

2019-2020

JUNCTION CREEK PLASTIC AWARENESS REPORT

Prepared by:
Plastic-Free Greater Sudbury



2020 | MARCH

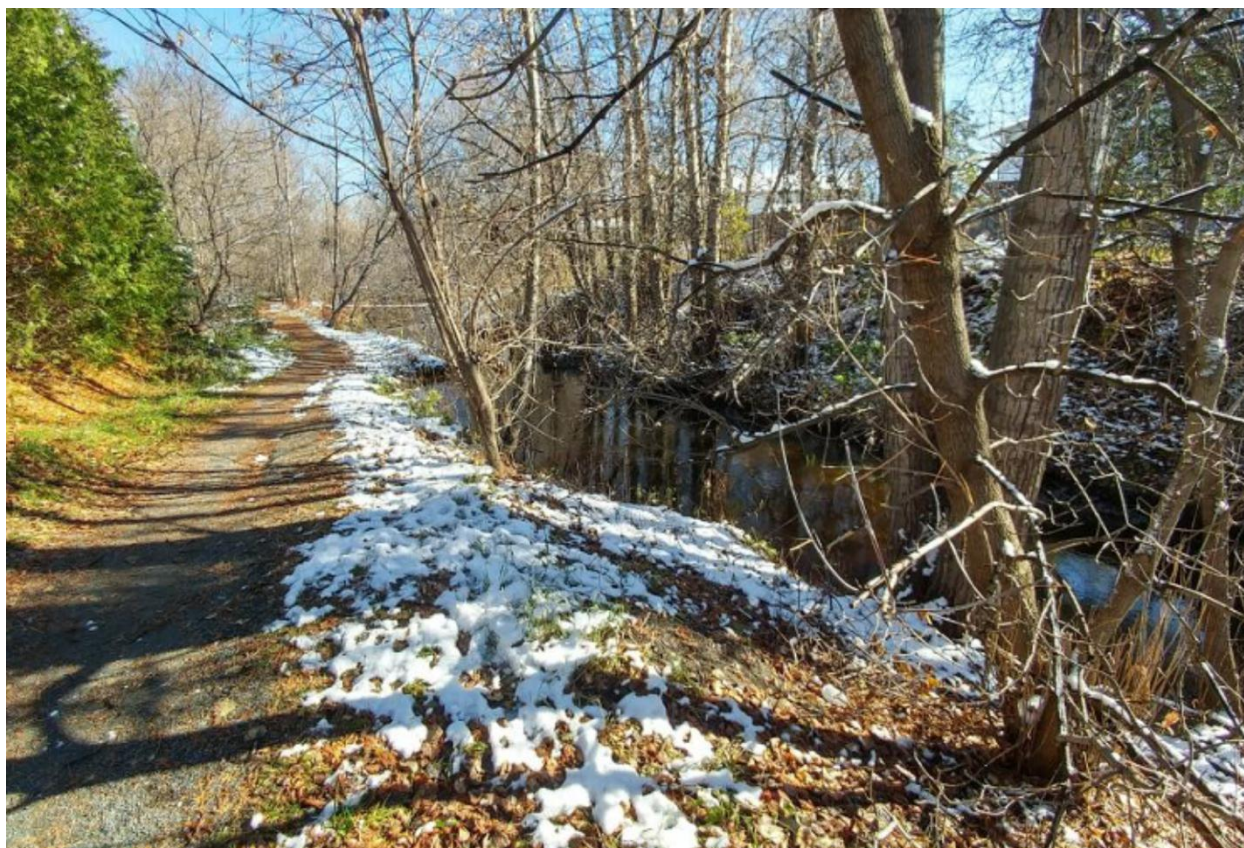


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Junction Creek Stewardship Committee and Plastic-Free Greater Sudbury have been working together since 2018. We soon partnered in a multi-year Federal grant project called 'Reducing Plastic Waste in Urban Waterways' (2019-2021). We increased awareness of plastic waste in Junction Creek by assessing and mitigating the problem and engaging stewardship through clean-ups and educational programs.

In an effort to gain a better understanding of the types and sources of litter polluting the watershed (areas around the creek), the Junction Creek Stewardship Committee developed a long-term litter monitoring program for the urban reaches of Junction Creek, and Plastic-Free Greater Sudbury conducted inventory tallies during clean-ups in 2019 and 2020.



Junction Creek Stewardship Committee

Vision: A healthy and revitalized Junction Creek ecosystem.

Mission: To lead the way for improving and maintaining a healthy Junction Creek watershed by: conducting research and monitoring programs to create understanding and inform sound decisions; organizing restoration activities to recover and protect the watershed; providing educational opportunities to share knowledge and promote its ecological, economic, and health benefits; and connecting the community with Junction Creek to empower long-term stewardship.



Plastic-Free Greater Sudbury

Vision: To make Greater Sudbury a single-use plastic free community.

