

A CHARACTERIZATION OF NOVA SCOTIAN LITTER

2008 Litter Survey

Presented by:

Nova Scotia Youth Conservation Corps

~ and ~

Nova Scotia Environment

Submitted by:

Kayla Oakley

Jessica MacLeod

Keisha Brown

Vanessa Higgins

Supervised by:

Helen Smith



TABLE OF CONTENTS

List of Figures	4
List of Tables	4
Introduction.....	5
Acknowledgements.....	6
Background.....	6
The Issue	6
Tourism.....	8
Agriculture	8
Health and Safety.....	8
Marine.....	8
Litter Abatement in Nova Scotia	9
Provincial Initiatives	9
Anti-Litter Legislation	10
Community and Municipal Initiatives	11
Industry Initiatives	12
Current Status of Litter in Nova Scotia.....	13
Terms	14
Accumulated Litter	14
Brand.....	14
Cap.....	14
Composite Item.....	14
Deposit/Milk Container Litter.....	14
Disposable Cup.....	15
Expanded Polystyrene.....	15
Fresh Litter.....	15
Grocery Store Litter	15
Hazardous Material.....	15
Identifiable	15
Item	16
Litter.....	16
Litter Catch Point.....	16
Miscellaneous Item	16
Miscellaneous Metal	16
Other	16
Quick Service Litter	16
Sealer.....	17
Site	17
Snack Food Litter.....	17
Tobacco Litter.....	17
Unknown Item	17
Methodology.....	17
Safety Precautions.....	18

Materials	19
Safety Equipment.....	19
Litter Collection	19
Data Collection	19
Transportation	20
Site Selection	20
Site Survey	21
Classification of Litter	21
Methodological Challenges	22
Brands	22
Napkins and paper towels	23
Condiment packaging	23
Disposable cup brands	23
Multiple Sources	24
Results.....	24
Total Litter Composition.....	24
Characterization of Litter by Material	24
Characterization of Litter by Source.....	26
Characterization of Litter by Brand	29
Quick Service Litter Composition	30
Quick Service Litter by Material	30
Quick Service Litter by Brand	31
Snack Food Litter Composition	32
Snack Food Litter by Material	32
Snack Food Litter by Brand.....	33
Tobacco Litter Composition	34
Tobacco Litter by Material	34
Tobacco Litter by Brand	35
Deposit and Milk Container Litter Composition	36
Deposit and Milk Container Litter by Material	36
Deposit and Milk Container Litter by Brand	37
Grocery Litter Composition.....	38
Grocery Litter by Material	38
Grocery Litter by Brand.....	38
Discussion.....	39
Comparison of Total Composition with Previous Studies in Nova Scotia.....	39
Litter Abatement Strategies	41
Recommendations.....	41
Education and Awareness	41
Clean-up and monitoring	42
Compliance and Stewardship.....	43
Appendix A: Survey Sites and Directions	45
Appendix B: Brand Structures	60
Appendix C: Litter Offense Fines.....	61

Appendix D: Data Tally Sheet.....	68
Appendix E: Municipal Litter Initiatives Summary	75

List of Figures

Figure 1. Litter survey site locations across Nova Scotia.....	18
Figure 2. Total litter composition by material, including cigarette butts.....	25
Figure 3. Total litter composition by material, excluding cigarette butts.....	26
Figure 4. Total litter composition by source, including cigarette butts.	27
Figure 5. Total litter composition by source, excluding cigarette butts.....	27
Figure 6. Identifiable litter composition by source, excluding cigarette butts.....	28
Figure 7. Identifiable litter composition by brand, excluding cigarette butts.....	29
Figure 8. Quick service litter composition, by material.....	30
Figure 9. Quick service litter composition, by brand.....	31
Figure 10. Snack food litter composition, by material.....	32
Figure 11. Snack food litter composition, by brand.....	33
Figure 12. Tobacco litter composition, by material.	34
Figure 13. Tobacco litter composition, by brand.	35
Figure 14. Deposit and Milk Container Litter, by material.	36
Figure 15. Deposit and milk container litter, by brand.	37
Figure 16. Grocery litter composition, by material.....	38
Figure 17. Comparison of the 1998, 2004, and 2008 litter surveys.....	39

List of Tables

Table 1. Features of sites excluded in the survey.	21
Table 2. Litter classification categories.	22

Introduction

Litter has become a noticeable problem in Nova Scotia. Its most visible effects are impacts to the beauty of the province's natural landscapes, and cityscapes. However, it can also affect industries such as tourism and agriculture, impact public health and safety, and cause harm to wildlife. Besides its negative aesthetic impact, litter also can have negative consequences for public health, the economy, and our environment. While many positive changes have been made, it appears that greater action needs to be taken to combat the problem of litter. This study contributes to a better understanding of the problem, which is an important step towards alleviating the litter situation.

Presently Nova Scotians send 45 per cent less waste to landfills than people in other provinces across Canada. The Nova Scotia government is committed in the Environmental Goals and Sustainable Prosperity Act, to reduce the provincial disposal rate from the current rate of 477 kilograms to 300 kilograms per person per year. When this new goal is reached, Nova Scotia will continue to have the lowest disposal rate in North America. Currently Nova Scotia Environment is renewing the 1995 Solid Waste Strategy in order to meet this ambitious goal.

The present study was undertaken to gain a better understanding of the litter problem in Nova Scotia. Its objective was to characterize Nova Scotian litter by material, origin and brand. The study is in part an elaboration of a 2004 study conducted by the Nova Scotia Youth Corps and the Department of Environment, 'A Characterization of Nova Scotian Litter'. The 2004 study provided a characterization of litter across Nova Scotia, and combined with the 1998 litter study serves as a baseline for this study and others to follow.

The current study uses statistically proven and recognized methodology for the purpose of conducting and analyzing litter data collected from surveys. It is structured upon the Toronto litter survey of 2002. This study was, in turn, derived from the 1993 directive from the Florida Legislature in which the Florida Centre for Solid and Hazardous Waste Management developed a methodology for surveying litter.

The results of the present study can assist the province in developing strategies to abate litter.

Acknowledgements

The successful completion of this litter survey report is due to support from Nova Scotia Environment, the RRFB Nova Scotia¹, and the Nova Scotia Youth Conservation Corps (NSYCC). This support allowed the NSYCC to hire four summer crew workers to collect, count and classify litter. Kayla Oakley, Jessica MacLeod, Keisha Brown, and Vanessa Higgins all worked to complete the 2008 litter survey during July and August 2008.

Background

The Issue

Litter is found throughout Nova Scotia, from urban parks and streets to highway roadsides, and waterways. Even in the most isolated areas of the province, littered items can be found. It is often thought to be an aesthetic problem, taking away from the natural beauty of our province. However, the impacts of litter go further.

Littering is a problem that affects everyone in a community; it is an aesthetic, economic, environmental and hazardous problem that needs to be dealt with efficiently and effectively, sooner rather than later. Litter can impact tourism and agriculture; it can affect public health and safety, and it can be destructive to natural ecosystems, particularly the marine environment.

¹ RRFB Nova Scotia is a non-profit corporation, whose mission is to ensure that the people of Nova Scotia receive the maximum environmental benefits associated with responsible solid-waste management. Information about the RRFB and its programs can be found at www.rrfb.com

Litter poses an un-necessary cost; its clean-up can cost a community thousands of dollars or more, since litter can cause blockages to drainage systems creating flooding.²

Cigarette butts are commonly littered items in many areas. Previous literature indicated that cigarette butts were biodegradable, however, cigarette butts can remain in the environment for a number of years. According to the University of British Columbia, they can remain in an environment for anywhere between 1 and 12 years. Cigarette butts that are thrown away when not properly extinguished can start fires.³ Considering that cigarettes may contain up to 4,000 different chemicals, littering of cigarette butts is a larger problem of which the public should be made aware.

Francis McAndrew, author of *Environmental Psychology*, found that “Litter Begets Litter.” The presence of litter on Nova Scotia roadways, streets, waterways, and parks encourages others to engage in the practice. Research done by the University of British Columbia also shows that littering is a barrier to behavioural change. People that litter are less likely to participate in other acts of conservation including small practices such as limiting use of water and energy.

Many people believe that littering remains a problem due to the difficulty of enforcing municipal and regional littering laws, which are often not enforced with penalties or punitive action. When not caught in the act it is hard to punish an offender. Many other countries, such as Ireland, have found ways around this problem, such as litter hotlines to report illegal dumping, and cameras in central, or highly littered areas. There are many ways to help eradicate the problem of littering, including steep fines, forced community work such as litter clean-ups for multiple littering offenders.

² UBC Litter Reduction Program. Last Updated: September 2007. The University of British Columbia- UBC Waste Management Program. Accessed 28 July 2008 (<http://www.recycle.ubc.ca/litter.htm>).

³ Blacktown City Council- Environment. Littering Information. Posted 2003. Governemnt of New South Wales- Department of Environment and Conservation. Accessed 20 August 2008. (<http://www.blacktown.nsw.gov.au/environment/issues/littering/littering-information.cfm>).

Tourism

Tourism is one of Nova Scotia's most important industries. The province attracts visitors from all over the world. Nova Scotia prides itself on the beauty of its natural surroundings. The province's scenic coastlines serve as a major draw for tourists. In fact, Cape Breton Island was ranked second in the world among 115 destinations, in a survey conducted by National Geographic Traveler⁴ magazine. Even the smallest piece of litter can alter a surrounding habitat and take away from the appeal of an area as a tourist attraction. When large amounts of litter scar the landscape, visitors may leave with a negative impression, and feel reluctant to return.

Agriculture

The agricultural industry is another industry at risk from litter. Glass, plastic and shards of metal have been discovered in bales of hay and in pastures. This is hazardous to livestock if ingested, causing damage to the stomach and other internal organs. It can also cause economic problems for farmers due to the resulting loss of production. Glass and metal that have been collected from open fields can also be damaging to farming equipment, resulting in costly repairs.

Health and Safety

Litter can be hazardous to public health and safety. Serious injuries can result from broken glass. Littered organic material can attract rodents and other insects, resulting in the potential risk of disease. Litter also poses a problem on highways due to trucks with uncovered loads and loose vehicle parts, creating a higher risk for accidents. Illegal dumpsites have also created a problem; they can be a prime location for mosquito breeding grounds due to the collection of stagnant water created by empty containers.

Marine

The impacts of litter are not limited to land. Litter also causes significant problems in marine ecosystems. The province is considered 'Canada's Ocean Playground', but marine litter and debris have caused the ocean surrounding the Nova Scotia coastline to be hazardous to marine species. In the mid-1980's, for example, Sable Island (about 200 kilometres south-west of Halifax) was used as a sampling station to measure the volume of marine litter, as well as

⁴ Tourtellot, Jonathan B. "Destination Scorecard: 115 Places Rated". National Geographic Traveler. March 2004: 60-66.

material types, and trends. Over the course of a month, approximately 8000 plastic items were found to accumulate. More recently, researchers have noted an increase in hazardous materials washed up on the beaches of this island, which can be particularly damaging to marine life. Litter is an aesthetic problem that takes away from the natural beauty of our land. It is a hazard to people, many forms of wildlife, marine species and ecosystems.

Litter Abatement in Nova Scotia

Provincial Initiatives

In 1988, a Minister's task force was assembled to develop a litter strategy for Nova Scotia. The group concluded that stricter punishments should be applied to offenders, including heftier fines⁵. The task force also recommended that the province better educate citizens about the consequences of litter, and provide more signage throughout Nova Scotia, indicating that littering is a punishable offence. Recycling programs were recommended to divert some waste and litter to reusable materials.

Four significant programs emerged from this task force: the creation of Clean Nova Scotia (1988), the deposit-refund system for alcoholic beverage containers (1991), increased litter fines (1995), and the creation of the Nova Scotia Adopt-a- Highway Program (1997).

In 1996, as part of the province's new solid waste-resource strategy, a deposit-refund system was expanded to include all beverage containers, with the exception of milk. Citizens can return their beverage containers for a refund at any of the province's Enviro-Depots. The program is administered by the Resource Recovery Fund Board (RRFB Nova Scotia). In addition to boosting recycling rates for beverage containers in Nova Scotia, the deposit-refund system has provided an incentive to keep containers off of our roadsides.

⁵ "The Minister's Task Force on Litter Abatement. Report". Nova Scotia Department of the Environment. October 1988.

RRFB Nova Scotia has also taken initiative in addressing the litter problem, particularly through education. They have developed innovative and successful methods of maintaining high public awareness of waste management issues, such as litter. These include Moby S. Loop, an interactive educational robot used in schools and public events, school resource material (including a childrens' book about litter), and sponsorship of clean up programs. RRFB Nova Scotia also organizes an annual school contest every year in which litter abatement is a common theme among various grade levels. They have also provided litterbags for waste and recyclables at tourist centres. These bags are distributed to travelers in efforts to prevent roadside litter, and educate them about waste reduction practices in Nova Scotia.

Anti-Litter Legislation

Laws on litter and littering in Nova Scotia are found under the Environment Act administered by the Nova Scotia Environment, and the Motor Vehicle Act, administered by the Nova Scotia Department of Transportation and Infrastructure Renewal. Complete regulations are found in Appendix C. Under the Environment Act, a first time littering offender may be subjected to a summary offence ticket of \$452.00 in an out-of-court settlement. Under the Motor Vehicle Act, the fine for littering is \$387.50. In default of payment, the offender may be subject to imprisonment for up to fifteen days. Offenders are also liable for the expense of removing the litter, refuse, garbage or other materials. Litter and littering legislation may also be found in other Acts and municipal by-laws. For a complete list, refer to Appendix C.

Similarly to Nova Scotia, other provinces have recognized litter as an issue. In Prince Edward Island the fine for littering is \$200.00 for an individual, and \$1000.00 for a corporation. Alberta is making revisions under the Procedures Regulation to increase the price of fines, but currently the provincial fine is set at \$250.00 for an individual and \$1000.00 for a corporation. British Columbia has a fine of \$100.00 which is given to people who leave their garbage in a public place. In Quebec, if something is thrown on the road the fine is \$60.00 plus taxes.

Many countries and cities around the world take great pride in the way their home looks and the subsequent litter fines are vigorously enforced. In Singapore, littering offenders are faced with a fine up to \$5000.00, given counseling sessions, their picture on the local news, and on Sundays are required to clean up litter wearing a banner that says, “I’m a litter bug!”. Australia has a number of different fines that are given out to people who litter. For example, littering something that can be potentially harmful (broken glass) costs \$375.00 for an individual and \$750.00 for a corporation. In Philadelphia, USA when fined for littering, if challenged in court and not won, the judge will double the fine from the original \$150.00 up to \$300.00. A fine of £50 (roughly \$100 Canadian Dollars) is being enforced by wardens all over the United Kingdom for people caught littering; the most common object they fine for is the cigarette butt. The wardens in the UK are given £35 for every ticket issued instead of a salary.

Community and Municipal Initiatives

Community groups and non-governmental organizations are responsible for a number of successful clean up initiatives in the province. Some of these are one-time events, while others are annual or ongoing programs. Two examples are The Great Nova Pick Me Up and the Adopt-a-Highway Program.

Each spring, community groups, businesses, schools and municipalities participate in “The Great Nova Scotia Pick Me Up”. Clean ups can take place any time of year, and in any location – a beach, park, school yard, etc. The program encourages people to pick up litter in their communities, while educating them on the effects of litter on our environment. This program is administered by Clean Nova Scotia and receives financial support from RRFB Nova Scotia.

The Adopt-A-Highway program is another program which aids in the roadside clean up of litter across the province. The program, which is international in scope, started in 1991 in Nova Scotia by the Women's Institutes of Nova Scotia, the Lions Clubs and Clean Nova Scotia. Community groups adopt a stretch of highway, which they commit to cleaning up two times per year. They

are recognized for their efforts by highway signs along the adopted section of roadway. Over 100 sections of highway have been adopted in the province, covering 700 km, and more than 1,000 volunteers participate in Nova Scotia each year. RRFB Nova Scotia provides major funding to this program, with support from the Departments of Nova Scotia Environment and Transportation and Infrastructure Renewal.

Another significant clean up initiative takes place annually on McNab's and Lawlor Island. Large-scale cleanups are held on each of these islands each spring and fall. Over 5,000 bags of trash have been collected since 1991 when the program started. The beach clean up is funded by the Shell Environment Fund, the Department of Natural Resources and Parks Canada., Clean Nova Scotia provides supplies, such as garbage bags.

Municipal initiatives to clean up and reduce littering vary greatly between municipalities. Clean-up is the primary focus of most municipal litter projects. Two municipalities additionally focus on awareness and education. Often municipalities work with other established programs such as the TD Shore Line Clean-Up, the Great NS Pick-Me-Up, and the Adopt-a-Highway program. A few municipal units offer financial incentives for non-profit organizations who clean up litter in their area. Please refer to Appendix E for a more complete list of municipal activities in each of the seven solid waste management regions.

Industry Initiatives

Private industry has also made some efforts towards litter abatement. In the quick service (i.e. fast food) industry, Tim Hortons has been active in helping to organize and promote community clean-ups across Canada. The company has also implemented an anti-litter advertising campaign. Other quick service chains have contributed towards responsible waste management, by implementing source separation programs, and advertising about littering.

In efforts to reduce disposable cup waste, a number of coffee shops in the province give patrons a discount for using reusable coffee cups. Examples in Halifax Regional Municipality include

Tim Hortons, Perk's, Trident, and several smaller independent cafés. Common discounts are \$0.05 to \$0.10 off the price of a coffee, with others offering 15% off or simply charging a flat rate for any size cup. This type of economic incentive promotes a reduction in disposable cup use, and thus, a reduction in this type of litter.

