

CELTIC SHORES COASTAL TRAILS LITTER INTERVENTION PROJECT

**MUNICIPALITY OF THE
COUNTY OF INVERNESS**

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PREPARED FOR :

DIVERT NS



Contents

Figures	2
Introduction:	3
Methodology:.....	3
Key Findings:	4
Analysis and Interpretation:.....	5
Visual Representation:.....	6
Recommendations:.....	9
Conclusion:.....	10
References:	10

Figures

Figure 1: Troy Station - Identifiable Victim.....	4
Figure 2: Port Hood Station: Social Norms.....	4
Figure 3: Mabou River - Audience Effect.	4
Figure 4: Litter collected from Port Hood Station on September 27th.....	6
Figure 5: 0.25kg of cigarette butts at Troy Station on September 27th.....	7
Figure 6: One of many alcohol cans removed from Port Hood Station on October 4th.....	7
Figure 7: Litter collected at Port Hood Station on October 4th.	8
Figure 8: Litter at Port Hood Station on October 27th.	8
Figure 9: Halloween litter collected at Port Hood Station on November 3rd.	9

Introduction:

The Municipality of the County of Inverness partnered with the Celtic Shores Coastal Trail Association (the Association) to design and install anti littering messaging at three (3) trail heads. The Association is part of five (5) volunteer associations that manages the 92km trail system that stretches from Port Hastings to the community of Inverness. These trails are multi-use trails that combine outdoor recreation, local history, and culture. There are over 30 trail heads and access points along the trail. Due to the number of trail access points, some of which are highly visible from Route 19, they receive a wide range of waste and litter.

The goal of this project was to reduce littering at trail heads, on trails, to identify the form of behavioural messaging that proves the most effective on Cape Bretoners and determine which items are the most littered.

Methodology:

Four (4) trail heads, similar in size, popularity and access to waste receptacles were identified by the Association. Three (3) trail heads received signage with different forms of behavioural messaging to act as the treatment and one (1) trail head was not altered to act as the control.

Locations:

1. Troy Station
2. Michael's Landing (control)
3. Port Hood Station
4. Mabou River

Troy Station was identified by the Association as a litter hot spot. Troy Station had a garbage bin and recyclable container in place prior to the study. The Association removed the receptacles per the Municipality's request for the duration of the study.

Forms of behavioural messaging:

1. Social Norms Messaging: People's behaviour is strongly influenced by what they believe other people do – essentially, what is the social norm.
2. Audience Effect Messaging: The feeling of being watched by others influences people to behave in a more prosocial way. Simply including a pair of watching eyes on a bin can help reduce littering.
3. Identifiable Victim Messaging: Identifying a victim of littering behaviour, for example, a local animal that is impacted by their litter. Research shows that animal victims elicit a greater empathy than human victims.

All trail heads were visited to choose the best location for the signs. Signs were placed in areas that allowed them to be visible by visitors to the trailhead as well as trail users passing by.



Figure 1: Troy Station - Identifiable Victim.



Figure 2: Port Hood Station: Social Norms.



Figure 3: Mabou River - Audience Effect.

Prior to sign installation, all trail heads were visited and monitored for litter to establish a baseline for the study.

After the signs were installed during the week of September 18th, we conducted site visits roughly once a week on various days. The sites were monitored five times after the signs were installed. Monitoring involved performing litter clean-ups at the trailhead and along the trail visible from the sign (within eyeshot of the sign). Litter from each location was collected in separate bags and weighed. This process not only allowed us to measure the amount of litter but also provided a comprehensive analysis of the types of litter being collected.

The study began in September and ran during peak trail season until the temperature dropped and trails were no longer as busy. The last day the sites were monitored was November 3, 2023.

Key Findings:

Table 1: Weights collected during each monitoring visit.