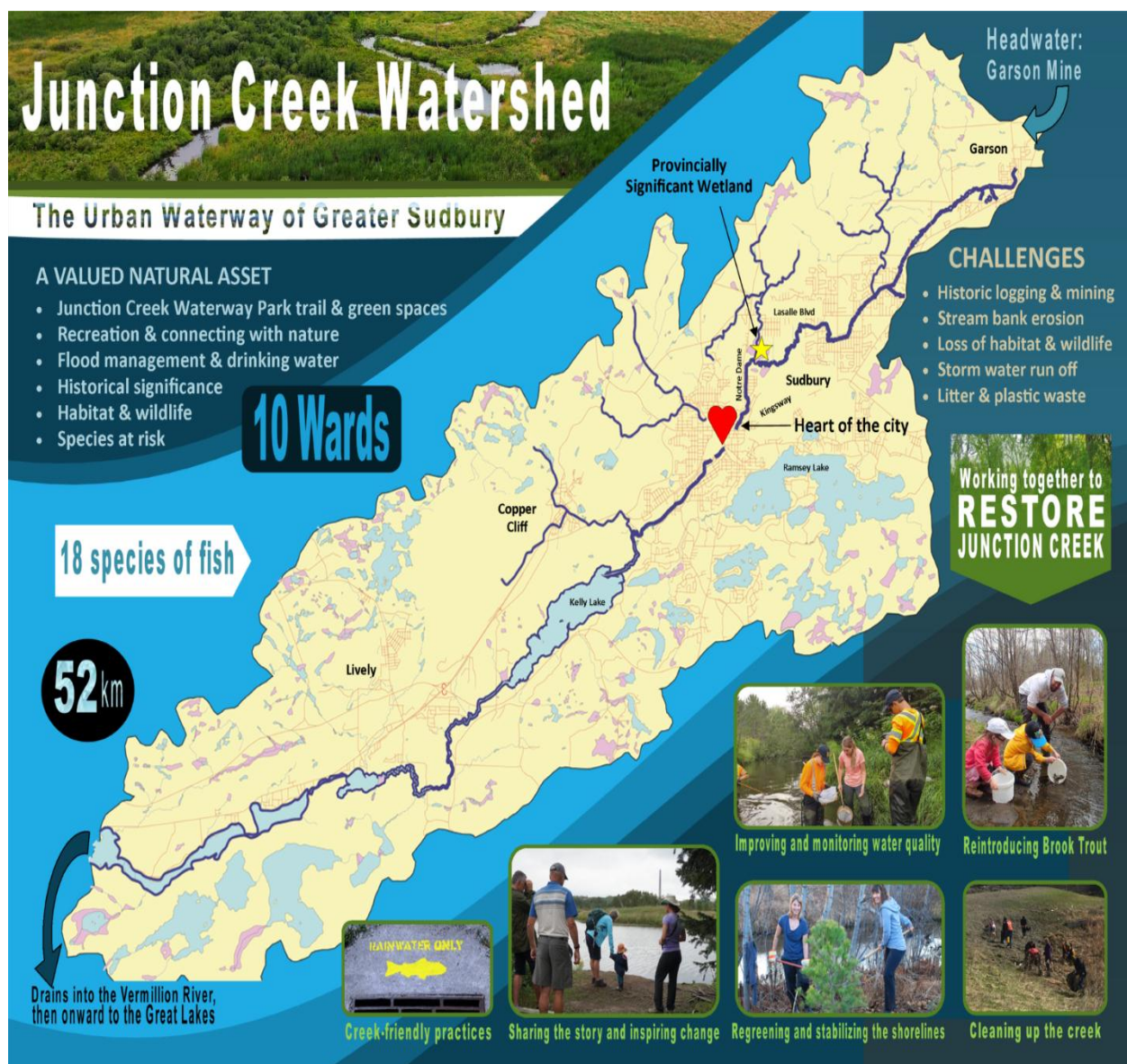
Mission: A community campaign dedicated to challenging the status quo of single-use plastic use in Greater Sudbury through collaborative, sustainable, and socially inclusive efforts.



The Junction Creek Watershed

Junction Creek connects our communities as it flows from its headwaters in Garson, through New Sudbury, under the downtown core, through Kelly Lake, and into Lively then connects with the Vermilion River and Spanish River before draining into Lake Huron.

As the Junction Creek watershed continues to recover from past mining and logging practices, it also faces ongoing urban and industrial pressures. Decades of community restoration efforts have revived Junction Creek's habitats and biodiversity, offering wildlife corridors and accessible green space in an urban centre. The watershed is valued for its recreational opportunities, important role in flood management, historical and cultural significance, and its diverse natural heritage.



Litter in Junction Creek

As an urban waterway, litter and garbage dumping are an ongoing issue for stream health. Litter and plastic waste are detrimental to the health of the environment and community. Removing litter and plastic waste from the creek and areas around it reduces harmful substances from entering the waterway and improves water quality.