Over the past 12 months, there has been an increased effort to reduce the amount of plastic bags used in various retail and grocery stores across Nova Scotia. Both the Atlantic Superstore and Sobeys offer reusable bags for only a dollar at all of their locations, and many other smaller retailers such as Pete's Fruitique offer similar services. In addition, various incentives such as store points or discounts are offered to customers who bring their own reusable bags to the store. While the primary purpose of this effort is to reduce waste, this effort may also impact the amount of plastic bag litter.

Current Status of Litter in Nova Scotia

Despite all of the efforts across Nova Scotia, litter remains a significant issue. A 2004 report prepared by GPI Atlantic⁶ identified litter as a solid waste problem in the province. Although improvements have been made since the initiation of the 1995 Environment Act and the beverage container program, litter continues to be visible along Nova Scotia's streets, and highways.

Recognizing that litter is a problem in Nova Scotia, the government made amendments to the Environment Act in 2006 which toughen anti-litter legislation. Such amendments include increasing the amount of litter fines and creating a minimum fine for offenders, defining the term litter and including it in the Act, differentiating between individual offenders and businesses, as well as allowing the courts to order an offender to clean up a site. The department has also proposed removing restrictive language to make it easier to prosecute offenders.

⁶ GPIAtlantic. "The Nova Scotia GPI Solid Waste-Resource Accounts." July 2004.

As part of the government's efforts to address the litter problem in the province, Nova Scotia Environment has sponsored the present study. This study will allow for comparison with the 2004 Litter Survey.

Terms

For the purposes of this study the following terms are defined:

Accumulated Litter

Litter that has collected over time.

Brand

A trademark or distinctive name identifying a product or a manufacturer⁷.

Cap

The aluminum covering on a glass (normally beer) bottle.

Composite Item

A single item made up of more than one type of material. Examples are candy wrappers, chip bags, candy bar wrappers and disposable cups.

Deposit/Milk Container Litter

Litter originating from deposit containers and milk containers. To maintain consistency with the 2004 litter study, this category includes labels, but excludes bottle lids, caps, sealers and six pack rings. These last four items are classified as miscellaneous.

- **Deposit Container:** Any beverage container⁸ in which a deposit is paid when purchased in Nova Scotia, and a refund given when returned to an ENVIRO-DEPOT.™ Deposit

⁷ www.dictionary.com

⁸ As defined by Nova Scotia's solid waste-resource management regulations, "beverage" means any liquid that is a ready to serve drink, but does not include milk, milk products, soya milk or concentrates; "beverage container" means a container of less than 5 litres which contains or has contained a beverage and was sealed by the manufacturer after the beverage was placed in it.

containers include refillable beer bottles as well as non-refillable containers, such as plastic pop bottles.

- **Milk Container:** A container which holds a dairy beverage. Examples are cartons, plastic jugs, and plastic bags. These containers are not included in the province's deposit-refund system.

Disposable Cup

A cup which is intended to be used once, and not refilled. Examples are coffee cups and cold drink cups served at quick service restaurants.

Expanded Polystyrene

A rigid, white foam plastic (resin code #6) that is commonly used in items such as disposable cups. It is commonly referred to by the trademark name Styrofoam™. To maintain consistency with the 1998 and 2004 litter studies, expanded polystyrene forms its own category, separate from other plastics.

Fresh Litter

Litter that collects after accumulated litter has been removed from a site.

Grocery Store Litter

An item originating from a grocery store, which is not categorized as a snack food, deposit/milk container or tobacco product. Items include grocery bags, large food packaging and packaging for household products.

Hazardous Material

Any material having properties that may result in risk or injury to health, destruction of life or facilities. Hazardous materials, as defined, include toxic, flammable, corrosive, asphyxiating, and explosive materials.⁹

Identifiable

- **By Brand:** An item which is marked by a brand name, symbol or other characteristic which distinguishes its brand.
- **By Source:** An item which can be distinguished as belonging to one of the five source categories used in this study.

⁹ Occupational Health & Safety Division. Nova Scotia Department of Environment and Labour. "Reference Guide to the Workplace Hazardous Material Information System Guide". <http://www.gov.ns.ca/enla/pubs/ohs/whmis.pdf>

Item

A single piece of litter which is collected in the process of the litter survey. Fragments of a broken glass item, such as a container are counted as one item. In this study, cups and lids/straws found together were paired up and counted as one single item. Extra disposable cups, lids, and straws were recorded as separate items.

Litter

An article of human made or human transported solid waste that had been deposited or disposed of in an improper place. Exclusions include natural flora and fauna, dog and cat litter, agricultural products and tree bark. Examples of litter are man-made items such as chip bags, disposable cups, and plastic, paper and other products. Items below bottle cap size (25 mm diameter) such as cigarette butts are excluded.¹⁰

Litter Catch Point

The obstacle where litter collects on the edge of a site. Examples are fences, tall grasses, hedgerows, and ditches.

Miscellaneous Item

Any item whose source cannot be classified into one of the five categories used in this study (i.e. quick service, deposit/milk container, snack food, tobacco product, or grocery store product). Examples are papers, unidentifiable packaging, metals, construction debris, cloths, lottery tickets, and bus transfers.

Miscellaneous Metal

A metal item, which could not be identified by its specific metal type (i.e. steel, aluminum or other).

Other

Identifiable items (i.e. distinguishable brands) which were not found in significant numbers.

Quick Service Litter

Litter originating from items distributed by a quick service restaurant (commonly referred to as 'fast food'). Items include, but are not limited to plates, paper bags, condiment packaging,

¹⁰ Syrek, Daniel B. and Resource Integration Systems Ltd. "Ontario Litter: 1990." The Institute for Applied Research. January 14, 1990. p. 29.

cutlery, napkins, disposable cups from the quick service establishment, straws, food containers and wrap, and cup trays.

Sealer

The disc-shaped covering underneath the lid on a deposit or milk container.

Site

The specific location of each litter survey. The area of a site is made up of two 100-metre sections of roadside, with a maximum width of eight meters on either side.

Snack Food Litter

Litter originating from items sold as packaged ‘snacks’. Examples are chip bags and wrappers from chocolate bars, candies, gum, and cough drops.

Tobacco Litter

Litter originating from the packaging of cigarettes and other products containing tobacco. Examples are cigarette packs, foils, and plastics.

Unknown Item

An item which cannot be identified by brand name due to weathering, decomposition, damage or the absence of a brand name or symbol.

Methodology

The Nova Scotia litter study is a count of accumulated visible litter. Items the size of a bottle cap or larger (25 mm diameter) were included in the survey.

Litter was collected from 55 sites across the province, and the 2008 survey maintained the same sites as the 2004 litter survey. The distribution of these sites was based on population (2000 Canadian Census) with approximately one site for every 20,000 residents. In 2004 the sites were randomly chosen throughout the seven solid waste regions, and attempts were made to have a minimum of one site per county (Figure 1). A detailed list of site locations and directions is found in Appendix A.

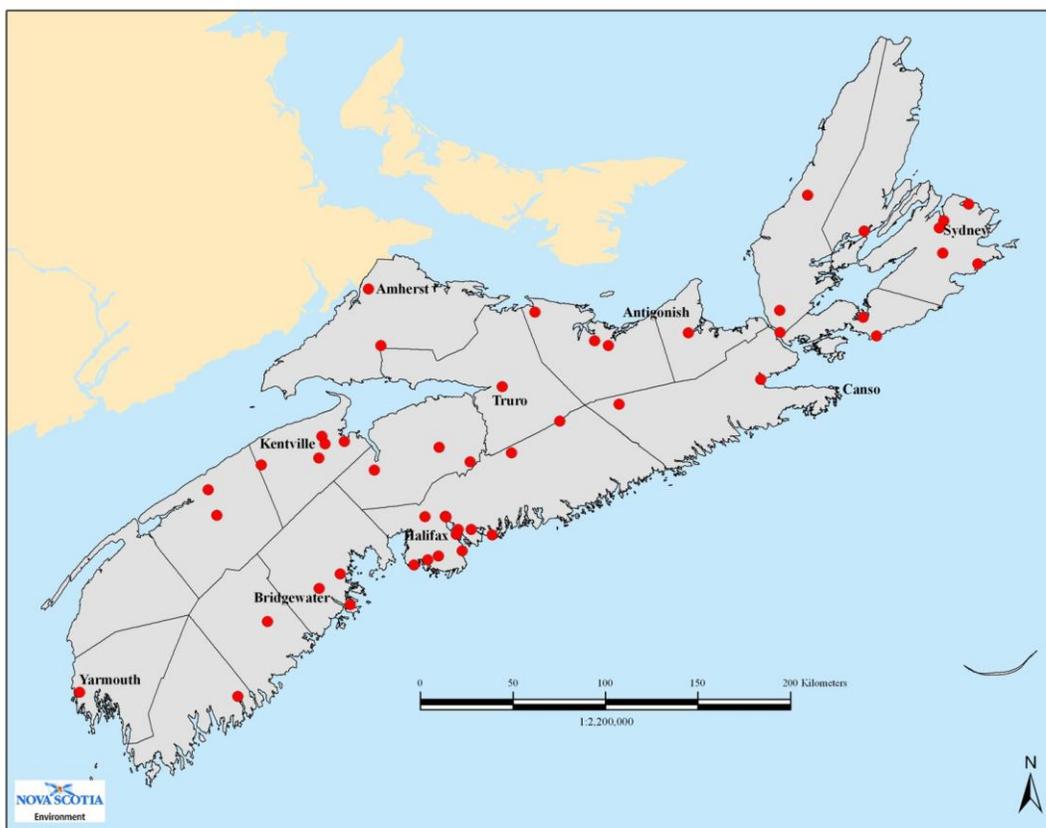


Figure 1. Litter survey site locations across Nova Scotia.

One difference in methodology was that cigarette butts were collected in the 2008 litter survey in order to understand the extent of these littered items. Numbers for cigarette butts were excluded in comparison tables with the 2004 litter survey data.

Safety Precautions

Ensuring the safety of crew members was a primary concern in this study. Three main hazards were identified: motor vehicles, dangerous terrain and potentially harmful litter (ie. broken glass, biohazardous material). Appropriate precautions were taken to minimize risks from these hazards.

Crew members underwent Occupational Health and Safety training, and WHIMIS training at the Nova Scotia Youth Conservation Corps Training Camp to increase awareness of potentially hazardous situations and materials. The crew also received emergency first aid training. The crew was required to wear proper safety apparel, confine litter pick up to behind the ditch line, work only during daylight hours and exclude 100 series highways from the survey.

Materials

The materials and equipment chosen for this study served several purposes: ensuring the safety of crew members, serving in the collection of litter, ensuring accuracy in measurements, and providing a means of recording data.

Safety Equipment

- Cut resistant gloves
- Boots (steel toe)
- Vests
- First aid kit
- Cell phone
- Pylons (Markers)

Litter Collection

- Measuring tape (100m)
- Garbage bags
- Recycling bags
- Flagging tape

Data Collection

- GPS (global positioning system)
- Digital camera
- Data sheets/ clips boards
- Pens and pencils

Transportation

- Rental Vehicle
- Government Vehicle
- Personal Vehicle

Site Selection

The 2008 litter survey re-visited the same sites as the 2004 litter survey. A process of random site selection was used to ensure an unbiased method. Site selection was completed prior to fieldwork. Directions to each site were included to assure no prejudice in the field.

The number of sites selected for the 2004 Nova Scotia litter survey was determined by population statistics per county collected from the 2000 Canadian Census. With a 1:20 000 apportionments the number of sites to be surveyed was determined to be 55. There were 220 randomly chosen sites with centre line locations entered into a random number database (Quattro Pro 9), with the population ratio constant. From this database the final 55 sites were selected and directions were determined from the destination-ns website (<http://temp.destination-ns.com/common/directory/places.asp>). Note that sites were surveyed in every county of the province with the exception of Digby, due to its small population size.

An additional three sites for each county were randomly chosen as 'back up' sites. If any of the initial sites fell into one of the following categories, it was discarded and one of the back up sites for that county was used.

Table 1. Features of sites excluded in the survey.

FEATURES OF SITES EXCLUDED IN SURVEY
Major highway (100 series highways)
Location on bridge
Location within construction area
Location on railway
On water
Hazardous location
Access difficult or impossible
Location within private or industrial lands
Adopt-a-Highway section (noted if site was adjacent)

Site Survey

Surveys were conducted in the month of July and the first three weeks of August 2008. A tape measure was used to measure 100 linear meters on each side of the roadway, and the width of each site was recorded on the summary sheet for that site. Width was measured from the side of the road to the litter catch point, or to a maximum of eight meters. A GPS (global positioning system) reading was taken at the start point of each survey to record site coordinates, and a photograph of the site was taken from both the start and end points. Special features of the site were also recorded. A sample data sheet is found in Appendix D.

In collecting litter items, the crew was divided into two teams of two members, with each team surveying one side of the road. All collected litter was brought back to the base of the site for classification.

Classification of Litter

Classification of litter was recorded by two team members on separate data sheets to ensure accuracy. Data sheets were compared for consistency prior to disposing of the litter. One datasheet was used for each site, and litter items were recorded in three categories: material, source, and brand. (Appendix D). Each category was broken down as follows:

Table 2. Litter classification categories.

MATERIAL	SOURCE	BRAND
Plastic	Fast food	Tim Hortons, McDonalds, Players, KFC, etc...
Expanded polystyrene	Deposit/Milk container	
Metal (aluminum, steel, miscellaneous)	Snack food	
	Tobacco product	
Glass	Grocery product	
Paper	Miscellaneous item	
Wood		
Rubber		
Cloth		
Composite		

Methodological Challenges

Once the study began, some unexpected challenges arose while categorizing litter items. Below is a list of items which should be taken note of in future studies.

Brands

In this study, brands recorded in the field were from names and symbols found on litter items. However, for purposes of analysis, when items were found that had a larger parent company, they were categorized under the parent company name. For example, items such as O’ Henry

bars, Jolly Ranchers, and Twizzlers were grouped together as Hershey items, since this corporation owns these products. A list of such items with their respective parent companies is found in Appendix B.

When comparing brand results from this study to those from other studies, this method of analysis should be kept in mind. Ownership structures among brands change from time to time. In order to maintain consistency with the 2004 Litter Survey, the ownership structure of brand names was maintained in this study.

Napkins and paper towels

Where a brand was not distinguished, napkins were placed in the ‘napkin/paper towel’ category, and the ‘Miscellaneous’ source category. If a napkin displayed a brand which could be traced back to a particular source it was characterized under that source. (For example, napkins from McDonalds are clearly marked and are categorized under ‘quick service.’)

Condiment packaging

It was often difficult to determine the specific quick service source of a condiment. For example, a ketchup package from a quick service restaurant may be labeled by the ketchup brand (i.e. Heinz) rather than by the restaurant name. All condiment packaging was classified under quick service litter even if the source was not marked.

Disposable cup brands

Some quick service restaurants sell drinks in ‘Coke’ or ‘Pepsi’ cups. In this case, the exact restaurant origin could not be distinguished.

Multiple Sources

Some quick service restaurants, such as Tim Hortons sell deposit beverages under their own company labels, causing a ‘blurring’ of categories. Tim Hortons branded bottles and cans were placed in the deposit/milk category in this study.

Also, some items originated from more than one source. An example is straws. In this study, all straws were classified as ‘quick service’ although it is recognized that a small portion may have come from convenience stores.

Results

Total Litter Composition

Over the course of this study, 16,388 pieces of litter were collected and counted. Excluding cigarette butts (which alone counted for 11,420 pieces of litter), 4,968 other individual pieces of litter were collected. This represents a 21% growth in litter since the 2004 survey where 4,093 items were collected. All items collected were classified by source, material, and brand.

Characterization of Litter by Material

Items were classified into one of 11 material categories: plastic, composite, paper, metal-ferrous, metal-aluminum, metal- miscellaneous, glass, wood, rubber, cloth, and expanded polystyrene. Figure 2 indicates the most abundant materials found. Composite items made up about 77% of litter collected, and this category composed mainly of cigarette butts. Plastic and paper represented 12% and 6% of all litter, respectively. Together, these three materials constituted 95% of the total litter collected, leaving a small slice of the pie representing the remaining eight categories.

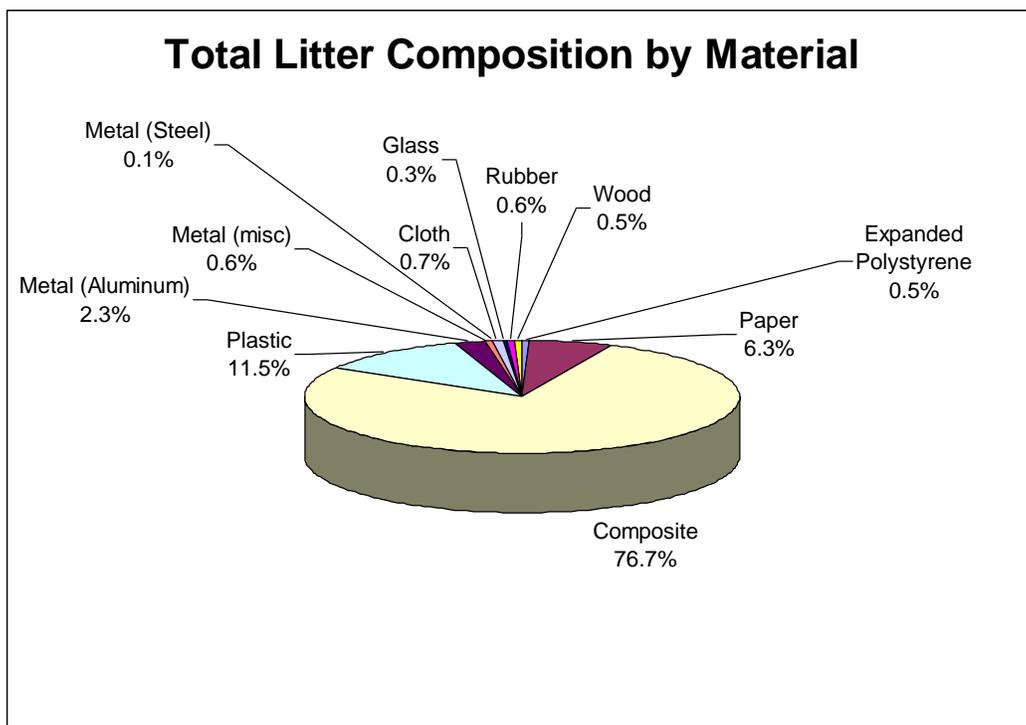


Figure 2. Total litter composition by material, including cigarette butts.