Date	Troy Station (kg)	Michael's Landing (kg)	Port Hood Station (kg)	Mabou River (kg)	Days since last clean up
13-Sep-23	NA	0	0.6	0.6	
27-Sep-23	0.2	0.25	2.65	0.05	14
04-Oct-23	0.05	0.25	1.05	0.4	7
10-Oct-23	0.15	0.15	0.15	0.15	6
27-Oct-23	0.05	0.7	1.45	0.35	17
03-Nov-23	>0.05kg	0.5	0.6	>0.05kg	7
Total	0.45kg	1.85kg	6.5kg	1.55kg	

Analysis and Interpretation:

Troy Station:

Troy Station was initially identified by the Association as a litter hot spot. The Association removed the garbage and recycling receptacles that were in place for the duration of the study and were very concerned that they would see an increase in their litter problem due to the absence of the receptacles. In fact, the opposite is true, Troy had the least amount of litter of all four (4) sites. On September 27th there was a pile of cigarette butts at the trail head – clearly dumped from a vehicle. The entire 0.25kg were from cigarette butts. Most of the litter found at that location was small unidentifiable bits that appeared to be accidental litter from pockets or vehicles, cigarette butts and the occasional tooth flosser.

Michael's Landing:

Michael's Landing commonly had very little litter. On September 13th, litter was observed in the morning and was cleaned up before return to the site for monitoring that afternoon. Most of the litter found was due to the proximity of the trail head to Route 19. On October 27th, Michael's Landing was covered in litter. Dog poop bags, plastic water bottle filled with water, an empty feta cheese container, aluminum cans but was clearly an anomaly. Cigarette butts and small unidentifiable litter were collected weekly but accounted for very little weight.

Port Hood Station:

Port Hood Station was always covered in litter. That location had more total litter than the other three (3) locations combined. Port Hood's litter mainly consisted of alcohol beverage cans and alcohol beverage boxes. Chip bags, take out containers and cigarette butts were other popular items. Alcohol cans were often punctured on the side indicating that they were shot gunned. This brings us to the assumption that a younger crowd are responsible for this litter in the trail head and not trail users. On September 27th, a plastic gas can was found at the trail head. On November 3rd, there were no alcohol cans. There was still a lot of litter but of a different nature. All the litter collected this day was Halloween litter. Halloween goodie bags, six to seven sucker sticks, and wrappers from basically every candy (Aero bars, Twizzlers, Smarties boxes, Swedish Berries, Jolly Rancher gummies, Sour Patch Kids, Tootsie Roll suckers, chip bags, KitKat wrappers, etc.) There was so much litter, it was difficult to park and not cover a bunch of litter.

Mabou River:

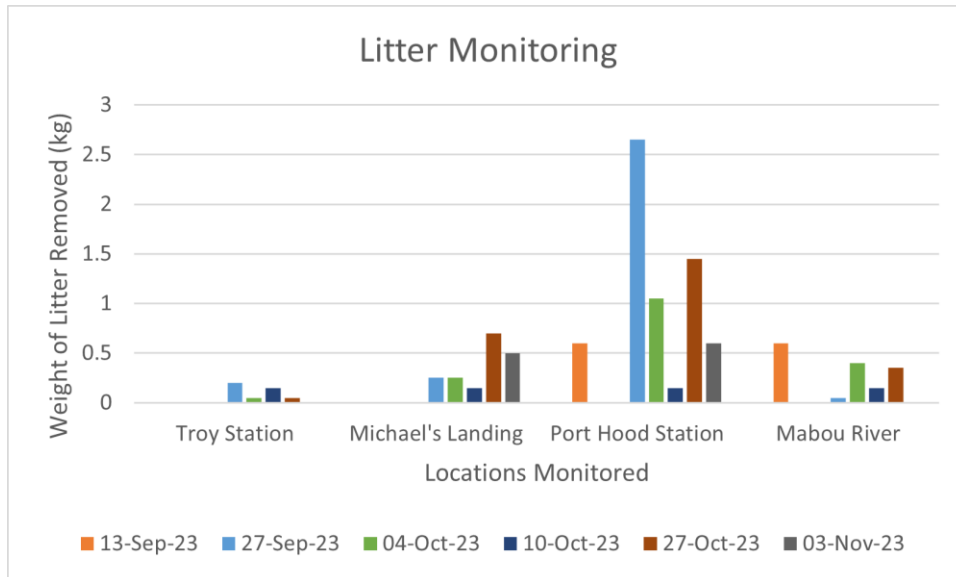
Mabou River was consistently free from excessive litter. Small bits of plastic, cigarette butts and the occasional aluminum can. Some organic litter, orange peels and whole zucchinis were left to rot on the bench. No increase in litter was observed during Celtic Colours International Festival when tourists were all over the island.

