NEW BRUNSWICK'S

WASTE REDUCTION AND CIRCULAR ECONOMY JOURNEY

Paige Morgan
Conservation Council of New Brunswick

New Brunswick's WASTE REDUCTION AND CIRCULAR ECONOMY JOURNEY

Paige Morgan,
Conservation Council of New Brunswick

Conservation Council of New Brunswick

180 St. John Street
Fredericton New Brunswick
Canada E3B 4A9

T. (506) 458-8747
E. info@conservationcouncil.ca
www.conservationcouncil.ca

/conservationcouncil /cc_nb

New Nouveau Brunswick
Your Environmental Trust Fund at Work
Votre Fonds en fiducie pour l'environnement au travail

This report was produced with support from New Brunswick's Environmental Trust Fund.

March 2023

NEW BRUNSWICK'S
WASTE REDUCTION AND
CIRCULAR ECONOMY JOURNEY

Table of Contents

01 Executive Summary

The way we make things has to change.

The traditional linear economy follows a 'take-make-waste' mentality, assuming the planet will provide infinite raw materials for whatever our communities need. But we know resources are not unlimited. And we know a linear economy has contributed to a lot of problems for the environment and atmosphere: pollution causing climate change and extreme weather, rampant clearcutting of forests and mining of land driving species loss and extinctions, and a seemingly endless, overwhelming barrage of garbage filling landfills, littering our communities, leaching into our parks, forests, rivers, and oceans.

One solution to addressing these problems is changing the way we make things: switching from a linear economy to a circular economy. A circular economy is an integrated model that involves planning from a whole economy scale and looking for opportunities to create closed-loop production cycles within and across all sectors of the economy.

Starting this year, New Brunswick is taking one of the first big steps in this journey: implementing the new Extended Producer Responsibility (EPR) policy for plastic, paper and packaging. This policy puts the collection responsibility on producers rather than municipalities.

When British Columbia began its EPR for plastic, paper and packaging, the new collection infrastructure was a milestone in growing the province's waste reduction strategies. That was seven years ago and currently British Columbia diverts 67 per cent of all its waste from the landfill back into other materials and products—the highest diversion rate in Canada.

*New Brunswick is implementing the new **Extended Producer Responsibility (EPR)** policy for plastic, paper and packaging.*

We believe New Brunswick's EPR for paper, plastic and packaging could lead to the same success if supportive measures are taken. This report reviews all 12 waste management regions in New Brunswick, called Regional Service Commission (RSC), and conducts a jurisdictional scan of leading circular economy or waste reduction programs from other Canadian provinces and territories.

We provide recommendations for the province as a whole and tailored recommendations for each of the 12 RSCs in hopes of helping New Brunswick's effective transition to a circular economy.

Report Layout

This report proceeds as follows. The methodology will detail how this report is built and where the information was sourced. From there, a background will be given on circular economy and the metrics used in this report to measure a community's progression away from a linear economy.

Once the context of what we are looking for is given, the following section will summarize New Brunswick's waste management infrastructure and how this infrastructure is performing using the waste reduction and circular economy metrics described earlier.

The second section will build on our understanding of New Brunswick's waste management infrastructure with how it is performing using the circular economy metric. The section will start with a summary of New Brunswick's best waste management practices and recommendations on how those results can be seen all over the province. After this summary, each region will be given a profile of all the current programs, public education methods, challenges and successes found in each waste management region.

The third section will compare our research on New Brunswick with other jurisdictions in Canada. Like the second section, a summary will overview the best waste management practices found in these provinces that could assist New Brunswick. A profile detailing these provincial programs will follow.

The final section will pull from the knowledge of the best waste management practices in New Brunswick and other Canadian jurisdictions to analyze the industrial waste in our province. We chose to research New Brunswick's two largest industries, fisheries and agriculture. Since the goal of a circular economy is to include business and industry into the discussion of waste reduction in the community—rather than just residential waste as it is currently focused on—we investigated current successes and struggles of this industry to determine their progress in waste reduction and movement toward a circular economy.

02 Methodology

We primarily used the tools of desktop research and in-person or phone interviews to conduct our research for this report. In addition, a previous study by the Conservation Council of New Brunswick assisted in deciding how to best analyze New Brunswick's waste management practices.