In order to compare the 2008 results with the 2004 litter survey results, total litter composition by material was calculated excluding cigarette butts (Figure 3). Plastic, paper, and composite items made up about 37%, 20% and 26% of all litter, respectively. Together, these three materials constituted 83% of the total litter collected, leaving a small slice of the pie representing the remaining eight categories. This indicates a slight change from the 2004 survey where more paper (28%) than composite (24%) items were collected. Still, this shift in collected litter material was relatively minor, and other wise material composition was similar in 2004 and 2008.

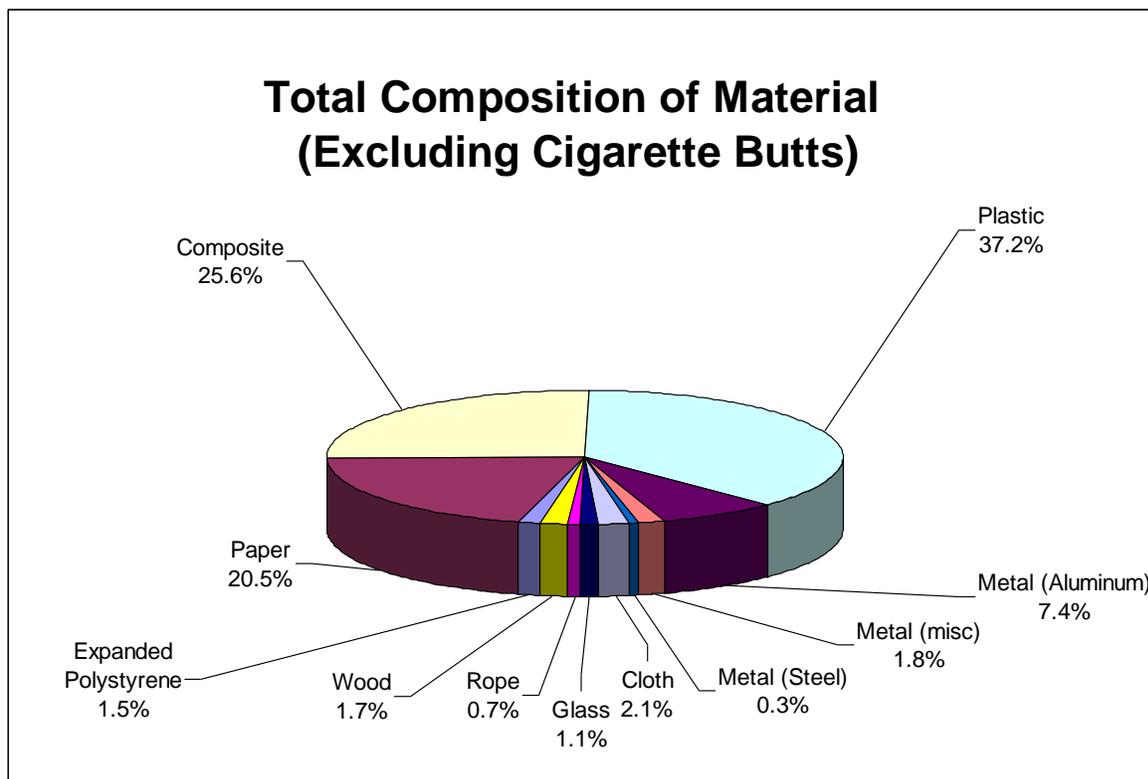


Figure 3. Total litter composition by material, excluding cigarette butts.

Characterization of Litter by Source

Items were classified into one of five source categories: quick service, snack food, tobacco, grocery, and deposit/milk container (Figure 4). Approximately 83% of all litter items were placed into these categories, with the remaining 17% categorized as “miscellaneous.” Tobacco products accounted for the vast majority of all litter at 73%, while quick service and snack food accounted for about 8% of all litter. This result varies greatly from the 2004 litter survey due to the inclusion of cigarette butts in the litter count. In order to directly compare the 2004 and 2008 survey results, source categories were also calculated excluding cigarette butts (Figure 5.).

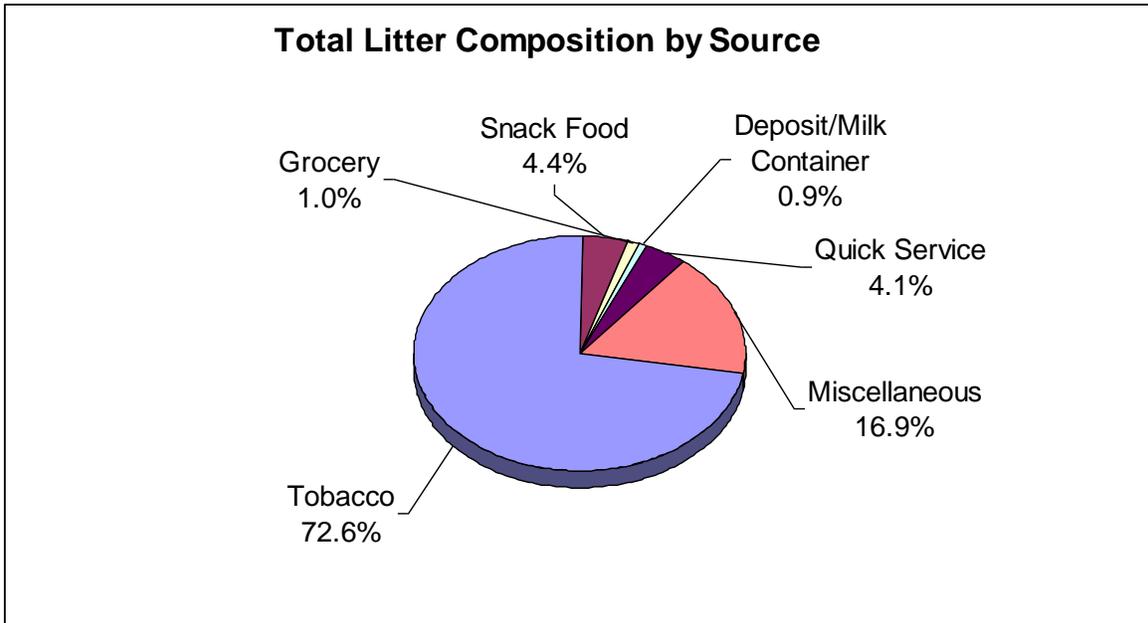


Figure 4. Total litter composition by source, including cigarette butts.

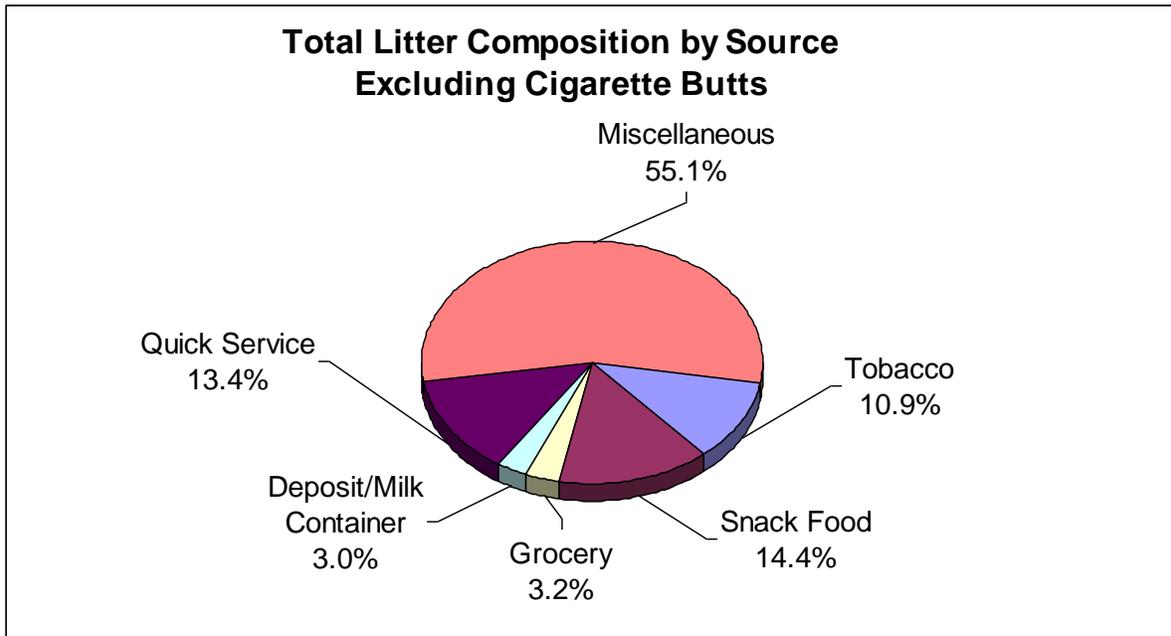


Figure 5. Total litter composition by source, excluding cigarette butts.

When cigarette butts are excluded from the source analysis, the 2008 survey results are similar to the 2004 findings. Snack food accounted for a larger share of the litter composition compared to

quick service at 14% and 13 % respectively. A more interesting comparison of the 2004 and the 2008 survey results is the total identifiable litter by source excluding cigarette butts (Figure 6).

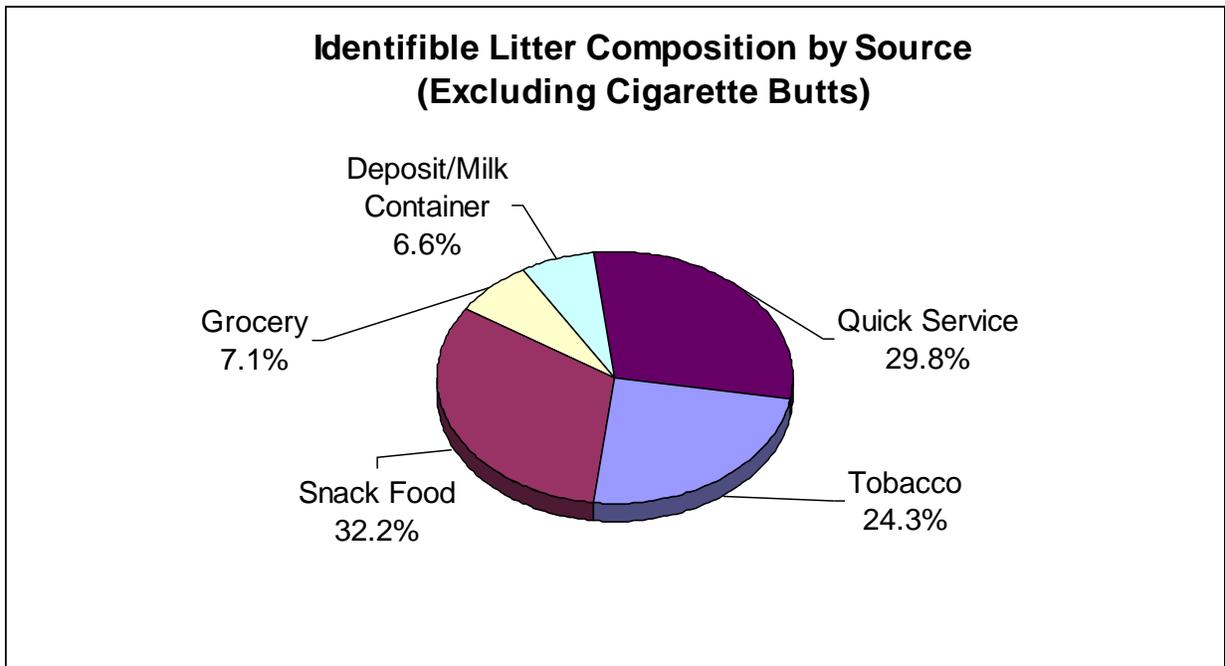


Figure 6. Identifiable litter composition by source, excluding cigarette butts.

Excluding miscellaneous items, 32% of all litter was from the snack food industry. Items in this category included chip bags, and wrappers from chocolate bars, candy and gum. The second most abundant source of litter was the quick service industry at 30%. Items in this category included disposable cups, lids, straws, food packaging and other “fast food” items. The third most abundant litter source was tobacco products at 22%. These three sources made up 90% of all litter collected.

Characterization of Litter by Brand

Brands could be distinguished for 46% of the total litter items collected. The remaining 54% of the litter found was without a brand, damaged, or unidentifiable due to weathering and decomposition. Most unknown brands fell into the miscellaneous item category. When cigarette butts were included, Canadian Classic accounted for 29%, Players for 22%, and Peter Jackson for 10 % of branded littered items. Export A and Tim Hortons rounded out the top five brands at 7% and 4% respectively.

When tobacco products were excluded from the analysis, Tim Hortons accounted for 26% of all branded littered items, followed by McDonalds at 8% (Figure 7.)

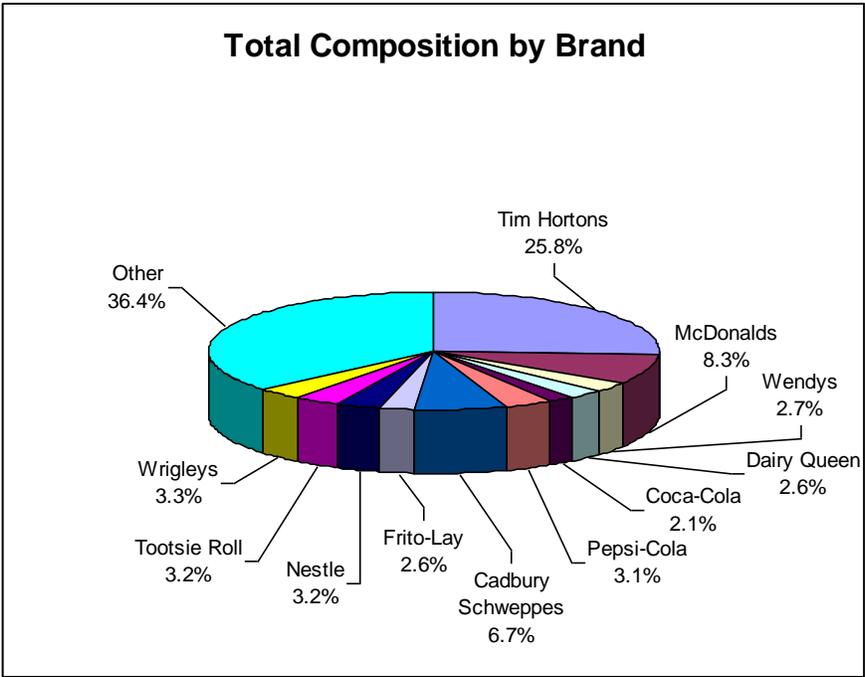


Figure 7. Identifiable litter composition by brand, excluding cigarette butts.

Quick Service Litter Composition

Quick Service Litter by Material

The majority (82%) of quick service litter consisted of composite materials and plastics, made up of items such as disposable cups, straws, and utensils. Paper food-wrap and paper bags also contributed to this category (Figure 8). Polystyrene and aluminum made up a small proportion of this litter, while materials such as glass and wood did not contribute at all to quick service litter.

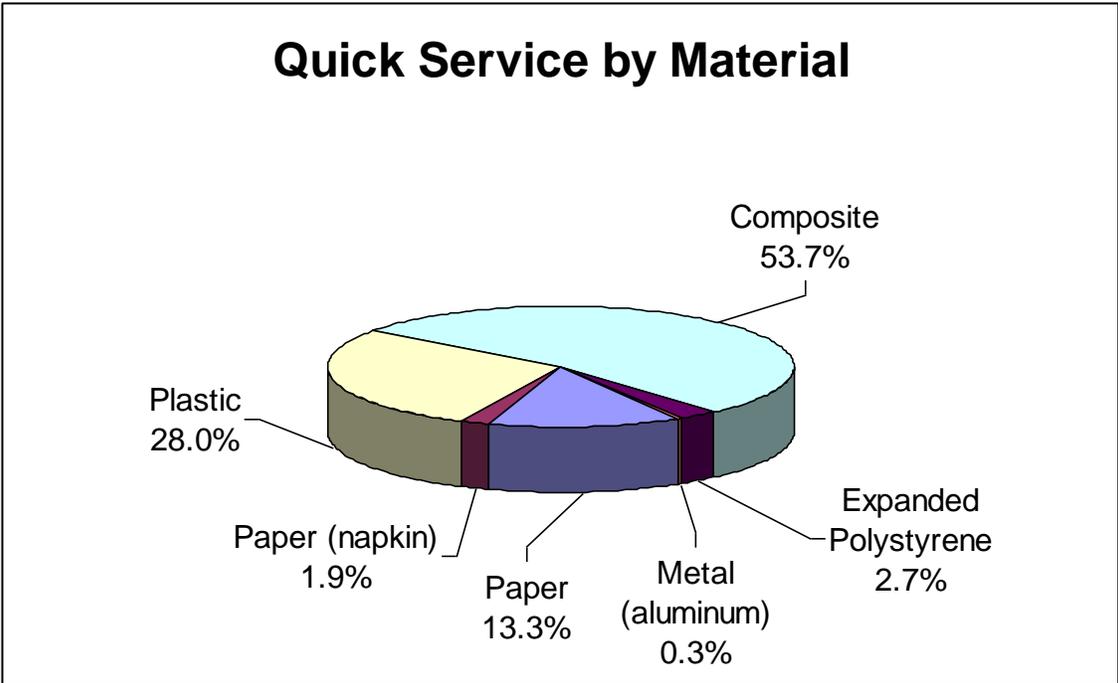


Figure 8. Quick service litter composition, by material.