The most littered item across every location were cigarette butts.

Although initially stated as one of the goals of our project, I do not believe we have sufficient data to identify which form of behavioural messaging is the most effective. More monitoring prior to sign installation would help in identifying the most effective messaging. Sign placement at the trail heads also would play a role in sign effectiveness. Perhaps it is the most effective form of behavioural messaging but not the most effective sign location.

Visual Representation:

Table 2: Weight of litter removed from each location during the study.



Pictures from litter monitoring:



Figure 4: Litter collected from Port Hood Station on September 27th.



Figure 5: 0.25kg of cigarette butts at Troy Station on September 27th.



Figure 6: One of many alcohol cans removed from Port Hood Station on October 4th.



Figure 7: Litter collected at Port Hood Station on October 4th.



Figure 8: Litter at Port Hood Station on October 27th.



Figure 9: Halloween litter collected at Port Hood Station on November 3rd.

Recommendations:

Based on the results of this study, recommendations were made to the Association to permanently remove the waste receptacles from trail heads, install butt bins to capture cigarette butt waste and relocate the Port Hood sign closer to the parking area of the trail head.

Remove Waste Receptacles

Waste receptacles should be removed from all trailheads. Results from this study indicate that the receptacles at Troy Station were not necessary, and the lack of receptacles will not cause littering to increase.

Install Butt Bins

There were cigarette butts found at every location with at least 10 cigarette butts collected during each monitoring visit. Installing receptacles to manage cigarette butts is recommended. As cigarette butts are often not viewed as litter, installing ballot butt bins like the ones across CBRM may be more effective. The bins allow for custom questions that people can vote on by disposing of their butt in that bin, making properly disposing of the cigarette butt more fun.

Relocate Port Hood Sign

The location of the Port Hood sign was chosen so that the sign is visible from the trail as well as the trail head. Based on the type of litter collected during the study, it does not appear to be trail users creating the litter. Moving the sign to be more visible to those visiting the trail head and littering from their cars may help prevent litter.

Conclusion:

In conclusion, cigarette butts are the most littered items across the four (4) trailheads. They're not commonly perceived as litter and are socially acceptable to discard. However, cigarette butts leach toxic chemicals like nicotine and heavy metals. Despite smokers often believing that cigarette filters are biodegradable, they are made of cellulose acetate—a plastic fiber. This misconception leads to tossing them on the ground, but these filters take years to decompose, breaking into harmful microplastics that significantly impact our oceans and environment. Additionally, littered cigarette butts pose a risk of causing significant wildfires, resulting in widespread damage to our forests and homes. A consequence of tossing your butt not considered in Nova Scotia until the recent wildfires of June 2023.

In the end, we lack adequate data to pinpoint the most effective form of behavioural messaging. Enhanced pre-installation monitoring could have provided insights into the optimal messaging. As mentioned earlier, the placement of signs also contributes significantly to their effectiveness.

By implementing the recommendations, we anticipate a decrease in litter at these sites. The significant litter issue observed at the Troy trailhead, prior to this study, stemmed from unmonitored waste receptacles. Upon their removal, we didn't witness an increase in litter. The installation of interactive butt bins offers the public both an opportunity and an incentive to dispose of cigarette butts properly.

Through these actions, our goal is to cultivate a cleaner and more environmentally conscious community for both current and future trail enthusiasts.

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