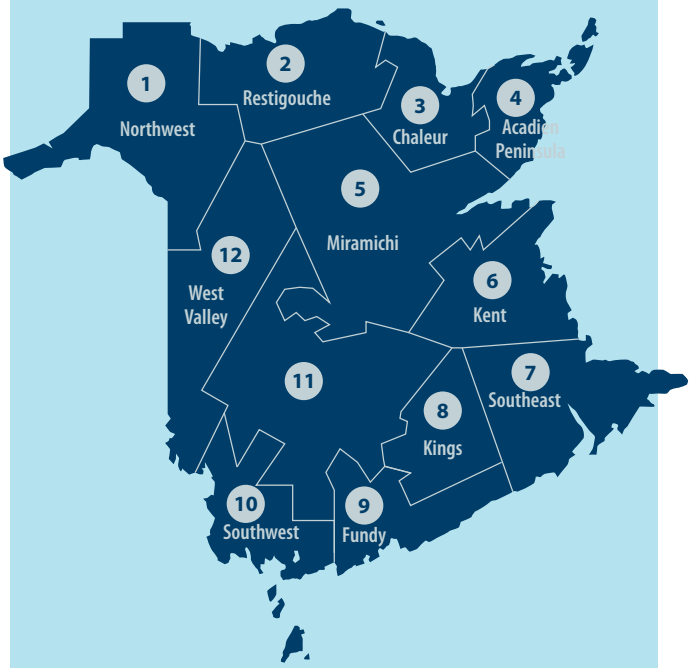
In October 2022, the Conservation Council of New Brunswick performed a telephone survey with 250 New Brunswick residents concerning their knowledge of recycling and waste diversion. Survey results found a significant discrepancy between rural and urban residents. In addition, residents located in the northern and southern parts of the province were different when it came to participation and knowledge of local waste diversion programs. It is for this reason that we chose to analyze New Brunswick's waste management practices by examining and comparing the 12 Regional Service Commissions. This way we could see the different problems each region faces.

To conduct our research, we completed a total of 12 interviews:

- Business Owner (1)
- Leaders in Sustainable Fishery Advocacy (2)
- Agricultural Professionals (2)
- Waste Management Professionals (6)
- Waste Reduction Advocacy Group (1)

A list of all the interviews for this report can be found in Appendix A.

More than 60 articles from non-profit and government websites, Statistics Canada, waste reduction programs, and more were reviewed in addition to 28 government and peer-reviewed publications.



12 Regional Service Commissions

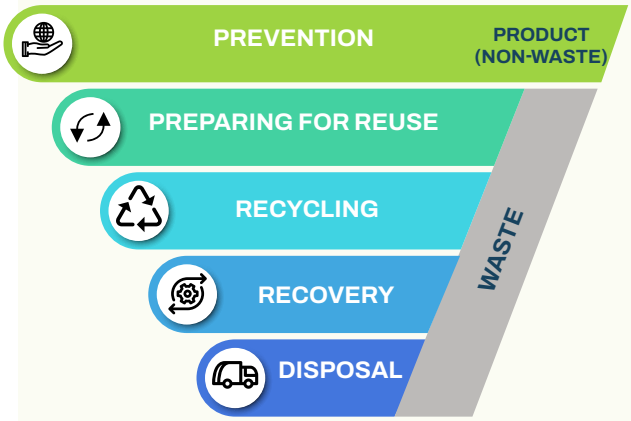
12 Interviews

03 Introduction

This research dives into New Brunswick's current educational materials on waste reduction efforts and its progression toward developing a circular economy. Figure 1 shows the 'waste hierarchy principle' as the European Waste Framework Directive described it in 2008. There are a lot of variations of this diagram, but the overall goal is for consumers, businesses and industries to prioritize the first step of 'prevention' with the last step being 'disposal.'

Figure 1

Waste hierarchy principle

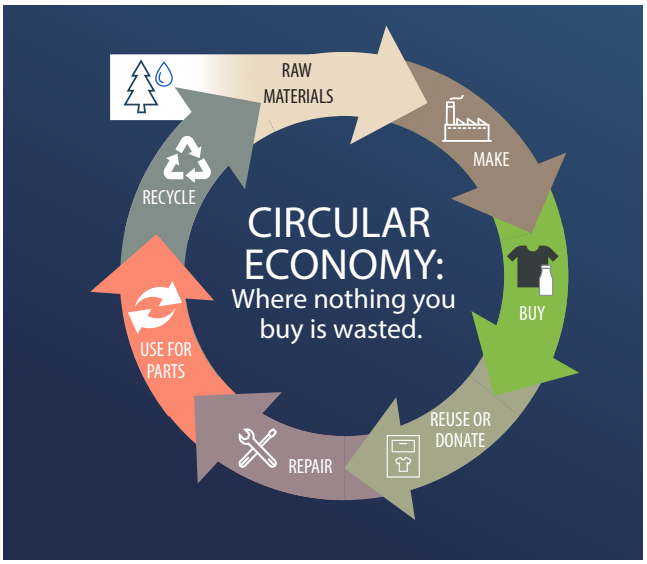


In an interview with Chris Underwood, a member of the Metro Vancouver team who is responsible for starting the National Zero Waste Council, Underwood said the waste hierarchy principle can also be used in community-wide waste management planning. For example, as the public becomes more informed, infrastructure of collection improves, and policies are in place to reward waste reduction practices—these changes move a community up the waste hierarchy. This tool will be used as a metric later in the report to compare New Brunswick with other provinces in Canada.

While waste hierarchy can be used for strategy and measuring community progress, circular economy is the overarching umbrella concept that uses multiple tools and policies to improve waste reduction, pollution, and efficiency of materials.