Quick Service Litter by Brand

Brands could be distinguished for 84% of the quick service items collected (Figure 9). Tim Hortons products made up more than half of all identifiable quick service litter, followed by McDonalds and Wendys. Other brands included Dairy Queen, KFC, and Burger King.

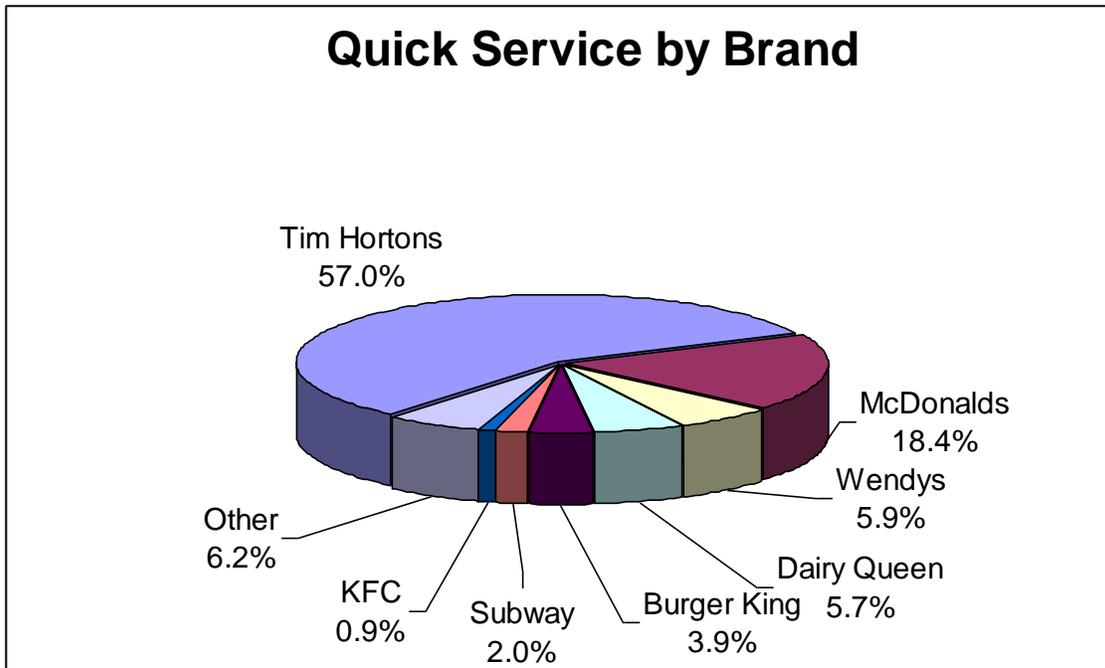


Figure 9. Quick service litter composition, by brand.

Snack Food Litter Composition

Snack Food Litter by Material

Snack food litter included items such as candy wrappers, bar wrappers and chip bags. Composite materials made up 63% of all snack food litter items collected, followed by paper at 15% and plastic materials at 14%. (Figure 10). Note that most composite materials include some form of plastic, such as chip bags.

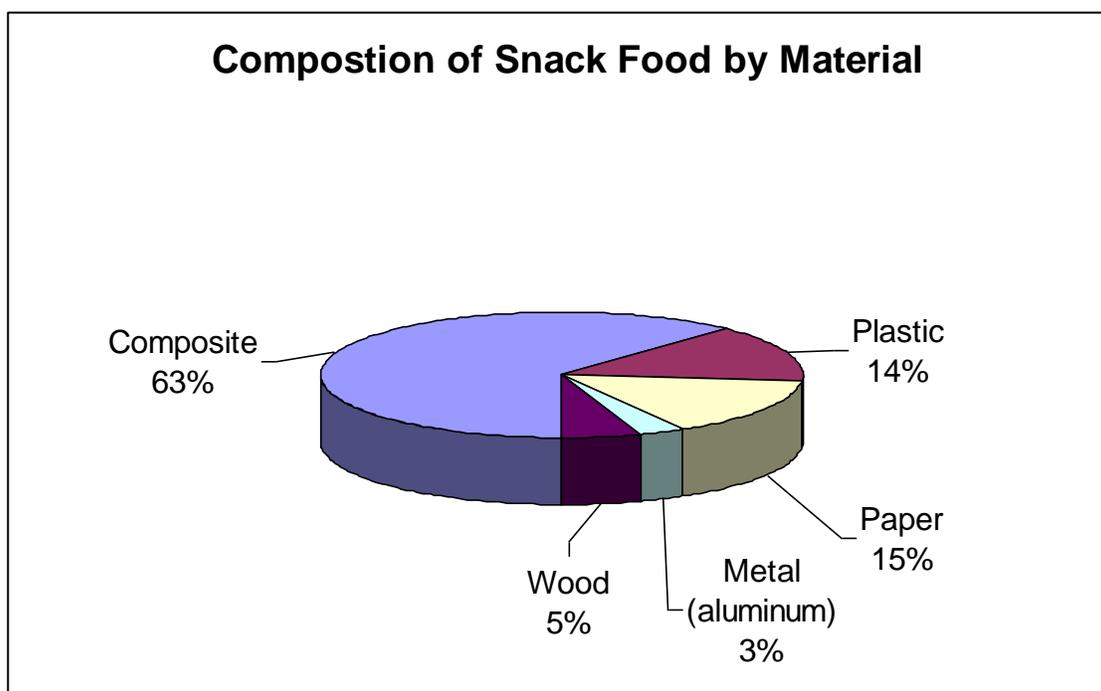


Figure 10. Snack food litter composition, by material.

Snack Food Litter by Brand

Brands could be distinguished for 75% of the snack food items collected. Cadbury was the most common snack food brand, followed by Wrigleys and Nestle (Figure 11). Other brands included Hershey, Mars, Frito-Lay, Dare, Storck, Unilever, and Humpty Dumpty. Unilever items included ice cream product brands such as Good Humour, Popsicle and Revello. Storck items included Campino and Werthers' brand candy wrappers.

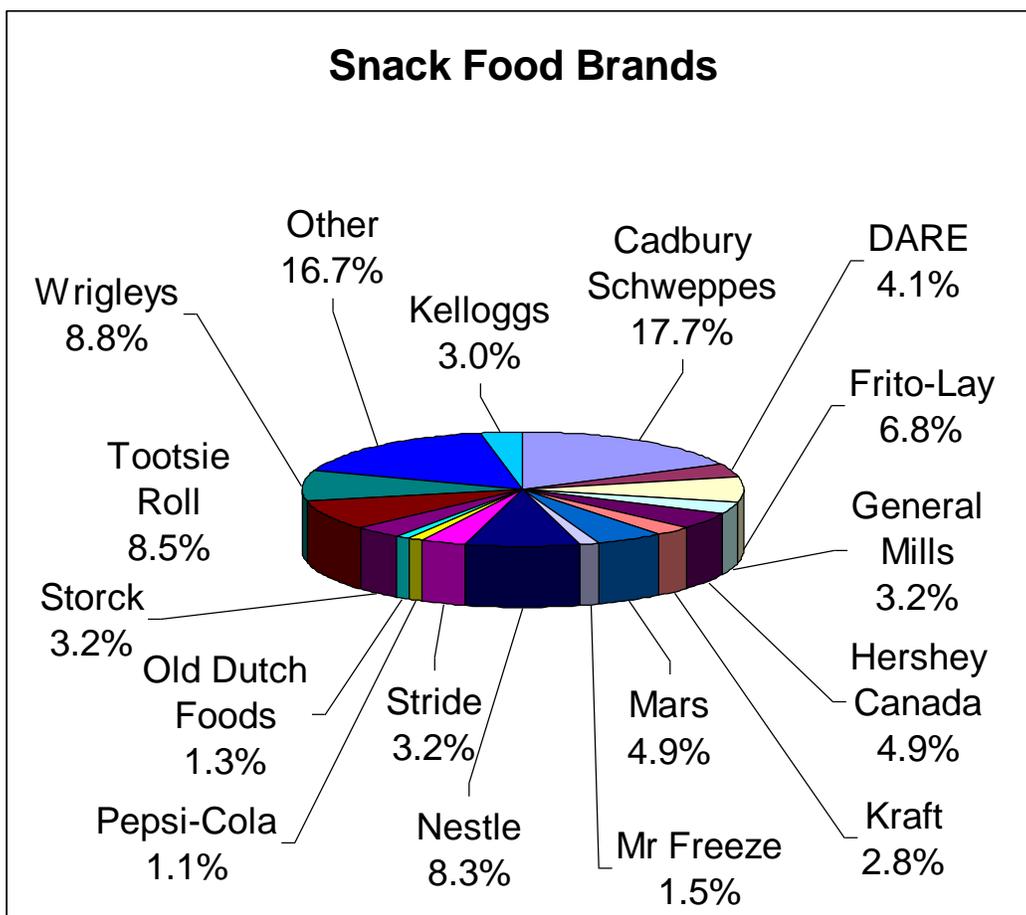


Figure 11. Snack food litter composition, by brand.

Tobacco Litter Composition

Tobacco Litter by Material

Composite materials, such as cigarette butts, matchbooks and lighters made up 95% of all tobacco litter (Figure 12). Cigarette butts accounted for the vast majority of composite materials. Plastic wrap from cigarette packaging made up 3%, followed by aluminum foil (1%) and paper packaging (0.5%) made up the remainder of this category.

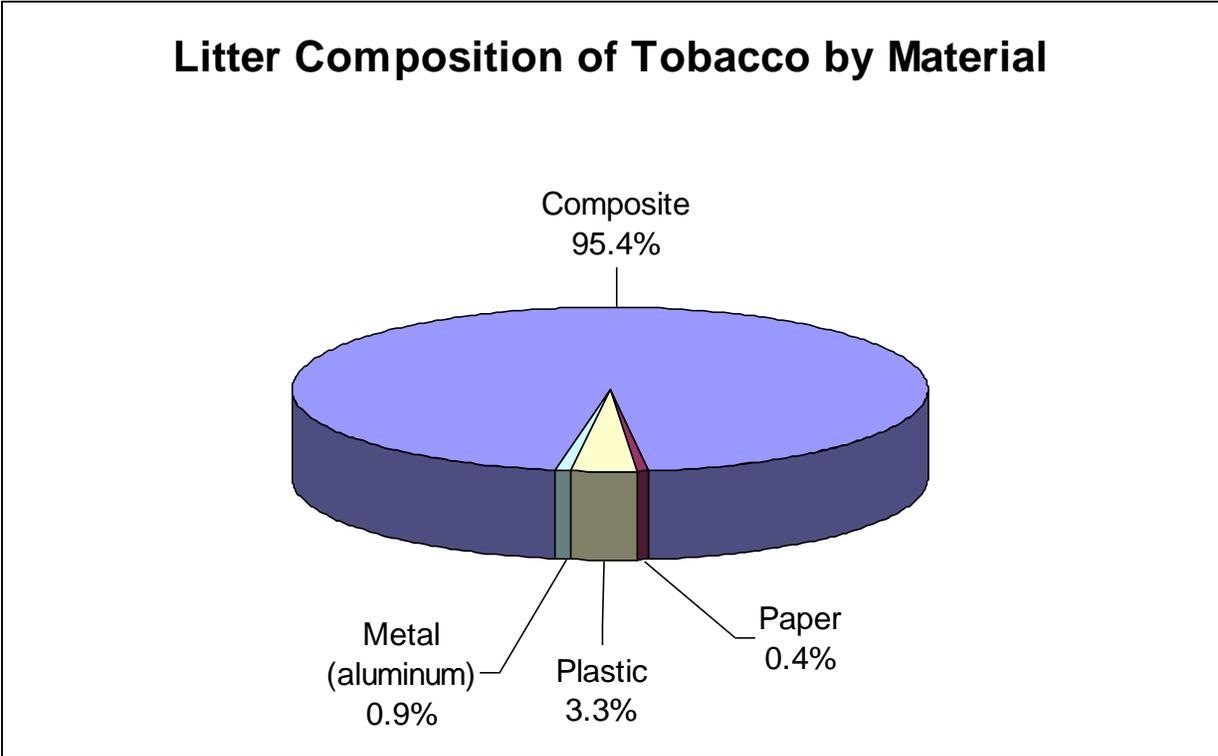


Figure 12. Tobacco litter composition, by material.

Tobacco Litter by Brand

Brands could be distinguished for only 48% of the tobacco products collected, since the majority of tobacco packaging consisted of unmarked butts, foil and plastic wrap. Canadian Classic, Players, and Peter Jackson were the most common brands of identifiable tobacco litter (Figure 13). Other brands included Number 7 and Belvedere.

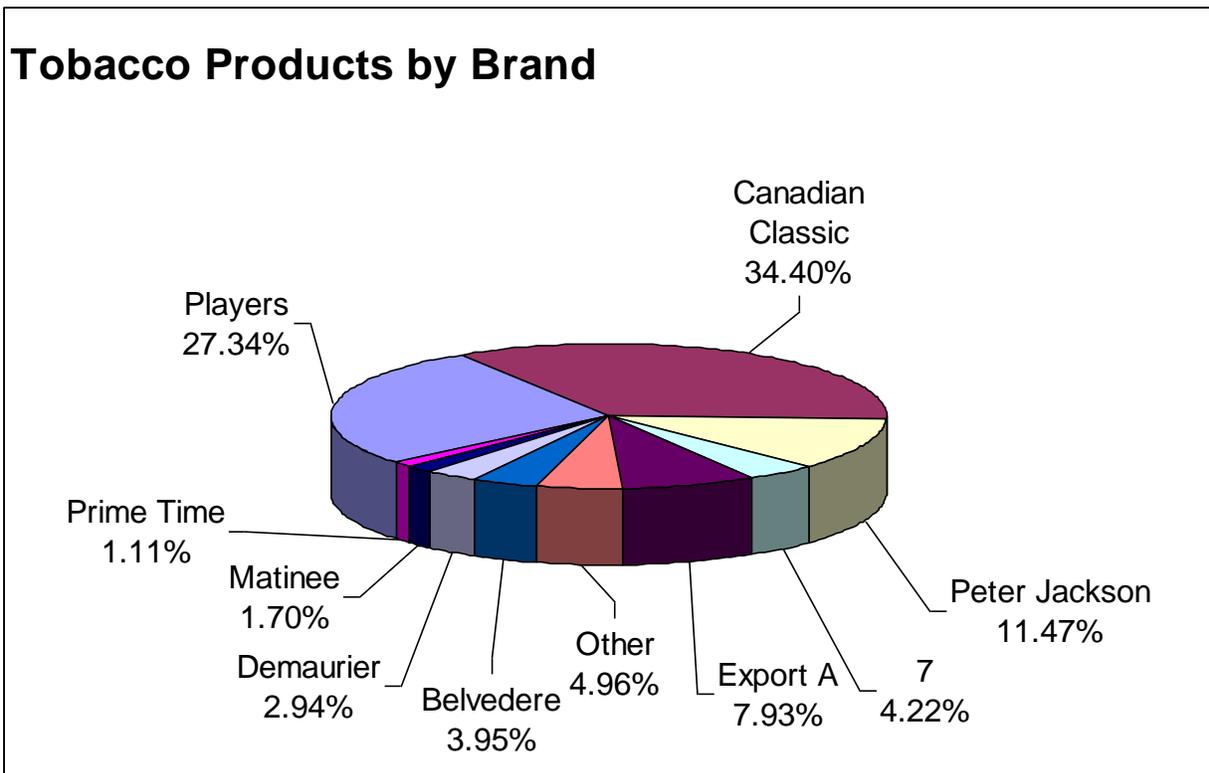


Figure 13. Tobacco litter composition, by brand.

Deposit and Milk Container Litter Composition

Deposit and Milk Container Litter by Material

Aluminum cans were the predominant type of drink container litter, with this material making up 63% of drink container litter (Figure 14). Plastic deposit containers and glass followed at 22% and 11% respectively.