With the help of thousands of volunteers, the Junction Creek Stewardship Committee have removed over 84,000 kg of garbage from the creek since 1999. When we know the types of waste and litter hotspots in the creek, we can create targeted educational programs, identify sources of waste, and inform mitigation strategies. Ultimately, the results from 'Reducing Plastic Waste in Urban Waterways' project will create long-term action to increase awareness and reduce the amount of litter and plastic waste in the Junction Creek watershed.



Litter & Plastic Waste Awareness Questionnaire

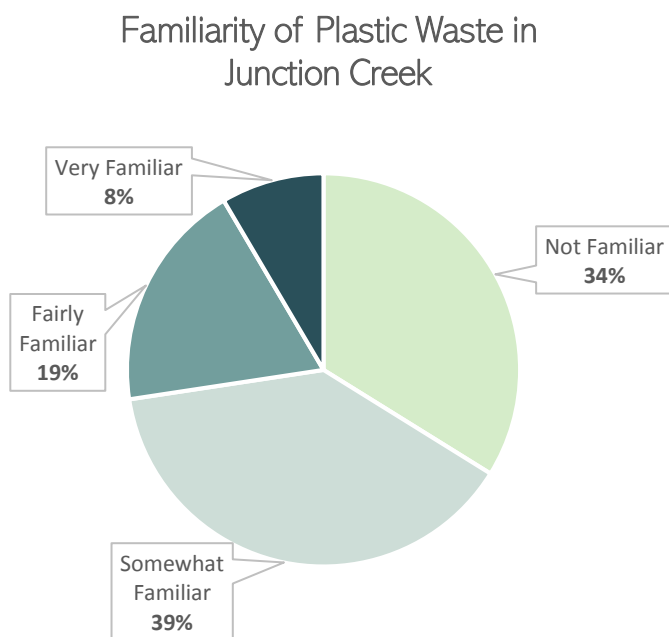
We conducted an English and a French online questionnaire asking residents in Greater Sudbury about their knowledge of plastic waste in Junction Creek. After analyzing the results, it is apparent that although most respondents don't know how much plastic waste is in the creek, they are very concerned and are willing to take action.

Of the 1,628 responses, 1,566 answered the English questionnaire and 62 answered the French questionnaire. Respondents ranged from less than 18 years old to above 65 years old; 1.8% were under 18, 8.1% were between 18-24, 13% were between 25-34, 15% were between 35-44, 14% were between 45-54, 21% were between 55-64, and 28% were 65+. In addition, asked respondents for their gender, the majority of the respondents were female (70%), 28% were male, 0.37% were other, and 1.7% rather not specify.

We learned that 37% of respondents had participated in an organized garbage clean-up before; 7% attended a clean-up in Junction Creek and 30% attended elsewhere. In addition, 37% had never participated in a clean-up before but they are interested in joining one in the future. Lastly, 26% of respondents hadn't participated in a clean-up and aren't interested in joining one.

Familiarity of Plastic Waste in Junction Creek

We know that respondents want to do something about plastic waste in the creek, but they aren't aware of the extent of plastic waste in Junction Creek. This graph demonstrates that over 70% of respondents are "not familiar" or "somewhat familiar" with the plastic waste in Junction Creek.



After analyzing respondents' **familiarity** of plastic waste in the creek based on where they live in Greater Sudbury (see graph in Appendix A), the highest percentage of familiarity was found in Robinson/Lockerby area, in which 14.1% of residents responded as "very familiar" with plastic waste in Junction Creek. Other areas including Gatchell and Downtown had high percentages of residents who were also very familiar, while outlying communities were less familiar.

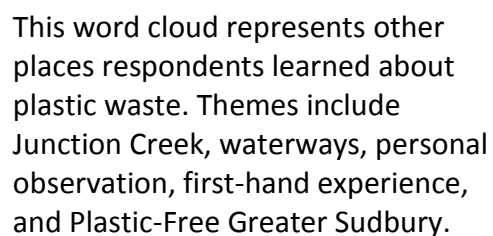
The neighbourhood's vicinity to Junction Creek may be a contributing factor to respondents' familiarity of plastic waste in the watershed since they would have first-hand experience seeing litter along the shore or in the creek and more of an invested interest to learn about natural features where they live. Other attributing factors may include recreational use of trail systems along Junction Creek, past educational and stewardship programs, and the vicinity of residents' workplace to Junction Creek.



Knowing where people learn about plastic waste issues helps us understand where to target our efforts to raise awareness. Almost half (49%) of the respondents learned about plastic waste through media (TV, news, radio, and/or social media). Other places include education programs (at school, during a presentation, and/or at a display) at 22% and from friends and/or family (14%). Almost 10% of respondents haven't yet learned about plastic waste issues.

