed by The Cove Shoreline and Ferguson's Beach.

Table 3. The total number of items and the most commonly recorded item from each shoreline.

	Ferguson's Beach	Waddens Cove	Bridgeport	Schooner Pond	Big Glace Bay Beach	The Cove	Water Street	South Street
Total	139	51	293	127	196	288	36	44
Most Common Item	Rope (26)	Wooden traps (23)	Wire trap fragments (53)	Lobster bands (72)	Lobster bands (89)	Coffee cups (28)	Lobster bands (12)	Rope (6)

Figure 2. Wooden and wire lobster traps entangled with rope and other fishing related debris on Ferguson's Beach on July 7th, 2021.

Figure 3. Food wrappers and coffee cups on the Cove Shoreline on July 12th.

Comparing 2020 and 2021 Results

In September of 2020 the same 8 shorelines were surveyed, with similar results. Fishing gear continues to make up roughly 50%, followed by plastics although they reduced from 30.2% to 18.7%. Paper, metal, rubber, textiles, and PPE continue to hold less than 10% of the total marine debris per each category. Paper increased from 1.3% to 4.2%, this is due to the high amount of coffee cups found on The Cove Shoreline. PPE also increased from 0.4% to 1.2% due to the increase in disposable masks found on each shoreline. Lobster bands and wire lobster trap fragments continue to be within the top 3 most commonly found items.
Each shoreline has either remained the same or increased in the number of marine debris found except for Waddens Cove, which reduced from 169 to 51 items found.

Conclusion

To conclude, this study shows that fishing related debris is extremely common in Eastern Cape Breton, making up approximately half of the debris recorded in both 2020 and 2021. Fishing gear is designed to trap and entangle marine life and it continues to do so if abandoned, lost, or discarded. Lobster bands and wire lobster fragments continue to be extremely prevalent on the shorelines in Eastern Cape Breton, and both items continue to cause serious risks. Lobster bands can harm marine life by accidental ingestion, they can also break down into microscopic particles into the ocean. Wire fragments also pollute the ocean due to their synthetic plastic coating which eventually enters the ocean. Plastics are also quite common, following fishing gear in both 2020 and 2021. Plastics break down very slowly into very small pieces called microplastics, microplastics are commonly ingested by marine life which disrupts their digestion processes. This report proves that marine debris is a large issue that must be resolved, particularly fishing gear and plastics.

References

NOAA. (n.d.) What is marine debris? https://oceanservice.noaa.gov/facts/marinedebris.html

MacQuarrie, R. (September 2020) 2020 Marine Debris Shoreline Surveys in Eastern Cape Breton.