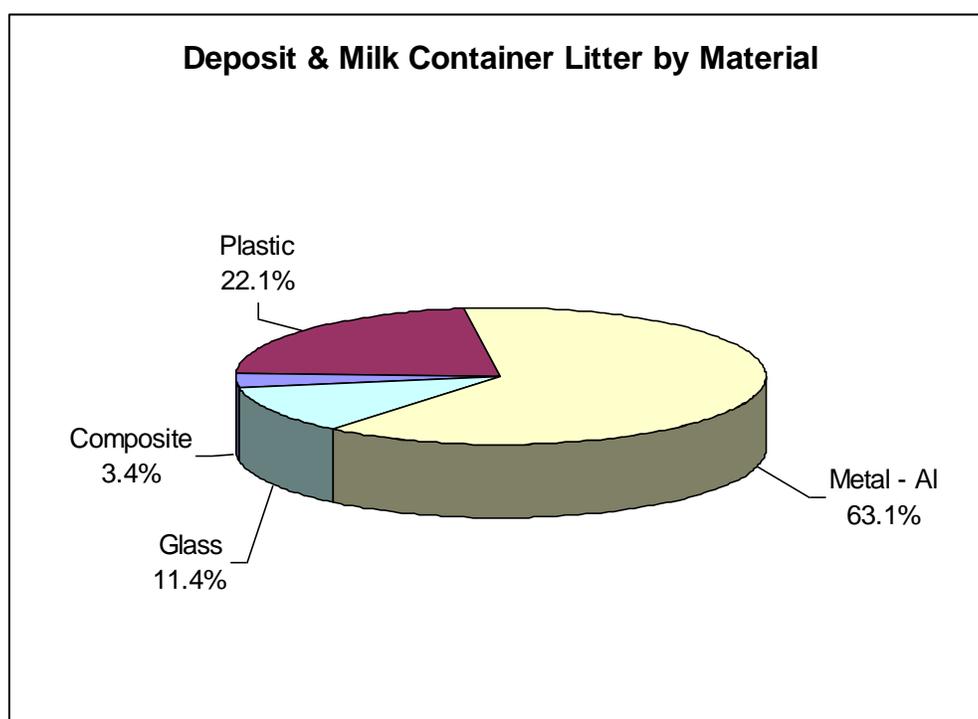


Figure 14. Deposit and Milk Container Litter, by material.

Deposit and Milk Container Litter by Brand

Brands could be distinguished for 75% of the deposit/milk container items collected (Figure 15). Pepsi (26.8%), Coke (21.1%), and Labatt (18.7%) were the most common brands. These three companies own several other brands of beverages (Appendix B). Other brands included Kraft, Tim Hortons, and Dole.

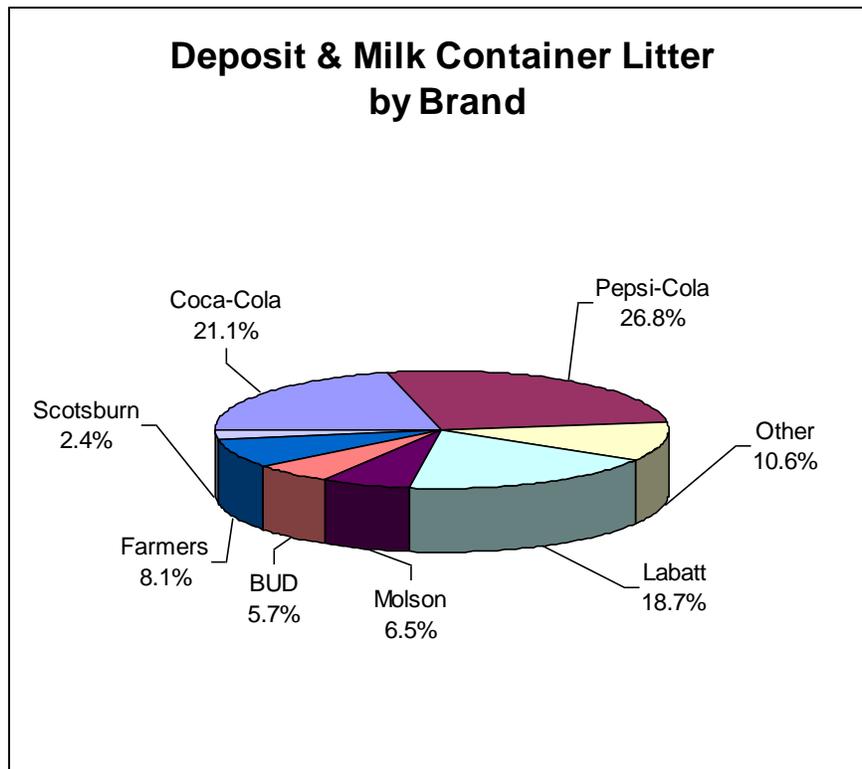


Figure 15. Deposit and milk container litter, by brand.

Grocery Litter Composition

Grocery Litter by Material

Plastic items (primarily grocery bags) made up 44% of all grocery product litter gathered (Figure 16). Paper also contributed significantly to grocery litter with items such as boxboard packaging and advertisements.

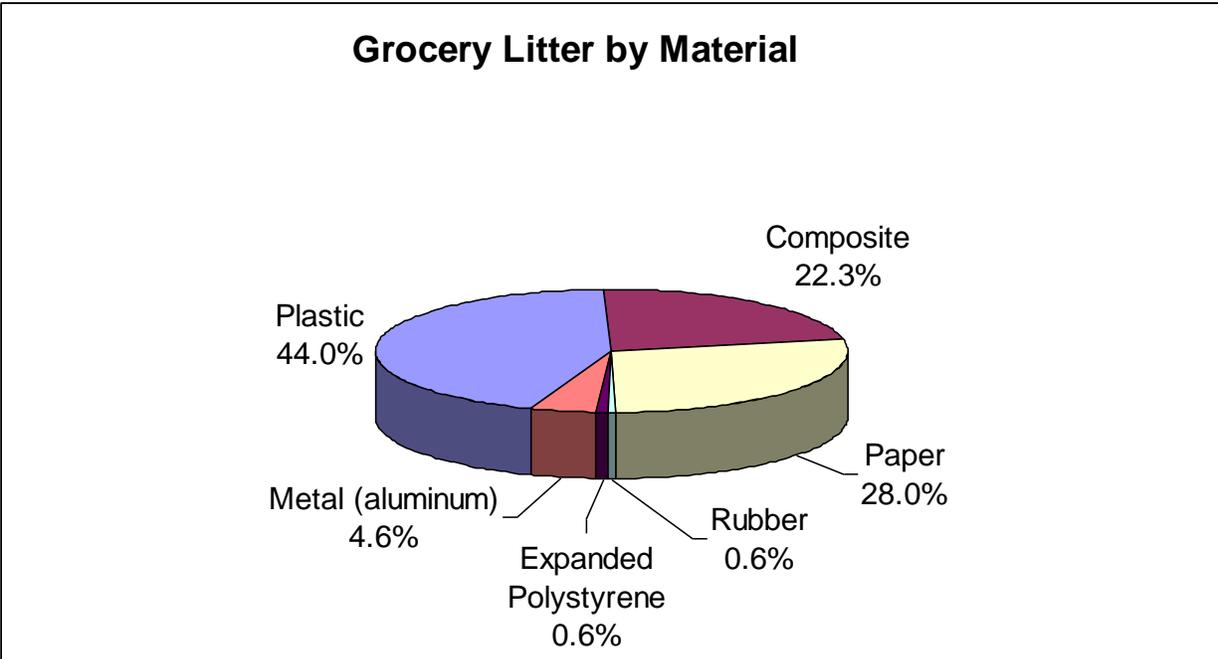


Figure 16. Grocery litter composition, by material.

Grocery Litter by Brand

Brands could be distinguished for 53% of the grocery items collected. Sobeys and Ziploc were the most common grocery store brands found, followed by Superstore and Wal-Mart. Other brands, included small quantities of grocery product brands. (Examples are McCains, Tide, Ben's, and White Swan).

Discussion

The data collected from this survey summarizes the characterization of litter in Nova Scotia in 2008, by material, source, and brand. Findings from this study give us a better understanding of the current litter problem in Nova Scotia. When results are compared with previous studies in Nova Scotia, overall trends in litter characterization can also be observed.

Comparison of Total Composition with Previous Studies in Nova Scotia

The relative proportion of litter source categories has changed slightly over the past 10 years (Figure 17). When total litter composition in 2008 is compared to that in 2004, litter sources were found to have a different rank, in terms of its contribution to total litter. For the first time snack food litter was found in greater amounts than quick service litter. In both 1998 and 2004, quick service was the primary source of litter, followed by snack food, tobacco, deposit/milk container, and grocery

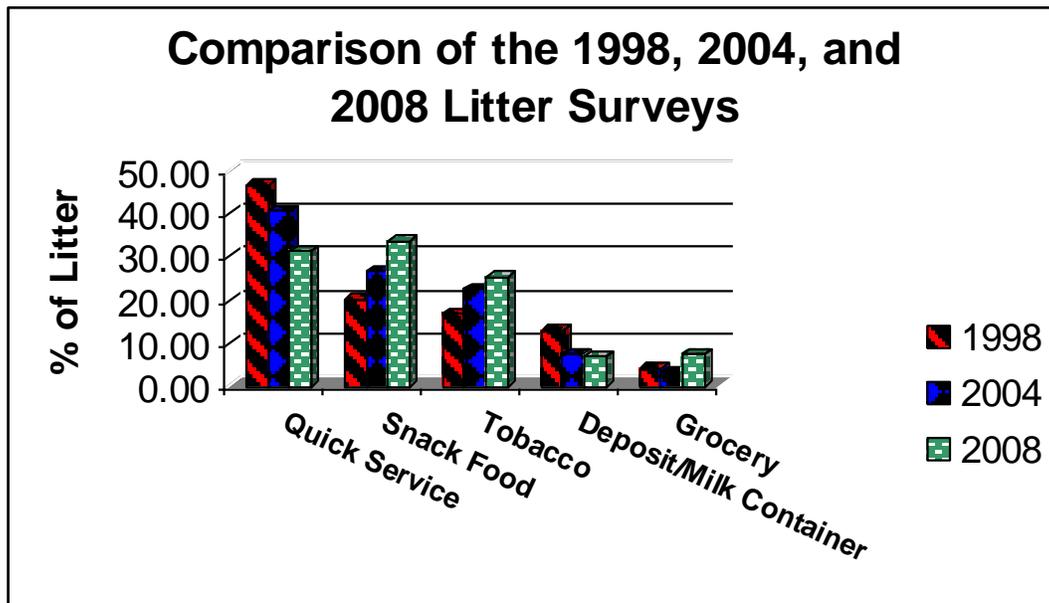


Figure 17. Comparison of the 1998, 2004, and 2008 litter surveys.

Comparing the 2008 litter study to studies in 1989, 1998, and 2004, the most significant change was observed in the category of deposit/milk containers. Between 1989 and 1998, there was a steep drop in deposit/milk containers, reflecting the success of the province's deposit-refund system in reducing this form of litter. Deposit/milk container litter continued to show a decrease in 2008, making up only 6.5% of litter, compared to 7.5% in 2004. Perhaps this further decrease reflects increased public awareness of the deposit-refund system.

In 2008, it was found that only three material categories made up 95% of all litter – plastics, paper and composites. Most composite items consisted of a combination of paper and plastic or foil and plastic. This is an important finding, since plastic and composite items present particular challenges in waste management. Both of these materials degrade extremely slowly (if at all), so that littered items remain in the environment for long periods of time. Furthermore, they are difficult to recycle. Some of Nova Scotia's municipal recycling programs do not accept all types of plastic (for example #3 through #7 containers). Similarly, most composite items, such as gum 'blister packs', chip bags and chocolate bar wrappers, are not recyclable.

While assessing branded items, it should be noted that store location in relation to the survey sites may contribute to the amount of branded material collected in this study. In addition it is unknown if the percentage of branded litter found correlates more closely to market share, or the type of item littered. This would be an interesting avenue to explore in future studies.

Litter Abatement Strategies

Recommendations

Litter abatement strategies should focus on three key areas:

- Education and Awareness
- Clean-up and monitoring
- Compliance and enforcement

The results from this study should help to give insight to the problem of litter and the possible ways that it can be abated. This study can be used as a source for statistics, research and as a reference for future studies.

Specific recommendations within these broad areas include an increase in the number of receptacles for waste, recycling, and organics, as well as focus on compliance efforts. Stewardship initiatives by industry are also encouraged.

Education and Awareness

In order to continue reducing the amount of litter along our roadways, education and awareness initiatives are vital. When people are aware of the nature of the litter problem, they are more likely to become interested in prevention. There is a strong tendency for people to feel that littering in certain circumstances is acceptable. A message needs to be delivered that littering is not an acceptable behavior. Litter is a problem, it is everyone's problem, and it is a problem that people can easily solve. A reduction in littering indicates a positive change in environmental behavior. Efforts to educate the public about littering may pave the way for future pro-environmental behavior and other environmental education activities.

Currently Nova Scotia Environment is in the process of developing a social marketing campaign to educate and create awareness around the issue of littering. This is an important first step towards reducing the amount of visible litter. In addition, more educational initiatives are required across a broad spectrum of audiences. This would include elementary through high school students, as well as members of the general public.

It is important to link littering education with proper waste diversion practices. Organizations like RRFB Nova Scotia work to promote correct waste management through education on re-using, reducing, and recycling or composting materials. An educational focus on how to properly sort waste should help reduce litter across the province.

Clean-up and monitoring

Continuous clean ups and monitoring of the problem are also essential in order to keep records of any progress that is made in reducing litter. Clean-up programs, such as The Great Nova Scotia Pick Me Up, and the Adopt-a-Highway Program have been important in reducing the amount of litter in our province. In 2007, these two programs alone collected over 8,000 bags of garbage across Nova Scotia. The province must continue to support these types of programs, and similar clean up initiatives.

A commonly overlooked component of clean-up is the presence of receptacles for potential litter items. Many areas visited throughout the study did not provide accessible garbage or recycling containers, and this appears to reflect the situation throughout the province. A representative of the Tourism Industry Association of Nova Scotia noted that a lack of waste receptacles is a common complaint from tourists who visit the province.

“Cigarette butt stops” are also recommended, particularly in urban downtown areas. Cigarette butts were observed in significant numbers in the course of this study, yet butt stops were rarely observed. As easy as it is to throw a butt to the ground, the presence of a disposal container

would likely reduce this practice. As part of the “Kick Butt” Campaign, Clean NS in partnership with the NSYCC conducted a 2008 survey of smokers in the HRM. About 85% of respondents indicated they threw butts on the ground because there was no accessible receptacle, and that 90% would use a receptacle if one was available.

In the case of urban litter, municipalities should ensure that receptacles for waste, recyclables, and organics are placed in convenient locations, and at frequent intervals, particularly in downtown areas. In addition to placing receptacles, municipalities should ensure they are well designed and regularly emptied to encourage the use of these bins. Rural areas, which attract visitors, also must have proper waste management bins in place.

Monitoring is vital to understanding the state of litter in the province, and to evaluate efforts to reduce litter. A fresh litter count has never been conducted in the province, and it is recommended that in 2009 all sites from the 2008 litter survey are re-visited to determine the fresh litter accumulation. Additional information should be collected such as individual item counts and weight or volume of refuse collected from each site. Other sites such as parks and common gathering areas should be added to the litter survey and assessment to get a base line for litter accumulation in high use areas. Monitoring should also include tracking of refuse collected from other sources and clean-ups, including increases and decreases in volume.

Compliance and Stewardship

Compliance with the province’s litter laws is also an important part of litter reduction. Compliance is often a challenge, particularly when municipalities and provincial authorities do not have the resources to focus on litter offenders. It is costly and difficult to pursue offenders. However, litterers may think twice about tossing their trash into our environment if the risk of a fine was real.

A closer evaluation of litter compliance practices in different jurisdictions, with a focus on Canadian solutions, should be undertaken. This information would provide a valuable resource to assess our current compliance practices, and determine if there is a more effective model which would fit with our current structure and resources.

It is also recommended that private industry take more initiative towards abating litter. Anti-litter campaigns are a good start, but further action is needed. Some actions could be as simple as providing source separation containers outside their place of business, or business owners could sponsor 'downtown initiatives' like clean ups and placement of receptacles on city/village streets. It is vital that any receptacles placed be "user friendly", and include compartments to properly sort waste.

Most litter collected in the 2008 litter survey was packaging from a consumer product. One possible stewardship initiative could be to reduce packaging at the source. Instructively, less packaging would lead to less material available to litter, and in turn less litter on the ground. In addition, this type of stewardship program would help reduce the amount of waste going to landfill. Other stewardship initiatives such as deposit or recycling options for products can also help reduce litter. This is evidenced by the dramatic drop in littered beverage and milk containers since the implementation of the deposit refund system and the milk container stewardship agreement in Nova Scotia. Other industries could explore similar options for their products.