A bar chart titled 'How did you learn about the 2019 election?' showing the number of people who learned about the election from different sources. The x-axis lists five sources: Nowhere, Education Programs, Family/Friends, Media, and Other. The y-axis represents the number of people, with a scale from 0 to 1,200. The bars are colored in shades of teal and dark blue. The values for each bar are: Nowhere (226), Education Programs (535), Family/Friends (337), Media (1205), and Other (145).

Source	Number of People
Nowhere	226
Education Programs	535
Family/Friends	337
Media	1205
Other	145

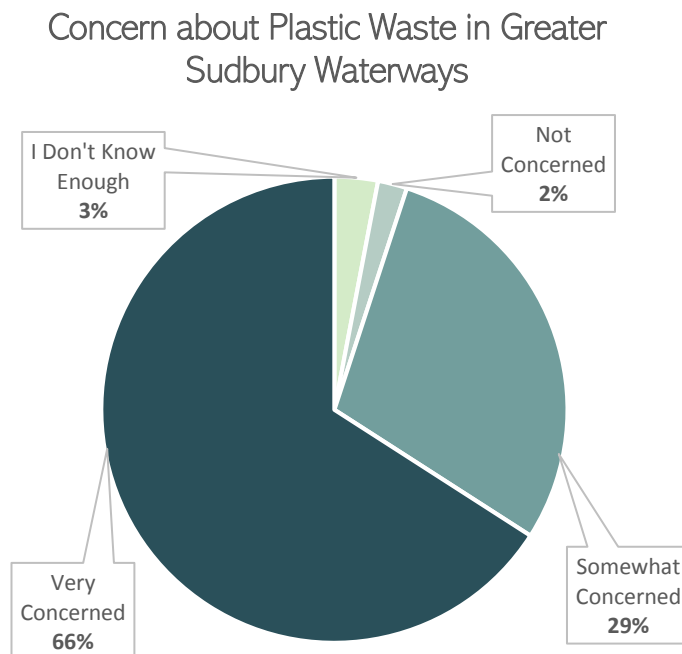


Now that we know most people get their information from media, we can confidently continue focusing our outreach efforts through those communication channels.

Concerns about Plastic Waste in Greater Sudbury Waterways

Respondents also shared their level of **concern** for plastic waste in Greater Sudbury's waterways. From the responses, 95% are either "somewhat concerned" or "very concerned" (29% and 66% respectively), 2% are "not concerned" and 3% don't know enough to answer the question. This means that even though we found that most respondents are not familiar with the extent of plastic waste in Junction Creek, they are still concerned about it.

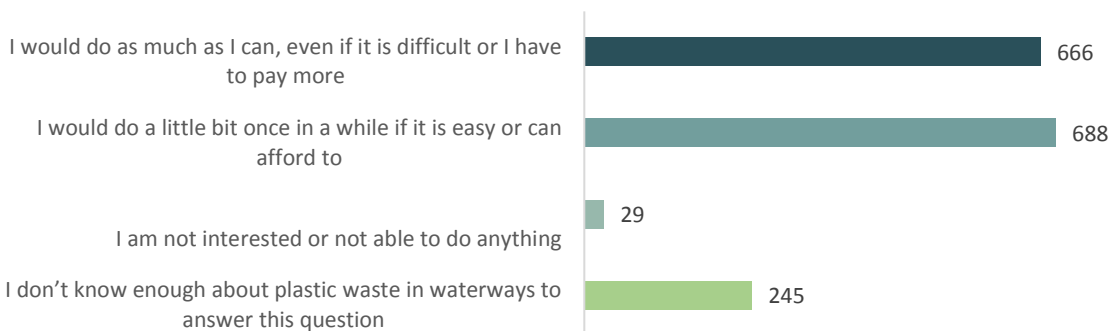
Moving forward, this public concern should be taken into consideration for watershed management, environmental restoration, and planning community initiatives.



Will to Take Action

Over 82% of respondents said they are **willing** to reduce plastic waste, while 15% require more information about plastic waste in waterways, and 2% are either not interested or not able to do anything. This highlights that Sudburians are ready to take action to reduce their plastic waste and more outreach effort is required to inform the community about local issues of plastic waste in Greater Sudbury's waterways.

Given what you know about plastic, what would you do?