Appendix A: Survey Sites and Directions

Yarmouth County

9. Main Street, Yarmouth. - July 16

- Take HWY- 102 N (BiHigh), take exit 1A merge onto HWY 103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Turn right at HWY-103/ River Rd- continue to follow HWY-103
- Turn left at HWY-101- turn right at HWY-101/ HWY-3/ Lighthouse Rte/ Starrs Rd
- Turn left at Evangeline Trail/ HWY-1/ Main St
- Start A: N43 50.649' W066 07.077'- End A: N43 50.687' W066 07.041'
- Start B: N43 50.633' W066 07.064'- End B: N43 50.667' W066 07.040'

Shelburne County

8. Sable River, Intersection of Highway 3 and East Sable Road. - July 16

- Take HWY- 102 N (BiHigh), take exit 1A merge onto HWY 103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Turn right at HWY-103/ River Rd- continue to follow HWY-103
- HWY- 103 turns into HWY-3
- Turn left onto East Sable Rd
- Start A: N43 50.468' W065 03.100'- End A: N43 50.413' W065 03.117'
- Start B: N43 50.415' W065 03.122'- End B: N43 50.471' W065 03.120'

Queen's County

7. Middlefield, 500m NW of Intersection of Highway 8 and 210. - July 16

- Take HWY-102 N (BiHigh)- Take exit 1A to merge onto HWY-103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Take Liverpool exit to HWY-8 NW
- Continue down HWY-8 until intersection of HWY-210 and HWY-3 is met
- Start A: N44 12.003' W064 50.790'- End A: N44 12.024' W064 50.855'
- Start B: N44 12.019' W064 50.861'- End B: N44 11.998' W064 50.793'

Lunenburg County

4. Mahone Bay, 325 and Clearway Street. - July 14

- Take HWY-102 N (BiHigh)- Take exit 1A to merge onto HWY-103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Take exit 10 toward HWY-3/ Mahone Bay/ Lunenburg
- Continue straight- turn right at HWY-3/ Lighthouse Route
- Continue on HWY-325
- Start A: N44 27.040' W064 23.333'- End A: N44 27.089' W064 23.301'

- Start B: N44 27.089' W064 23.306'- End B: N44 27.042' W064 23.341'

5. Bridgewater, 325 and Pearl Road. - July 14

- Take HWY-102 N (BiHigh)- Take exit 1A to merge onto HWY-103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Take exit 13 for HWY-325 toward HWY-331/ Baker Sett. / Wileville/ Bridgewater
- Turn left at HWY-325- Turn left at Pearl Street
- Start A: N44 22.363 W064 32.162'- End A: N44 22.399' W064 32.106'
- Start B: N44 22.361' W064 32.155'- End B: N44 22.394' W064 32.097

6. Rose Bay, Intersection of Highway 332 and Kingsburg Road. - July 14

- Take HWY-102 N (BiHigh)- Take exit 1A to merge onto HWY-103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Take exit 11 for HWY-324 toward HWY-325/ Mahone Bay/ Blockhouse/ Lunenburg
- Turn left at Cornwall Rd/ HWY-324- continue to follow HWY-324
- Turn right at HWY-332
- Turn right at Indian Path Rd- do NOT continue on Fish Peddler Rd- Continue on Kingsburg Rd only (google maps will give you this direction- Fish Peddler Rd is a dead end)
- Start A: N44 17.892' W064 18.310'- End A: N44 17.840' W064 18.288'
- Start B: N44 17.839' W064 18.293'- End B: N44 17.893' W064 18.316'

Annapolis County

10. Bridgetown, Highway 1 and Inglewood Road. - July 17

- Take Angus L MacDonald Bridge- continue on Nantucket Ave.
- Turn Left at Victoria Rd, slight right at Windmill Rd- Take the ramp to HWY-101/ HWY-1/ LR. Sackville/ Windsor
- Take exit 21 towards HWY-1 West
- Continue on HWY-1 until intersection with Inglewood Rd is met
- Start A: N44 50.627' W065 17.781'- End A: N44 50.676' W065 17.813'
- Start B: N44 50.675' W065 17.817'- End B: N44 50.625' W065 17.789'

11. West Dalhousie, Intersection of West Dalhousie and Morse Road. - July 17

- Take Angus L MacDonald Bridge- continue on Nantucket Ave.
- Turn Left at Victoria Rd, slight right at Windmill Rd- Take the ramp to HWY-101/ HWY-1/ LR. Sackville/ Windsor
- Take exit 20 (Bridgetown)- continue West on HWY-1
- Left on Morse Rd, continue until West Dalhousie Rd is met
- Start A: N44 43.138' W065 13.530'- End B: N44 43.122' W065 13.456'
- Start B: N44 43.140' W065 13.531'- End B: N44 43.124' W065 13.457'

Kings County

- 12. Greenwood, Intersection of Highway 201 and Rocknotch Road. - July 17**
- Take Angus L MacDonald Bridge- continue on Nantucket Ave.
 - Turn Left at Victoria Rd, slight right at Windmill Rd- Take the ramp to HWY-101/ HWY-1/ LR. Sackville/ Windsor
 - Take exit 16 toward Victoria Harbour Rd/ Aylesford/ Auburn
 - Turn left at Victoria Rd- slight right toward HWY-201
 - Continue on HWY-201 until Rocknotch Rd is met
 - Start A: N44 57.938' W064 55.280'- End A: N44 57.891' W064 55.251'
 - Start B: N44 57.940' W064 55.275'- End B: N44 57.891' W064 55.246'
- 13. South Alton, Intersection of HWY- 12 and English Mountain Road. - July 18**
- Take MacDonald Bridge- continue on Nantucket, turn left at Victoria Rd, slight right at Windmill Rd.
 - Take HWY-101/ HWY-1/ LR. Sackville/ Windsor going West
 - Take exit 13 for HWY-12 toward North/ South Alton/ Kentville/ New Ross- continue to follow HWY-12
 - Turn right at English Mountain Rd. (Survey English Mountain Rd.)
 - Start A: N45 01.334' W064 32.262'- End A: N45 01.328' W064 32.184'
 - Start B: N45 01.332' W064 32.184'- End B: N45 01.341' W064 32.262'
- 14. Centreville, Intersection of HWY- 221 and HWY- 359- July 18**
- Take MacDonald Bridge- continue on Nantucket, turn left at Victoria Rd, slight right at Windmill Rd.
 - Take HWY-101/ HWY-1/ LR. Sackville/ Windsor going West
 - Take exit 11 toward Greenwich/ Port Williams/ Canning/ HWY-1/ HWY-358
 - Turn right at Access Rd- Turn right at Evangeline Trail/ HWY-1
 - Turn left at HWY-358- Turn left at Church St- Turn right at HWY-341/ Upper Dyke Rd
 - Turn left at Reid Rd- Turn right at HWY-359
 - Start A: N45 08.110' W064 31.745'- End A: N45 08.152' W064 31.696'
 - Start B: N45 08.157' W064 31.700'- End B: N45 08.118' W064 31.753'
- 15. Kentville, 500m up Highway 1 from Highway 12- July 18**
- Take MacDonald Bridge- continue on Nantucket, turn left at Victoria Rd, slight right at Windmill Rd.
 - Take HWY-101/ HWY-1/ LR. Sackville/ Windsor going West
 - Take exit 12 toward New Minas/ Kentville/ HWY-1
 - Turn right at New Rd- Turn Left at Commercial St/ HWY-1- continue following HWY-1 until reach intersection with HWY-12
 - Start A: N45 04.783 W064 29.678'- End A: N45 04.735 W064 29.649'
 - Start B: N45 04.763' W064 29.662'- End B: N45 04.781' W064 29.688'
- 16. Wolfville, Highway 1 and Dyke Road. - July 18**
- Take MacDonald Bridge- continue on Nantucket, turn left at Victoria Rd, slight right at Windmill Rd.

- Take HWY-101/ HWY-1/ LR. Sackville/ Windsor going West
- Take exit 10 toward HWY-1/ Grand Pre/ Wolfville
- Merge onto Evangeline Trail/ HWY-1- travel ~3 km until intersection with Dyke Rd is met.
- Start A: N45 05.878' W064 19.529'- End A: N45 05.900' W064 19.599'
- Start B: N45 05.902' W064 19.995'- End B: N45 05.883' W064 19.530'

Halifax County

1. Brookside, Intersection of Brookside Road and Mitchell Drive. - July 9

- Follow Quinpool Rd until the Rotary- take the 3rd exit onto St. Margaret's Bay Rd
- Turn left at Brookside Rd- continue for ~ 2. 8 km until Mitchell Rd is reached
- Start A: N44 32.417' W063 42.852'- End A: N44 32.452' W063 42.799'
- Start B: N44 32.414' W063 42.850'- End B: N44 32.451' W063 42.792'

2. Shad Bay, Intersection of Highway 333 and Terrence Bay Road. - July 11

- Take Quinpool to the Rotary, take the 3rd exit onto St Margaret's Bay Rd
- Turn left at HWY-333/ Prospect Rd- follow for ~16. 7 km until in Shad Bay is reached
- Continue following HWY-333 until intersection with Terrence Bay Rd is reached
- Start A: N44 31.693' W063 45.551'- End A: N44 31.720' W063 45.550'
- Start B: N44 31.690' W063 45.554'- End B: N44 31.722' W063 45.561'

3. West Dover, Intersection of Highway 333 (Private Drive) and West Dover Road- July 11

- Take Quinpool to the Rotary, take the 3rd exit onto St Margaret's Bay Rd
- Turn left at HWY-333/ Prospect Rd- follow for ~32. 5 km until intersection of HWY-333 and W Dover Rd is reached.
- Start A: N44 29.455' W063 52.250'- End A: N44 29.454' W063 52.248'
- Start B: N44 29.505' W063 52.244'- End B: N44 29.501' W063 52.239'

18. Yankeetown, Intersection Highway 213 and Yankeetown Road. - July 24

- Take HWY-102 N/ Bicentennial Dr
- Take exit 1A to merge onto HWY-103 W toward HWY-3/ Yarmouth/ HWY-333/ South Shore/ Peggy's Cove
- Take exit 5 for Hammonds Plains Rd/ HWY-213- follow HWY-213 for ~4. 2km until intersection with Yankeetown Rd is reached
- Start A: N44 43.647' W063 49.029'- End A: N44 43.681' W063 48.970'
- Start B: N44 43.685' W063 48.978'- End B: N44 43.653' W063 49.028'

19. Sackville, Intersection of Highway 324 and Old Sackville Road. - July 24

- Take MacDonald Bridge- continue on Nantucket, turn left at Victoria Rd, slight right at Windmill Rd.
- Take HWY-101/ HWY-1/ LR. Sackville/ Windsor going West

- Take exit 2 to merge onto Beaverbank Connector/ HWY-354 toward Mid Sackville/
Beaver Bank Rd
 - Turn right at Old Sackville Rd
 - Start A: N44 46.182' W063 41.837'- End A: N44 46.147' W063 41.785'
 - Start B: N44 46.153' W063 41.778'- End B: N44 46. 189' W063 41.824'
- 20. Bedford, Intersection of Highway 2 and Meadowbrook Drive. - July 24**
- From Barrington St take ramp to HWY-102/ HWY-2/ Windsor St/ Robie St- merge onto HWY-111 South
 - Turn right at Kempt Rd- Continue on Bedford Highway
 - Turn left at Meadowbrook Drive
 - Start A: N44 43.501' W063 40.129'- End A: N44 43.471' W063 40.178'
 - Start B: Not taken - End B: N44 43.460' W063 40.177'
- 21. Halifax, Intersection of Dutch Village Road and Deal Street. - July 30**
- From Barrington St take ramp to HWY-102/ HWY-2/ Windsor St/ Robie St- merge onto HWY-111 South
 - Turn right at Kempt Rd- slight right onto the ramp to Joseph Howe Dr/ HWY-102/
HWY-3/ Armdale Rotary- merge onto Joseph Howe Dr
 - Slight right at Dutch Village Road- slight left to stay on Dutch Village, turn left to stay on
Dutch Village- follow Dutch Village until intersection with Deal Street. (Survey Dutch
Village- should be in front of a pub with many old men.)
 - Start Point: N44 65.807' W063 63.098'
- 22. Halifax, 1km up Herring Cove Road from the Rotary. - July 31**
- Take Spring Garden to Robie- From Robie turn left at Quinpool- follow Quinpool until
Halifax Rotary.
 - Got through the Rotary take the Herring Cove Rd exit. Follow Herring Cove Rd for
~1km or after the guardrail. (Should start near houses/ apt. buildings- 2 bus stops)
 - Start A: N44 37.960' W063 37.121'- End A: N44 37.91' W063 37.119'
 - Start B: N44 37.910' W063 37.106'- End B: N44 37.962' W063 37.100'
- 23. Halifax, Intersection of Highway 3 and Quarry Road. - July 31**
- Take Spring Garden to Robie.
 - Turn left onto Quinpool- follow Quinpool until Armdale Rotary
 - Take 3rd exit onto St Margaret's Bay Rd
 - Follow St Margaret's Bay Rd for ~1km until intersection with Quarry Rd
 - Start: N44 38.231' W063 37.819'
 - End: N44 38.185' W063 37.948' (only 1 side of roadway, so 200m on one side because of
guardrail- too dangerous to do both sides.)
- 24. Halifax, Intersection of South Street and Oxford. - July 10**
- Intersection South Street and Oxford Rd.
 - Take South St until intersection with Oxford

- Start A: N44 38.040' W063 35.702'- End A: N44 38.024' W063 35.693'
- Start B: N44 38.024' W063 35.693'- End B: N44 38.057' W063 35.666'
- Start C: N44 38.067' W063 35.708'- End C: N44 38.065' W063 35.669'
- Start D: N44 38.062' W063 35.709'- End D: N44 38.021' W063 35.702'

25. Halifax, Intersection of North Street and Windsor Street. - July 10

- Intersection North and Windsor
- Take Robie to North Street, turn left onto North, follow North until intersection with Windsor is met.
- Start A: N44 39.131' W063 35.913'- End A: N44 39.094' W063 35.968'
- Start B: N44 39.085' W063 35.957'- End B: N44 39.113' W063 35.912'

26. Dartmouth, Intersection Portland Street and Old Ferry Road. - July 25

- Take Barrington St to MacDonald Bridge
- Turn right coming off of Bridge onto Wyse Rd
- From Wyse Rd continue onto Windmill Rd
- Continue on Alderney Drive- At intersection turn Right onto Portland St
- Follow Portland until intersection with Old Ferry Rd
- Start A: N44 40.071' W063 33.199'- End B: N44 40.078' W063 33.128'
- Start B: N44 40.087' W063 33.125'- End B: N44 40.088' W063 33.127'

27. Dartmouth, 100m down Wyse Road from Nantucket. - August 6

- Right in front of the Sportsplex
- Take Barrington St to MacDonald Bridge
- Turn right coming off of Bridge onto Wyse Rd
- (You can park at the back of the Sportsplex in their parking lot, it should be ok, as long as you don't stay too long.)
- Start A: N44 38.750' W063 20.214'- End A: N44 40.135' W063 34.517'
- Start B: N44 40.152' W063 34.588'- End B: N44 40.120' W063 34.533'

28. Cole Harbour, Intersection of Cole Harbour Road and Forest Hill Parkway. - July 25

- Take MacDonald Bridge to Dartmouth
- Turn right at Wyse Rd, Turn left at Windmill Rd, Continue on Alderney Dr until Portland St. Continue on Portland St until it turns into Cole Harbour Rd
- Continue on Cole Harbour Rd/ HWY-207 until intersection with Forest Hills Parkway is met.
- Start A: N44 40.317' W063 29.325'- End A: N44 40.327' W063 29.249'
- Start B: N44 40.323' W063 29.247'- End B: N44 40.304' W063 29.326'

29. Lawrencetown, Intersection of Highway 207 and Leslie Road. - August 6

- Take MacDonald Bridge to Dartmouth
- Turn right at Wyse Rd, Turn left at Windmill Rd, Continue on Alderney Dr until Portland St. Continue on Portland St until it turns into Cole Harbour Rd

- Continue on Cole Harbour Rd/ HWY-207
 - Turn Left at Leslie Rd (survey HWY-207)
 - Start A: N44 38.754' W063 20.125'- End A: N44 38.750' W063 20.215'
 - Start B: N44 38.750' W063 20.133'- End B: N44 38.746' W063 20.210'
- 30. Dartmouth, Intersection of Highway 7 and Akerley Blvd. - August 8**
- Take MacDonald Bridge to Dartmouth
 - Continue on Nantucket Ave
 - Turn left at Victoria Rd, follow for ~3. 2km- slight right at Windmill Rd, follow for ~1. 4km
 - Turn Right at Akerley Blvd
 - Start A: N44 35.198' W065 49.049' (?) - End A: N44 42.266' W063 36.649'
 - Start B: N44 42.225' W063 36.718'- End B: N44 42.269' W063 36.675'
- 41. Moosehead, Intersection of Highway 7 and Stan Gammon Loop. - July 23**
- Take MacDonald Bridge to Dartmouth
 - Turn right at Wyse Rd, Turn left at Windmill Rd
 - Turn left at Ochterloney St- slight Left at Prince Albert Rd
 - Continue on Grahams Grove
 - Take the Main St/ HWY-111 S/ HWY-7 E ramp to Cole Harbour/ Eastern Passage
 - Keep left at the fork, follow signs for HEY-7 E and merge onto HWY-7/ Main St- Continue to follow HWY- 7 for ~8. 6 km until it turns into HWY-107
 - Continue following HWY-107 for ~24. 8km
 - Turn right at HWY-7/ Marine Dr- follow for ~101km until Stan Gammon Loop is reached.
 - Start A: N44 56.256' W062 16.159'- End A: N44 56.300' W062 16.127'
 - Start B: N44 56.258' W062 16.167'- End B: N44 56.304' W062 16.129'
- 43. Dean, Intersection of Highway 336 and Dean Back Road. - July 23**
- Take MacDonald Bridge to Dartmouth
 - Continue on Nantucket Ave, turn left at Victoria Rd
 - Turn right at HWY-118/ Woodland Ave- continue to follow HWY-118 for ~ 16km
 - Take the exit onto HWY-102 N towards the Airport
 - Take exit 5A toward aerotech business park- merge onto HWY-212
 - Turn left at Pratt Whitney Dr
 - Turn right at HWY-212/ Old Guysborough Rd- follow for ~29. 8km
 - Turn left at HWY-357- follow for ~11. 8km
 - Continue straight onto HWY-224- follow for ~19. 4km, than continue on HWY-336 for about 8. 4km until Dean Back Rd is reached.
 - Start A: N45 09.528' W062 54.486'- End A: N45 09.494' W062 54.541'
 - Start B: N45 09.490' W062 54.539' - End B: N45 09.526' W062 54.480'
- 44. Chaswood, 100m in on Lower Stewiacke Road. - July 23**
- Take MacDonald Bridge to Dartmouth

- Continue on Nantucket Ave, turn left at Victoria Rd
- Turn right at HWY-118/ Woodland Ave- continue to follow HWY-118 for ~ 16km
- Take the exit onto HWY-102 N towards the Airport
- Take exit 11 toward Stewiacke/ HWY-2/ Alton
- Turn right at Main St West, take a slight right, Turn right onto Lower Stewiacke Rd
- Start A: N45 02.781' W063 13.128'- End A: N45 02.835' W063 13.167'
- Start B:N45 02.834' W063 13.169' - End B: N45 02.786' W063 13.132'

Colchester County

31. **Upper Rawdon, Intersection of Highway 354 and Renfrew Road. - July 29**

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards the airport
- Take exit 8 for HWY-214 toward Lantz/ Elmsdale/ Windsor- turn left at HWY-214, follow for ~6. 4 km- turn right to stay on HWY-214
- Turn Left at HWY-14- continue on HWY-14 for ~ 17. 1 km
- Turn left onto HWY-354 and continue on until intersection with Renfrew Rd is met.
- Coordinate Points: N45 04.03' W063 42.42' (No GPS for this site)

32. **Truro, Intersection of Queen Street and Lorne Street. - July 29**

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards the airport
- Take exit 13 toward Truro/ HWY-2
- Merge onto Connector Rd- continue on McClures Mills Rd
- Turn left at HWY-2/ Willow St- continue following Willow St
- Turn right at Queen St. (Park in Church lot)
- (To be safe try exit 14, there were some problems with these directions)
- Coordinate Points: N45 21.54' W063 16.48' (no GPS for this site)

33. **East Mapleton, ~2. 5km down Lynn Road from Highway 2. - July 28**

- From Halifax, travel on Provincial HWY-102
- At Truro, travel West on the Trans Canada HWY-104W
- Take exit 5 and travel South West on HWY-142 for ~6-7km
- Turn left on HWY-2 and continue for ~12km (travel through Springhill)
- Start A: N45 33.484' W064 07.183'- End A: N45 33.525' W064 07.256'
- Start B: N45 33.527' W064 07.258'- End B: N45 33.509' W064 07.205'

Cumberland County

34. **Amherst, Intersection of Highway 2 and Crescent Avenue. - July 28**

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118

- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 W/ Trans Canada HWY exit
- Take exit 4 for HWY-2/ South Albion St toward Amherst/ Springhill
- Turn right at Albion St South
- Turn left at Fullerton Ave- follow for ~0. 2km until Crescent Ave is reached
- Start A: N45 49.895' W064 12.575'- End A: N45 49.881' W064 12.618'
- Start B: N45 49.861' W064 12.618'- End B: N45 49.894' W064 12.566'

35. Wentworth, 1km past intersection of Highway 4 and Highway 307

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 W/ Trans Canada HWY exit
- Take exit 11 for Hwy-4 toward Wentworth/ Folly Lake/ HWY-2
- Turn left at HWY-4- follow for ~29. 8km
- Start A: N45 40.421' W063 33.255'- End A: N45 40.367' W063 33.240'
- Start B: N45 40.366' W063 33.249'- End B: N45 40.420' W063 33.274'

Guysborough County

40. Guysborough, Intersection of Old Riverside Road and Tompkinville Drive. - July 30

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 E/ Trans Canada HWY exit toward New Glasgow/ Cape Breton/ PEI Ferry Caribou
- Take the HWY-4 E exit (37) toward Monastery/ E Tracadie/ Guysborough
- Turn left at HWY-4, slight right at HWY-16
- Continue on HWY-16 until intersection with Old Riverside Dr
- Follow Old Riverside Rd until intersection with Tompkinville Dr
- (Place to park on Old Riverside Rd- look-off point.)
- Start A: N45 23.666' W061 30.218'- End A: N45 23.620' W061 30.178'
- Start B: N45 23.618' W061 30.182'- End B: N45 23.650' W061 30.213'

42. Cameron Settlement, 250m in on Cameron Settlement Road. - July 30

- From Halifax, travel on HWY-102 to HWY-104E Trans Canada HWY
- Take HWY-104E exit 24 to HWY-374 South
- Take HWY-374 until intersection with Cameron Settlement Road ~40km from exit 104
- 250m in on Cameron Settlement Road
- Start A: N45 17.105' W062 31.889'- End A: N45 17.108' W062 31.953'
- Start B: N45 17.105' W062 31.952'- End B: N45 17.126' W062 31.874'
-

Pictou County

36. Welsford, Intersection of West Branch and Old Pictou Road. - July 29

- From Halifax, travel on HWY-102 to HWY-104E, take exit 22 to HWY-106
- At the roundabout take the 4 exit towards Scotsburn on HWY-256, travel ~ 20km until intersection of West Branch Rd is met, turn right onto West Branch Rd.
- Continue on West Branch Rd until intersection of Old Pictou Rd is met on the right.
- Start A: N45 43.634' W063 03.262'- End A: N45 43.647' W063 03.262'
- Start B: N45 43.651' W063 03.201'- End B: N45 43.642' W063 03.263'

37. New Glasgow, 100m past intersection of Highway 4 and Highway 348. - July 29

- From Halifax, travel on HWY-102 to HWY-104E to exit 25
- Take HWY-348 to intersection with HWY-4, travel 100m past intersection.
- Start A: N45 35.138' W062 38.703'- End A: N45 35.191' W062 38.688'
- Start B: N45 35.188' W062 38.673'- End B: N45 35.137' W062 38.691'

38. Thorburn, Intersection of Thorburn Road and Finly Dan Road. - July 29

- From Halifax, travel on HWY-102 to HWY-104E to exit 25
- Turn left onto HWY-348-River Road for ~5km,(turns into Thorburn Rd poor signage and is not stated anywhere) until Pete's Pizza is reached.
- The intersection of Thorburn Rd and Finlay Dan Rd is just past Pete's Pizza
- Start A: N45 33.887' W062 32.821'- End A: N45 33.920' W062 32.768'
- Start B: N45 33.922' W062 32.771'- End B: N45 33.888' W062 32.829'

Antigonish County

39. Antigonish, Intersection of College Street and St. Mary's Street. - July 29

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 E/ Trans Canada HWY exit toward New Glasgow/ Cape Breton/ PEI Ferry Caribou
- Merge onto HWY-104 E/ Trans Canada HWY E- continue to follow HWY-104 for ~ 115 km
- Turn left at HWY-7
- Continue on HWY-4/ West St
- Turn Left at College St, travel down College St until intersection with St Mary's St.
- Start A: N45 37.408' W061 59.501'- End A: N45 37.457' W061 59.525'
- Start B: N45 37.458' W061 59.534'- End B: N45 37.416' W061 59.512'

Richmond County

45. Port Hawkesbury, 100m after intersection of Queen Street and Highway 4A. - August 11

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 E/ Trans Canada HWY exit toward New Glasgow/ Cape Breton/ PEI Ferry Caribou
- Merge onto HWY-104 E/ Trans Canada HWY E- travel on HWY-104 for ~ 167 km
- At the roundabout, take the 2nd exit onto HWY-4 E (note: doesn't look like a rotary at all) follow for ~6. 2 km
- Turn right at Hwy-4, Turn right at Queen Street
- Start A: N45 36.672' W061 20.879'- End A: N45 36.695' W061 20.947'
- Start B: N45 36.665' W061 20.882'- End B: N45 36.688' W061 20.951'

46. Barra Head, Intersection of Salmon River Road and Highway 247. - August 12

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 E/ Trans Canada HWY exit toward New Glasgow/ Cape Breton/ PEI Ferry Caribou
- Merge onto HWY-104 E/ Trans Canada HWY E- travel on HWY-104 for ~ 167 km
- At the roundabout, take the 2nd exit onto HWY-4 E (note: doesn't look like a rotary at all)
- Take HWY-4 through to St Peter's- Keep on HWY-4 until Barra Head. Stop at intersection of HWY-4 and Salmon River Rd. (Survey 100m up Salmon River Rd.)
- Start A: N45 40.742' W060 46.950'- End A: N45 40.687' W060 46.948'
- Start B: N45 40.687' W060 46.940'- End B: N45 40.741' W060 46.947'

47. Lower L'Ardoise (near Point Michaud), Intersection of Highway 247 and Doyle Road. ~12 km down 247. - August 11

- Take MacDonald Bridge- Continue on Nantucket Ave. Turn left at Victoria Rd, turn Right at HWY-118/ Woodland Ave, continue following HWY-118
- Take the exit onto HWY-102 N towards Airport
- Take the HWY-104 E/ Trans Canada HWY exit toward New Glasgow/ Cape Breton/ PEI Ferry Caribou
- Merge onto HWY-104 E/ Trans Canada HWY E- travel on HWY-104 for ~ 167 km
- At the roundabout, take the 2nd exit onto HWY-4 E (note: doesn't look like a rotary at all)
- Take HWY-4 through to St Peter's- Continue through St. Peter's and ~2km after turn right onto HWY-247
- Follow HWY-247 until in Lower L'Ardoise and Doyle Rd is reached.
- Start A: N45 36.695' W 061 20.947'- End A: N45 36.688' W061 20.951'
- Start B: N45 36.665' W061 20.882'- End B: N45 36.672' W061 20.879'

48. Sydney, 100m up Churchill Drive from Highway 347. - August 12

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport

- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
- Turn left at HWY-4
- Turn right onto the HWY-104 E ramp, Slight right at HWY-4.
- Head south on Esplanade W/HWY-4 W toward Wentworth St, turn left at Churchill Dr
- Start A: N46 12.731' W060 02.462'- End A: N46 07.326' W060 11.975'
- Start B: N46 07.321' W060 11.980'- End B: N46 07.354' W060 12.044'

49. Marion Bridge, Intersection of Highway 347 and Grand Mira Road. - August 12

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport
- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
- Turn left at HWY-4
- Head south on Esplanade W/HWY-4 W toward Wentworth St, Turn left at Alexandra St/HWY-32, Turn right to stay on Alexandra St/HWY-327.
- Turn right at Fleur-De-Lis Trail/Trout Brook Rd, then turn left. Turn right toward Grand Mira S Rd, continue straight onto Grand Mira S Road
- Start A: N45 58.850' W060 12.836'- End A: N45 58.854' W060 12.763'
- Start B: N45 58.856' W060 12.758'- End B: N45 58.868' W060 12.833'

50. Sydney River, 250m past intersection of Highway 4 and Highway 305. - August 12

- This one took over 3 hours, so you NEED 4 people
- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport
- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
- Turn left at HWY-4
- Head south on Esplanade W/HWY-4 W toward Wentworth St
- HWY-4/Kings Rd, Belvedere Dr. HWY-305 is to your right, drive 250 meters down the road.
- Start A: N46 06.653' W060 13.473'- End A: N46 06.698' W060 13.516'
- Start B: N46 06.645' W060 13.481'- End B: N46 06.696' W060 13.525'

51. Dominion, Intersection of Warburton Road and Highway 28. - August 12

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport
- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
- Turn left at HWY-4

- Head south on Esplanade W/HWY-4 W toward Wentworth St, Turn left at HWY-4 E/Townsend St, Turn right at HWY-4/Prince St.
- Turn left at Gardiner Rd, Turn right at Centerville St, Turn left at Oak St, Turn right at Obrien St, Turn right at Warburton Rd
- Start A: N46 12.747' W060 02.391'- End A: N46 12.726' W060 02.461'
- Start B: N46 12.756' W060 02.396'- End B: N46 12.731' W060 02.462'

52. Louisbourg, (Albert Bridge) ~2. 5 km in on New Boston Road (from the first entrance). - August 13

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport
- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
- Turn left at HWY-4- Continue on HWY-4 through until St. Peter's- keep going through St. Peter's until the outskirts of Sydney are reached.
- Once Sydney is reached, take Provincial HWY-125
- Take exit 8 to HWY-22- continue on HWY-22 until Albert Bridge
- Continue through Albert Bridge until New Boston Rd is reached, turn right onto New Boston Road- Travel ~2. 5 km up New Boston Rd.
- Start A: N45 59.757' W060 01.893'- End A: N45 59.694' W060 01.868'
- Start B: N45 59.748' W060 01.897'- End B: N45 59.700' W060 01.877'

54. Southwest Margaree, Intersection of Highway 19 and East side of Southwest Margaree Road. - August 13

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport
- Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou
- At the roundabout, take the 3rd exit onto HWY-19 N, Follow high way 19 until you run into Southwest Maragee.
- Start A: N46 16.605' W061 09.006'- End A: N46 16.630' W061 08.934'
- Start B: N46 16.632' W061 08.940'- End B: N46 16.613' W061 09.007'

55. Queensville, Intersection of McMaster Road and Crandells Road. - August 13

- McMaster turns into Crandell, there is a point where there is a road blocked off that looks like it may be a driveway, this is the place you do the survey.
- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave. Continue on Nantucket Ave, Turn right at HWY-118/Woodland Ave.
 - Take the exit onto HWY-102 N toward Airport
 - Take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, At the roundabout, take the 2nd exit onto HWY-4 E
 - Turn right at McMaster Rd

- Start A: N45 43.462' W061 20.380'- End A: N45 43.475' W061 20.489'
- Start B: N45 43.458' W061 20.381'- End B: N45 43.472' W061 20.458'

Victoria County

53. Baddeck, Intersection of Jones Street and Highway 205. - August 13

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth
- Continue on Nantucket Ave
- Turn left at Victoria Rd, Turn right at HWY-118/Woodland Ave.
- Take the exit onto HWY-102 N toward Airport, then take the HWY-104 E/Trans Canada Hwy exit toward New Glasgow/Cape Breton/PEI Ferry Caribou, continue to follow HWY-104 E.
- At the roundabout, take the 2nd exit onto Trans Canada Hwy E. Slight right at HWY-205/Shore Rd. Turn right to stay on HWY-205. Turn left at Jones St.

- Start A: N46 06.064' W060 44.900'- End A: N46 06.075' W060 44.829'
- Start B: N46 06.057' W060 44.896'- End B: N46 06.068' W060 44.823'

Hants County

17. Martock, 150m up Windsor Back Road from Highway 14. - July 8

- Take the ramp to Toll Bridge/MacDonald Bridge/Dartmouth, Continue on Nantucket Ave
- Turn left at Victoria Rd
- Slight right at Windmill Rd, Take the ramp to HWY-101/HWY-1/LR. Sackville/Windsor
- Take exit 4 for HWY-1 toward Newport/Ellershouse/HWY-215/St Croix, Turn left at HWY-1 .
- Slight left toward HWY-14, Turn right at HWY-14, Turn left at HWY-1/King St, Turn left at HWY-1/Water St, Continue to follow HWY-1, Falmouth Back Rd Windsor, NS
- Start Point: N44 57.137' W064 09.384'

Appendix B: Brand Structures

The following is a list of determinable brands, which have been categorized by the parent companies.