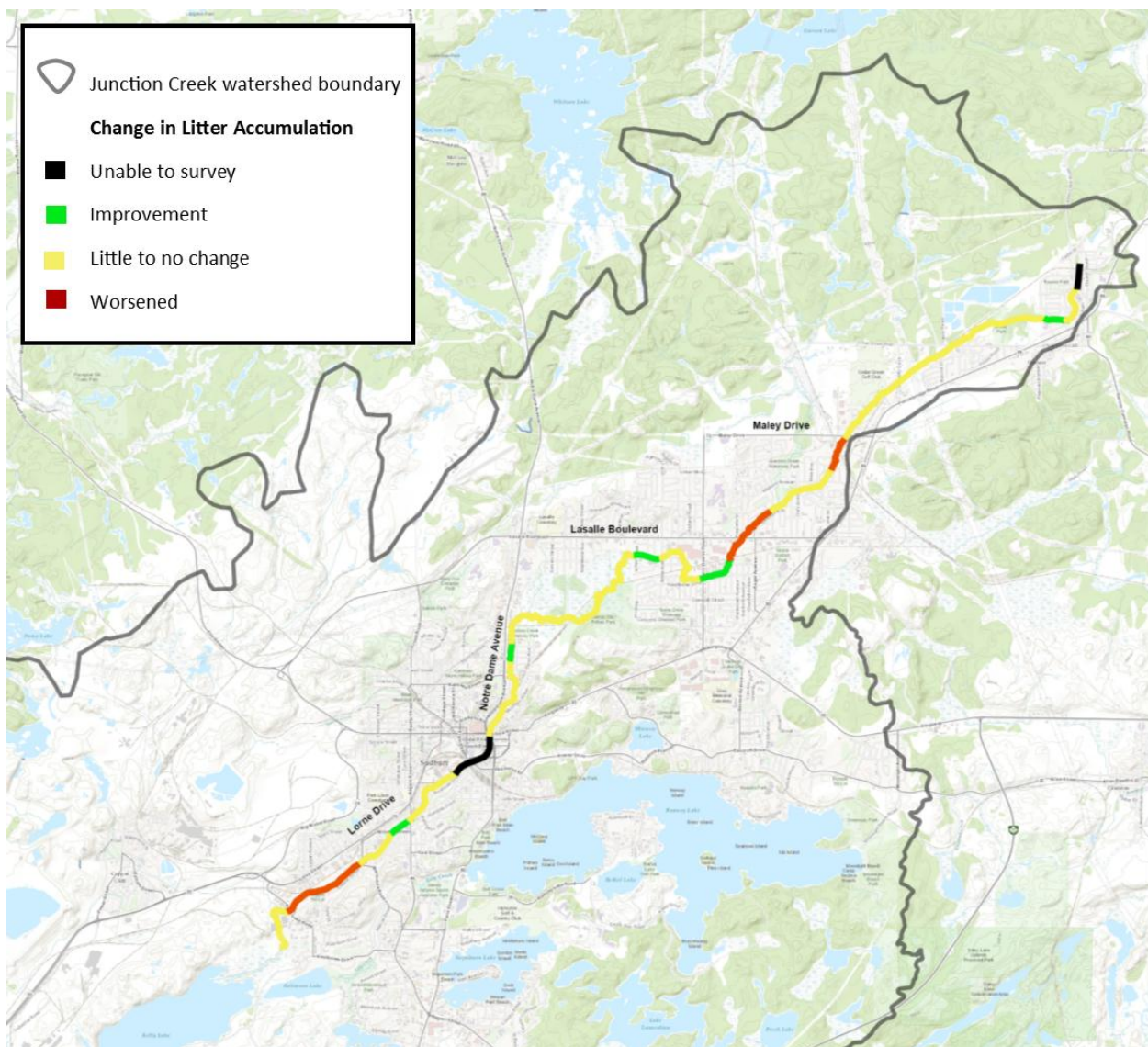
*If you would like more information about questionnaire responses, please email info@junctioncreek.com

Litter Monitoring & Clean-Ups

Litter Monitoring

The Junction Creek Stewardship Committee monitored the litter accumulation throughout 2019 and 2020 to identify hotspots and determine what areas of the creek to clean up (see map below). Litter monitoring surveys were conducted in the Spring and Fall, and in 2019 they were also conducted following clean-up events.

In most of the creek we saw little to no change or some improvements to the amount of litter accumulated between 2020 and 2019, with 2 areas that worsened in New Sudbury and one area in Gatchell.



Clean-Ups

Between 2019 and 2020, the Junction Creek Stewardship Committee (JCSC) and Plastic-Free Greater Sudbury (PFGS) coordinated 17 clean-ups through the City of Greater Sudbury's Adopt-a-Spot program (see Appendix B for details about the clean-ups). The JCSC identified target locations during litter monitoring surveys and clean-ups were around 2 hours in duration. Over 360 volunteers helped to remove 3,402 kg of garbage from Junction Creek.

Garbage Tally Process

As participants collected garbage during organized creek clean-up events in 2019, they brought the garbage to a designated area in which PFGS completed an inventory. Experienced volunteers from PFGS followed a sorting system to categorize and count pieces of garbage using hand-held counters, and recorded the data on a tracking sheet to tally the results. In 2020, due to the COVID-19 pandemic, clean-up volunteers were required to track and tally the garbage that they collected. For both years, the bags of garbage were weighed using a luggage scale and the total area restored was calculated using the Area Calculator Tool on Google Earth.