Parent Brand	Visible/ Determinable Brand
Bud	Budweiser, Bud Light
Cadbury Schweppes	Dr. Pepper, 7UP, Canada Dry, Mott's, Clamato, C-Plus, Hawaiian Punch, Schweppes, Snapple, Cadbury Trebor Allan, Caramilk, Cherry Blaster's, Crispy Crunch, Crunchie, Dairy Milk, Fruit and Nut, Fusion, Fuzzy Peach, Maynard's Wine Gums, Mr. Big, Sour Patch Kids, Wunderbar, Cadbury Adams, Bubbaloo, Bubbalicious, Certs, Chiclets, Cinna-A-Burst, Clorets, Dentyne, Halls, Trident
Coca-Cola	A&W Rootbeer, Barq's, Bacardi Mixer's, Coca-Cola, Crush, Dannon, Dasani, Evian, Five Alive, Fresca, Fruitopia, Minute Maid, Nestea, Nature's Own, Planet Java, Powerade, Spring Water, Sprite, Sunkist, Seagram's, Wink, Full Throttle
Coors	Molson, Coors
Frito-Lay	Lay's, Cheetos, Cracker Jack, Dorito's, Fritos, Hickory Sticks, Hostess Potato, Miss Vickies, Munchies, Munchos, Rold Gold, Ruffles, Sunchips, Tostito's
General Mills	Betty Crocker, Bugles, Fruit Snacks (e.g. Fruit by the Foot), Haagen-Dazs, Nature Valley, Old El-Paso, Pillsbury, Yoplait
Hershey Canada	Jolly Ranchers, Glossette, Oh Henry, Reese, Skor, Pot of Gold, Twizzlers, Whoppers, York, Eat-More, Ice Breaker
Kraft	Crystal Light, Country Time, Cheez Whiz, Delissio, Del Monte, Jello, Kool-Aid, Lunchables, Mr. Christie
Labatt	Blue, Olands, Keiths
Mars (Effem Inc.)	3 Musketeers, Bounty, Mars, M&M's, Milky Way, Skittles, Snickers, Starburst, Twix, Maltesers
Mr. Freeze	Freezie
Nestle	Aero, Baby Ruth, Big Turk, Butterfinger, Coffee Crisp, Drumstick, Kit Kat, Mirage, Rolo's, Quality Street, Smarties, Sweetarts, Turtles, Willy Wonka (Nerds, Gobstoppers, etc.), Itzakadoozie
Old Dutch	Humpty Dumpty, Old Dutch
Pepsi-Cola	Aquafina, Gatorade, Mugs, Pepsi, SoBe, Tropicana, Quaker
Sobey's Inc	Foodland, Needs, Price Chopper, Sobey's
Storck	Campino, Riesen, Werthers
Tootsie Roll	Blow Pop, Charms, Dots, Frooties, Tootsie Pop, Double Bubble, Caramel Apple Pops
Unilever	Breyer's, Good Humour (Klondike), Popsicle, Revello, Lipton, Red Rose, Salada
Vachon	Ah Caramel, Joe Louis, Passionflake
Wrigley's	Excel, Extra, Freedent, Hubba Bubba, Juicy Fruit, Life Savers

Appendix C: Litter Offense Fines

Environment Act

Disposing of pesticide, thing treated with pesticide or pesticide container (specify) contrary to the regulations. (In Section 79(3) of the Environment Act.) **\$682.00 fine.**

Releasing litter into the environment contrary to the Act or regulation. (In section 99(2) of the Environment Act) **\$452.00 fine.**

Regulations Made Pursuant to the Environment Act

Within the Solid-Waste Resource Management Regulations

Permitting release of litter from commercial outlet, service outlet, plant, building, facility or thing (specify). (In section 20(1) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to clean up litter discharged from commercial outlet, service outlet, plant, building, facility or thing (specify). (In section 20(2) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Permitting release of litter at construction or demolition site. (In section 21(1) of the Regulations Made Pursuant to the Environment Act) **\$682.00 fine.**

Failing to clean up discharged litter from construction or demolition site. (In section 21(2) of Regulations Made Pursuant to the Environment Act) **\$682.00 fine.**

Failing to provide and service, maintain or empty (specify) receptacles for litter and recyclable materials. (In section 22(1) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to keep property or lands within 15 m of property boundaries (specify) free from litter. (In section 22(2) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to collect and dispose of discarded materials as prescribed in the regulations. (In section 22(3) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to provide adequate receptacles for litter and recyclable materials at public or private event. (In section 23(1)(a) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to service, maintain and empty receptacles for litter and recyclable materials at public or private event. (In section 23(1)(b) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to ensure property where event is held or lands within 15 m of property boundaries (specify) are free from litter within 24 hours after an event. (In section 23(2) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Attaching flyer, advertisement or other literature to utility pole, structure, fence or thing (specify) without approval of owner or local authority. (In section 24(1) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to put posting date on flyer, advertisement or other literature. (In section 24(2)(a) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to remove flyer, advertisement or other literature within 30 days after event. (In section 24(2)(b) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to dispose of flyer, advertisement or other literature as prescribed in the regulations. (In section 24(2)(c) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Distributing flyer, advertisement or other literature by placing it on a parked vehicle. (In section 24(3) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Abandoning structure, vehicle or thing (specify) on frozen watercourse. (In section 25(a) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Failing to remove structure, vehicle or thing (specify) from frozen watercourse. (In section 25(b) of the Regulations Made Pursuant to the Environment Act) **\$452.00 fine.**

Within the Pesticide Regulations

Handling, using, abandoning or disposing of pesticide contrary to product directions/ limitations, or directions of administrator (specify). (In section 14(1) of the Regulations made Pursuant with the Environment Act) **\$682.00 fine.**

Handling, using, applying, abandoning or disposing of pesticide in manner that results in contamination of the environment. (In section 14(2) of the Regulations made Pursuant to the Environment Act) **\$682.00 fine.**

Public Highways Act

Littering on a highway. (In section 43(1)(a) of the Public Highways Act) **\$394.50 fine.**

Permitting person to litter on highway. (In section 43(1)(b) of the Public Highways Act) **\$394.50 fine.**

Motor Vehicle Act

Throwing object at a motor vehicle. (In section 173(1) of Motor Vehicle Act)

Depositing material that may damage tires (specify) on highway. (In section 173(2) of Motor Vehicle Act)

Littering from vehicle on highway. (In section 173(4) of Motor Vehicle Act) **\$387.50 fine.**

Any person who violates these laws can be liable for the expenses of removing the litter, refuse, garbage and/or other objects.

Beaches Act

Dumping or depositing garbage or other material on beach other than in receptacle so provided. (In section 8(1)(f) of the Beaches Act) **\$222.00 fine.**

Regulations made Pursuant to the Beaches Act

Failing to clean up animal excrement or mess left on beach. (In section 8(4) of the Regulations made Pursuant to the Beaches Act) **\$164.50 fine.**

Provincial Parks Act

Dumping or depositing garbage or other materials in provincial park other than in receptacle so provided. (In section 33(f) of the Provincial Parks Act) **\$222.00 fine.**

Regulations Made Pursuant to the Provincial Parks Act

Failing to leave campsite in clean and sanitary condition. (In section 23 of the Regulations made Pursuant to the Provincial Parks Act) **\$164.50 fine.**

Failing to clean up animal excrement or mess left by domestic animal in park. (In section 24(4) of the Regulations made Pursuant to the Provincial Parks Act) **\$164.50 fine.**

Dropping or discarding burning match, cigar, cigarette or other burning substance in park. (In section 25(4) of the Regulations made Pursuant to the Provincial Parks Act) **\$164.50 fine.**

Trails Act

Dumping or depositing garbage or other material on trail other than in receptacle so provided. (In section 22(f) of the Trails Act) **\$222.00 fine.**

Regulations Made Pursuant to the Trails Act

Failing to leave trail in clean and sanitary condition. (In section 13 of the Regulations made Pursuant to the Trails Act) **\$164.50 fine.**

Failing to clean up excrement or mess left by domestic animal on trail. (In section 14(3) of the Regulations made Pursuant to the Trails Act) **\$164.50 fine.**

Dropping or discarding burning match, cigar, cigarette or other burning substance on trail. (In section 15(3) of the Regulations made Pursuant to the Trails Act) **\$164.50 fine.**

Failing to remove personal property when ordered to leave a trail. (In section 19(1) of the Regulations made Pursuant to the Trails Act) **\$164.50 fine.**

Wilderness Areas Protection Act

Dumping or depositing litter, garbage or refuse in wilderness area other than in authorized container. (In section 17(2)(k) of the Wilderness Area Protection Act) **First offence \$337.00, Second offence \$797.00, Third or subsequent offence \$1487.00.**

Posting notice, plaque, marker, sign or device (specify) in wilderness area. (In section 27(2)(b) of the Wilderness Areas Protection Act) **First offence \$337.00, Second offence \$797.00, Third or subsequent offence \$1487.00.**

Protection of Property Act

Dumping or depositing material of any kind or causing, suffering or permitting material to be dumped or deposited on premises. (In section 3(1)(d) of the Protection of Property Act) **\$222.00 fine.**

Posting sign or notice on premises by person who is not the occupier or person acting on behalf of the occupier. (In section 3(6) of the Property Protection Act) **\$222.00 fine.**

Halifax-Dartmouth Bridge Commission Act

Throwing from or leaving any material or thing on bridge. (In section 10 of the Halifax-Dartmouth Bridge Commission Act) **\$135.75 fine.**

Throwing foreign materials into fare hopper. (In section 11 of the Halifax-Dartmouth Bridge Commission Act) **\$135.75 fine.**

Town of Windsor By-Laws

Within the Solid waste By-law

Depositing solid waste at place other than at applicable municipal solid waste management facility. (In section 16. 04 of the Town of Windsor By-Laws) **\$222.00 fine.**

Placing material or causing material to be placed in municipal solid waste management facility in contravention of by-law, resolution of council or directions of operator (specify). (In section 16. 05 of the Town of Windsor By-Laws) **\$222.00 fine.**

Placing solid waste in or adjacent to municipal solid waste management facility when facility is not open or when operator or municipal staff refuse to accept solid waste (specify). (In section 16. 06 of the Town of Windsor By-Laws) **\$222.00 fine.**

Placing solid waste or causing or permitting solid waste to be placed in municipal solid waste management facility that is not permitted to be placed or that is generated outside Town of Windsor. (In section 16. 07 of the Town of Windsor By-Laws) **\$222.00 fine.**

Placing solid waste or causing or permitting solid waste to be placed in municipal solid waste management facility that is not separated as required or that is falsely or misleadingly presented or packaged. (In section 16. 08 of the Town of Windsor By-Laws) **\$222.00 fine.**

Owner or occupant of property permitting accumulation of solid waste in or around property. (In section 16. 1 of the Town of Windsor By-Laws) **\$222.00 fine.**

Within the Streets By-Law

Posting any bill, notice, poster or advertisement on any town property or tree. (In section 10. 06 of the Town of Windsor By-Laws) **\$222.00 fine.**

Littering on any sidewalk, street, road, lane, park, public recreation area or highway. (In section 10. 09 of the Town of Windsor By-Laws) **\$222.00 fine.**

Town of Kentville By-Laws

Within the Vending By-Laws

Leaving vending location with removing and properly disposing of all recyclables and litter associated with vending activity. (In section 15(6) of the Town of Kentville By-Laws) **\$279.00 fine.**

Town of Clark's Harbour By-Laws

Within the Peace and Order By-law

Throwing dirt, filth or rubbish on sidewalk, street or public place. (In section 3 of the Town of Clark's Harbour By-Laws) **\$164.50 fine.**

Municipality of the District of Barrington By-Laws

Within the Collection, Storage and Disposal of Waste By-law No. 8

Depositing waste in place other than approved solid waste disposal area. (In section 3 of the Municipality of the District of Barrington By-Laws) **\$222.00 fine.**

Town of Antigonish By-Laws

Within the Mobile Vendors By-Laws

Failing to pick up, remove and dispose of all trash or refuse from sales before leaving location. (In section 7(f) of the Town of Antigonish By-Laws) **\$394.50 fine.**

Town of Yarmouth By-Laws

Within the Garbage By-Laws

Depositing dirt, filth or garbage in street. (In section 2. 02 of the Town of Yarmouth By-laws) **\$222.00 fine.**

Town of Mahone Bay By-Laws

Within the Park Commission By-Law

Depositing rubbish or other articles on any part of park. (In section 3(a) of the Town of Mahone Bay By-Laws) **\$222.00 fine.**

Town of Lunenburg By-Laws

Within the Cemetery By-law

Throwing garbage on cemetery grounds. (In section 14 of the Town of Lunenburg By-Laws) **\$164.50 fine.**

Town of Digby By-Laws

Within the Public Places By-Law

Littering or leaving waste in public place other than in designated waste receptacle. (In section 9(11) of the town of Digby By-Laws) **\$222.00 fine.**

Within the Vending and Licensing By-Law

Failing to remove litter, trash or refuse associated with vending before leaving location. (In section 18(5) of the Town of Digby By-Laws) **\$682.00 fine.**

Town of Bridgewater By-Laws

Within the Town Property By-Law

Littering on town property. (In section 3 of the town of Bridgewater By-Laws) **\$222.00 fine.**

Region of Queens Municipality By-Laws

Within the Solid Waste Collection By-Law

Depositing solid waste on street, property or highway contrary to Solid Waste Collection By-Law. (In section 8(1)(b) of the Region of Queens Municipality By-Laws) **\$222.00 fine.**

Municipality of the District of Chester By-Laws

Within the Public Properties By-Law

Leaving litter, rubbish, garbage or other waste on public property other than in designated receptacles. (In section 13(b) of the Municipality of the District of Chester By-Laws) **\$164.50 fine.**

Municipal Government Act

Within the Streets and Highways section

Depositing or permitting sewage, refuse, garbage, rubbish or other matter to accumulate in street or in drain, gutter, sluice or watercourse on street. (In section 318(1)(g) of the Municipal Government Act) **\$222.00 fine.**

Causing or permitting sewage, refuse, garbage, rubbish or other matter to accumulate in street or in drain, gutter, sluice or watercourse on street. (In section 318(1)(h) of the Municipal Government Act) **\$222.00 fine.**

Appendix D: Data Tally Sheet

Site Description		
Location		
Site Number		
Distance/ Width		
GPS	Start a	
	End a	
	Start b	
	End b	
Litter source 2 km		
Garbage Bins		
Anti-Litter Signs		
S P E C I A L C O N S I D E R A T I O N S	Litter Catch	
	Road Type	
	Weather	
	Amount Collected	
	Special Items	
Other		
Pictures Taken		
Notes		

Miscellaneous

Material

expanded polystyrene

plastic

metal -aluminum
 -steel
 -miscellaneous

glass

paper -napkin
 -other

wood

rubber

cloth

rope

composite (more than one material)

other

Brand

unidentifiable:

Quick Service

Material

expanded polystyrene

plastic

metal -aluminum
 -steel
 -miscellaneous

paper -napkin
 -other

wood

cloth

composite (more than one material)

other

Brand – only identifiable brands

Mcdonalds-
Tim Hortons-
Wendy's-
Burger King-
Subway-
DQ-

Snack Food

Material

plastic

metal -aluminum
 -steel
 -miscellaneous

paper -napkin
 -other

wood

composite (more than one material)

other

Brand – only identifiable brands

Frito Lays-

Freezie-

Unilever (Popsicle)-

Hershey-

Nestle-

Cadbury Schweppes-

Wrigleys-

Tobacco

Material

plastic

metal -aluminum
 -steel
 -miscellaneous

paper -napkin
 -other

composite (more than one material)

other

Brand – only identifiable brands

Players-

Can Class-

Peter J -

Belvedere-

7-

Export A-

Belmont-

Demaurier-

Matinee-

Prime Time-

Unidentifiable-

Grocery

Material

expanded polystyrene

plastic

metal -aluminum
 -steel
 -miscellaneous

glass

paper

wood

rubber

cloth

composite (more than one material)

rope

other

Brand

Sobeys-
Super Store-
Shoppers-

Deposit/ Disposable Cups

Material

expanded polystyrene

plastic

metal aluminum
 steel
 miscellaneous

glass

paper

rubber

cloth

composite (more than one material)

other

Brand

Tim Hortons-

Pepsi-

Coke-

Bud light-

Keiths -

Coors light-

Corona-

McDonalds -

Appendix E: Municipal Litter Initiatives Summary

The information contained in this summary document was provided by the waste reduction/education coordinators from each of the seven solid waste regions in Nova Scotia. There may be additional litter initiatives in each regional conducted by external groups such as the AAH program, school groups, or the Great NS Pick-Me-Up.

Region 1: Cape Breton Regional Municipality

- Usually conduct a anti littering newspaper campaign in late May early June to coincide with promoting litter cleanups.
- Air a litter commercial on ATV usually at the end of May and the first 2 weeks in June and again throughout the month of October.
- Cable ads run periodically from May to November focusing on anti littering.
- CBRM Solid Waste Department supports litter cleanup imitative by supplying dumpsters free of charge to schools, service clubs, community groups, student groups or neighborhood cleanup groups that want to conduct a cleanup in their community. The department takes care of arranging for the delivery of the dumpster to the designated cleanup area and then takes care of the collection of the dumpster when the group is finished.
- Solid Waste Education Staff conduct at least 2 litter clean-ups a year in a designated area of the municipality. Two clean-ups were conducted in the spring of 2008 in 2 communities.

Region 2A: Town and County of Antigonish, Mulgrave, Canso, St. Mary's & Guysborough

- The Guysborough Waste Management Facility does a litter clean up though Adopt-a-Highway twice a year along Route 16 from Boylston to Monastery.
- The new Mayor for the Town of Mulgrave has held a few litter clean-ups along the shore in Mulgrave through the TD Shoreline Clean-up program.

- C. MacIsaac has also organized similar clean up in Isaacs Harbour and around Sherbrooke.
- St FX students do a clean up each year in the Town of Antigonish during frosh week. The students also challenge council to a clean up of the Brierly Brooke each Earth Day.
- There are also municipal illegal dumping clean-up programs.

Region 2B: Town and County of Pictou, New Glasgow, Trenton, Stellarton & Westville

Pictou has a program called Go Clean Get Green, and it is run out of the Town of New Glasgow.

Region 3: Cumberland, Amherst, Parrsboro, Oxford & Springhill

No information provided to date.

Region 3: Colchester, Truro, Stewiacke

No information provided to date.

Region 3: East Hants

No information provided to date.

Region 4: Halifax Regional Municipality

- HRM conducts municipal works litter clean up as part of operations which involves litter collection in streets, roads, parks, grounds and all HRM public spaces.
- HRM also partners with community organizations and Clean NS to promote community based litter pick ups in neighborhoods.
- HRM has undertaken a litter education and awareness campaign that includes education and compliance.
- HRM introduced street right of way multi-stream litter receptacles.

Region 5: Annapolis, Kings, Kentville, Wolfville, Berwick, Middleton, Bridgetown and Hantsport

- Have a program with criteria for waiving tipping fees for illegal dump clean-ups on private land if it is clear that the owner is not responsible.
- Assist with beach clean-ups and other litter clean-ups (such as AAH) with waived tipping fees. They also deliver and pick up roll-off containers for these clean-ups as needed.

Region 6: Town and District of Lunenburg, Chester, Bridgewater, Mahone Bay, Region of Queens, Town and District of Shelburne, District of West Hants, Windsor, Lockeport and Barrington, Clark's Harbour

- Facilitate an annual litter challenge called the Earth Day Challenge.
- From 2003-2006 Region 6 ran a Municipal Challenge where points were awarded to Municipalities who sent staff out to clean-up litter.

Region 7: Town and County of Digby, Clare, Argyle and District of Yarmouth

- Waste Check has a Community Litter Clean-up program which is offered to non profit groups to clean up to a maximum of 200 kms and they pay \$100/ km (both sides of the road)
- The Municipality of Argyle started the program just in their municipality and have over 20 groups participate each year, they pay \$175/km.
- The Cape Forchu Community Clean Up program goes on all year long and they were runner up for a Mobius Award in the past.