Apr 28, 2019 - New Sudbury

Most common plastics found

In 2019 and 2020, the most commonly found plastic items were single-use plastics, particularly **wrappers**, **bags**, and **bottles**, respectively (see infographic on page 13).



Aug 14, 2019 - Agnes Street

Plastic wrappers were overwhelmingly the most common plastic item found. Wrappers included granola bar wrappers, popsicle wrappers, candy wrappers, gum packages, condom wrappers, etc. Wrappers are typically made from very thin plastic and break down into microplastics (>5mm piece of plastic) faster than thicker plastics.

Plastic bags included plastic grocery bags, chip bags, milk bags, etc. Depending on the location some plastic bags were entangled within the environment making it difficult to remove without it breaking up into microplastics, which were difficult to pick up with gloves on.

Plastic bottles included water, pop, iced tea, juice, etc. These were found on the trails, on the banks of the creek, and floating in the creek.



Aug 16, 2019 - St. Joseph St

The most common **hot and cold beverage cups** found were from Tim Hortons.

All sizes, lengths and colours of **plastic straws** were found at every clean-up. Often times the lids were still attached to the straws and sometimes the straws were already breaking down.



Aug 14, 2019 - St. Agnes St

Foam pieces were found in many shapes and sizes from macroplastics to microplastics. Foam pieces included packing peanuts, takeout containers, foam trays, and insulation-based pieces. They broke down very easily when picking them up, this made it difficult to remove all of the pieces.

Other tallied items included aluminum cans (energy drinks, pop, beer), paper products (cardboard, milk cartons, paper), electronics (computers, wires), clothes, and toys.

Considerations

1. Litter monitoring in 2020 was only conducted in the Spring and Fall. We couldn't conduct surveys following clean-ups since they were completed later in the year (during the Fall only due to COVID-19) and there wasn't enough time to monitor re-accumulation of litter.
2. We weren't able to do as many clean-ups in 2020 (6 in 2020 compared to 11 in 2019). We have a partnership with City of Greater Sudbury's Adopt-a-Spot clean-up program and since it was put on hold from April 2020 to September 2020 (due to the COVID-19 pandemic) we couldn't coordinate clean-ups during that time. Typically, clean-ups begin in April and run until November (depending on the weather). We recommenced clean-ups in September 2020.

PLASTIC WASTE in Junction Creek

2019
2020



17
CLEANUPS



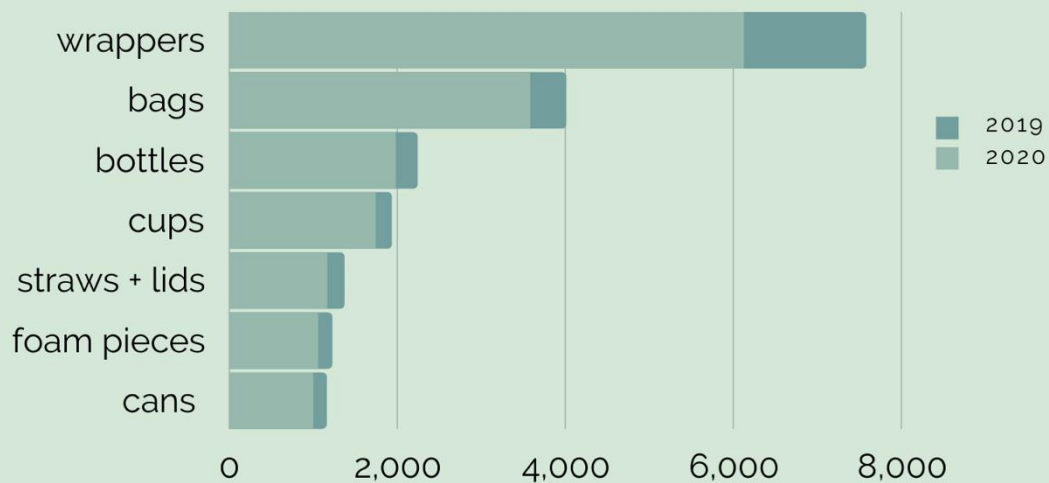
3,402
KG TRASH



14.7
HECTARES CLEANED



367
VOLUNTEERS



Ecological Health Concerns

Plastic waste is ubiquitous in the environment, its harms to nature, wildlife, and human health is endless and its effects on freshwater systems (Earn, Arielle & Bucci, et al., 2020) and Junction Creek is no exception.

Litter and plastic waste have become common environmental issues in urban watersheds. It is aesthetically displeasing, impairs water quality, degrades habitats, and can be life threatening to many types of wildlife. For example, both macroplastics (>5mm) and microplastics (<5mm) pose a health risk to aquatic animals, including many that reside in Junction Creek like fish, turtles, and birds because of possible entanglement and ingestion (Erdie, 2018). Plastic waste in particular can persist in the environment for thousands of years, breaking apart into tiny pieces known as microplastics and leaching harmful substances which bioaccumulate in the food-chain (Junction Creek Stewardship Committee, 2019).

Understanding the extent and source of litter in the Junction Creek watershed is the first step to taking action to reduce litter and plastic waste from entering the creek and other fresh waterways. It is believed that the highest concentrations of plastics that enter fresh water systems are within our wastewater and urban runoff and therefore, well within our control (Earn, Arielle, Bucci, et al., 2020; Erdie, 2018). As we continue to develop our understanding of where the plastic is coming from, we must also look at how we 'turn off the tap' to prevent it from happening in the first place. It is our hope that data collected over the long-term litter monitoring and inventory program will reveal trends to tailor effective remediation methods specific to Junction Creek, but can likely also be applied to similar water systems.



Recommendations to Reduce and Mitigate Plastic Waste in Greater Sudbury

1. **Education and awareness.** Continue targeting social media to increase awareness about plastic waste issues in local waterways. Specifically, share results from this project to increase awareness about the types and quantity of plastic waste and litter we are removing from the creek. Resources permitting, target advertisement in newspapers, radio, and televised news to reach more demographics.
2. **Long-term monitoring.** Continue conducting litter monitoring and plastic waste inventories at clean-ups. From the questionnaire, we saw that Sudburians are concerned with plastic waste in the creek but are not familiar with the extent of it. This data will help raise awareness and accountability for the plastic waste littering the watershed and hopefully encourage the community to take action.
3. **Community Clean-ups.** Enhance clean-up programs to expand reach and make resources more accessible. By creating an online platform for clean-ups, volunteers would be able to register a clean-up, access safety protocols and waivers, and track the litter they remove. Tally sheets with the items we typically collect would be available for download and re-uploaded upon completion of the clean-up. These resources will not only free up PFGS's volunteers but will also facilitate community groups interested in becoming stewards for sections of Junction Creek in their neighbourhood through the Adopt-a-Creek program.
4. **Collaboration opportunities with stakeholders.** Most of the litter found at clean-ups were from nearby restaurants and businesses. For example, branded cups, food wrappers, and bags. Opportunities to work with stakeholders include the following:
 - a. Share clean-up results, knowledge and raise awareness with local businesses, discussing recommendations to reduce waste.
 - b. Consider partnering with those businesses to sponsor clean-ups in their neighbourhood and/or have their staff volunteer at these clean-ups.
 - c. Create targeted educational resources and materials, such as signage for inside their business.
5. **Mitigation.** Reducing single-use plastics should be considered first and foremost; if we use less plastic there will be less plastic litter. Continue educating the public to reduce plastic consumption through informative outreach with captivating videos, photos, and graphics. Mitigation strategies to prevent plastic waste from entering the waterways include more waste disposal bins along the trails, enhancing the riparian buffer by planting more vegetation along Junction Creek, and capturing litter in stormwater by installing trash traps. A mitigation strategy to capture and safely remove litter from Junction Creek, preventing it from continuing downstream into lakes and oceans, would include installing trash booms in targeted hot-spots where large amounts of in-stream litter tend to accumulate. For more details on recommended mitigation strategies for Junction Creek, please contact info@junctioncreek.com.

References

Bucci, K., Tulio, M., Rochman, C.M. (2019). What is known and unknown about the effects of plastic pollution: a meta-analysis and systematic review. *In press at Ecological Applications*.

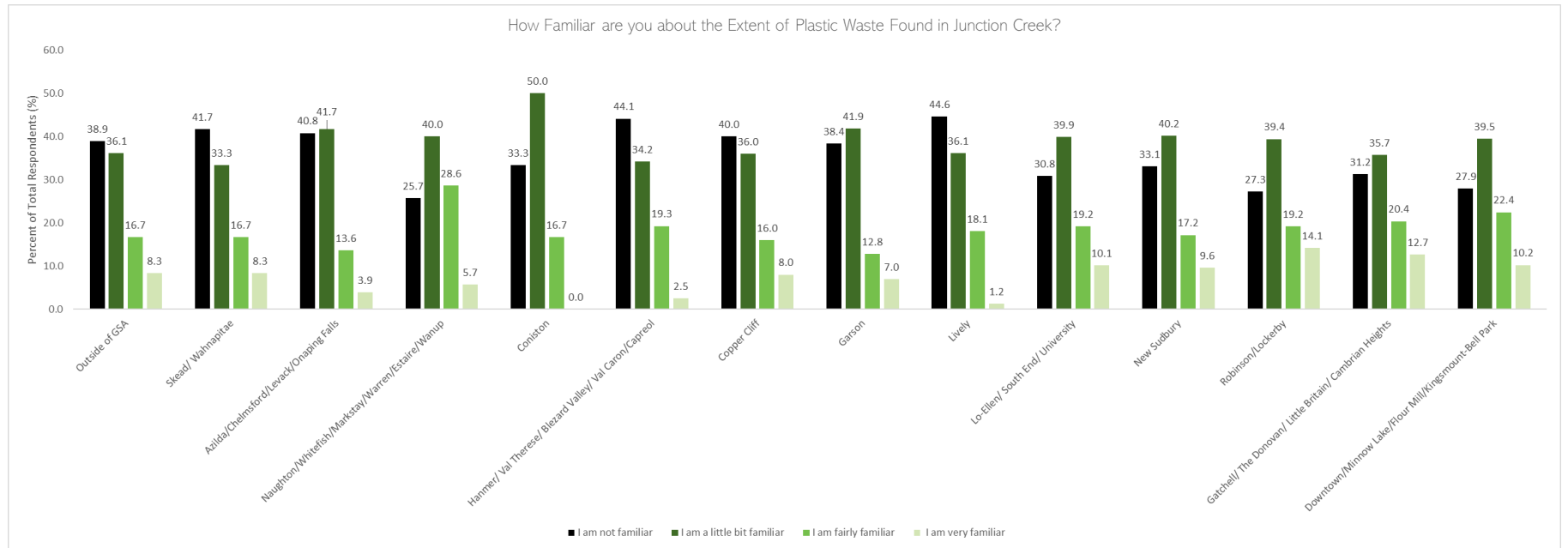
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Earn, A., Bucci, K., Rochman, C. (2020). A systematic review of the literature on plastic pollution in the Laurentian Great Lakes and its effects on freshwater biota. *Journal of Great Lakes Research*.

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Appendix A: Familiarity of plastic waste in Junction Creek based on location in Greater Sudbury



Appendix B: Plastic Waste Inventory from 2019 and 2020

DATE	KG OF TRASH	AREA M ²	# OF HELPERS	TOP 3 ITEMS
New Sudbury – New Sudbury Centre				
April 28, 2019	225	9,922	44	Cups, Wrappers, Bags
Oct 3, 2020	77	11,470	33	Wrappers, Bags, Cups
New Sudbury – Lasalle Superstore				
May 4, 2019	624	7,625	60	Cups, Wrappers, Bags
Flour Mill – Mountain St. to Leslie St.				
July 10, 2019	492	5,309	15	Bottles, Wrappers, Bags
Aug 16, 2019	126	5,309	12	Cans, Wrappers, Bags
Oct 13, 2020	137	16,540	12	Bottles, Bags, Wrappers
Little Britain – Saint Catherines St. to Saint James St.				
July 30, 2019	53	6,172	12	Bottles, Wrappers, Bags
Little Britain – St Francis Catholic School/along Lilac Street				
Nov 9, 2020	58	3,594	5	Bottles, Styrofoam
Flour Mill – Agnes St. to Leslie St.				
July 10, 2019	153	5,211	16	Bottle, Wrappers, Cans
Gatchell – West of Martindale St.				
Aug 28, 2019	27	2,658	3	Bottles, Wrappers, Fragments
Flour Mill – Perrault St. to King St.				
Aug 28, 2019	357	4,138	20	Bottles, Wrappers, Bags
Sep 24, 2020	152	14,000	13	Wrappers, Cups, Bags
Little Britain – Riverside Dr. to Regent St.				
Sept 23, 2019	75	2,214	9	Bottles, wrappers, bags
Oct 4, 2020	128	12,058	23	Wrappers, Bags, Styrofoam
New Sudbury – Madison Ave. to Lansing Ave.				
Oct 3, 2019	104	21,088	16	Bottles, wrappers, bags
New Sudbury – Fielding St. to Barrydowne Rd.				
Oct 5, 2019	280	5,300	50	Shopping carts
Oct 20, 2020	334	14,300	24	Wrappers, Bags, Bottles

Thank you to our supporters

The Junction Creek Plastic Waste Awareness Report 2019-2020 was created as part of the “Reducing Plastic Waste in Urban Waterways” project. This is a multi-year project in partnership with Junction Creek Stewardship Committee designed to address the issue of plastic waste and litter in Greater Sudbury’s central urban waterway, known as Junction Creek. The project will enhance creek clean-up and monitoring methods to: further evaluate litter and plastic waste accumulation, identifying litter ‘hot spots’ and potential sources, raise awareness in the community, and provide recommendations for mitigation and continuous education.

Thank you to all the volunteers that participated in the clean-ups and improved the health of Junction Creek and the Greater Sudbury community! Support for this project and clean-up activities in 2020 were provided by:

This project was undertaken with the financial support of the Government of Canada.

Ce projet a été réalisé avec l'appui financier du gouvernement du Canada.

Canada



For more information about single-use plastics in Greater Sudbury visit:
plasticfreegreatersudbury.org or junctioncreek.com

Contact us at **pledge4sudbury@gmail.com or info@junctioncreek.com**

**PLASTIC-FREE
GREATER SUDBURY**



*Junction Creek
Stewardship Committee*

*Comité d'intendance
du ruisseau Junction*