Linear Economy Vs. Circular Economy

Most North American jurisdictions, including New Brunswick, have a linear economy, which considers waste, pollution, and overconsumption of materials as just an outcome of business. Some call it the 'take-make-waste' mindset.



A circular economy is much more interconnected than our current economy, which encourages independent growth. The Ellen MacArthur Foundation, an international leader in circular economy advocacy, has great resources and videos describing the differences between a circular economy and a linear economy. Simply put, a circular economy is like a large-scale ecosystem of infrastructures where a focus is given to material efficiency, including energy generation throughout its production cycle, and distribution. It should integrate different industries to maximize efficiency and minimize material and energy loss in the process.

As the Ellen MacArthur Foundation describes, the primary goal of a circular economy is to reduce waste and pollution and conserve virgin materials. Studies have found that the pressure on biodiversity decreases when the consumption of virgin resources is reduced. While a challenging transition requiring participation and collaboration among many sectors of society, a circular economy helps mitigate the effects of climate change and reduce the annual consumption of raw materials.

Metrics like diversion rate and recycle rate are used to determine the progression of a community's transition from linear to a circular economy.

The diversion rate refers to the "proportion by weight of all material diverted from disposal (e.g., landfill or incineration) to the total mass of all waste material generated, expressed as a percentage." As the diversion rate grows, it shows the percentage of 'waste' that is being given another use outside of burying or burning it at a landfill. Diversion rate can include any waste that would have gone to the landfill like organic waste, automotive parts, computers, construction materials, etc.

Recycling rate is the end-of-use materials that residents usually put in their recycling bin at home. Materials that are recycled are being melted down or chemically processed in order to be made into new materials. Recycling therefore requires much more energy than a method that reuses, repairs, or repurposes that item. For example, glass can either be melted down at around 1,700°C, or it can be repurposed by being broken down into different sized pieces and made into sandblasting material, fiberglass, or even countertops. This process requires a lot less energy.

A key goal of a circular economy is to reduce waste by continuing the cycle of reusing resources again and again, ideally in their original state, to conserve energy, but also after they've been recycled. As the diversion and/or recycling rate increases, a community prevents more and more waste and moves up the waste hierarchy. This report will use diversion and/or recycling rate as a metric to compare the waste reduction efforts within communities in New Brunswick.

As an example, even though this concept is relatively new in North America, countries like South Korea have been practicing circular economy principles for almost two decades. In 2005 the country introduced a ban on sending organic waste to landfills. In 2013 it began imposing fees on users for non-compliance. A combination of public education and policy have driven the growth of a circular economy in South Korea, resulting in a 95 per cent diversion of food waste in 2022, with liquid food scraps made into biogas and solid scraps used as livestock feed.

New Brunswick's Infrastructure

Landfill bans and enforcement fees are just some of the tools and policies that help communities transition to a circular economy. One strategy being used by New Brunswick is the **Extended Producer Responsibility Policy** (EPR).

In an EPR, waste commissions work with municipalities, businesses and industries to build the collection infrastructure necessary to gather products once they leave the hands of customers. EPR puts companies legally responsible for collecting a certain percentage of their post-consumer goods instead of relying on residents to properly recycle or municipalities to collect it as trash. It transitions the burden upstream in hopes the producers will design a higher percentage of reusable products for their packaging and merchandise to be used over and over.

Policies like EPR are one of the primary tools of a circular economy because they provide dedicated, ongoing, and sufficient funding while also returning a reliable supply of products back for producers to reuse. New Brunswick currently has three EPR policies—for paint, oil, and electronics—and one stewardship program for tires. It is currently working on its fourth EPR for paper, plastic and packaging. The provincial non-profit organization RecycleNB oversees the EPR and stewardship programs.

New Brunswick's 12 Regional Service Commissions (RSC) are responsible for the day-to-day management of our waste. These responsibilities include the collection of all post-consumer goods like trash, recycling, compost and hazardous waste, in addition to supporting public education efforts for waste reduction in their region. This is a more challenging task in New Brunswick than other Canadian jurisdictions because all services must be bilingual and the collection infrastructure must be delivered to primarily rural, low-density residents. In 2021, **Stats Canada** recorded that 49 per cent of New Brunswick's population was considered to live in rural settings. This means more traveling and vehicle maintenance for the RSCs with less quantity of materials collected, increasing service costs greatly.

04 A Review of All 12 Region Service Commissions

Best Practices within New Brunswick

Unsurprisingly, the four RSCs in the province that are collecting compost also have the highest diversion rates. This is also attributed to these communities—Kent RSC 6, Southeast RSC 7, RSC 8, and Fundy RSC 9—having effective public communication and outreach programs.

Kent RSC 6 had an impressive 59.4 per cent of waste diverted from the landfill and given a new purpose. As a comparison, most regions have a diversion rate of around seven to 15 per cent. Kent is a leader in best management practices for circular economy and waste reduction.

Southeast RSC 7 is going above and beyond when it comes to community events. Its Mobile Eco-Depot visits a new location within the region every week for two days. It also has a Reuse Expo event twice a year at the Moncton Coliseum where community members can drop off reusable items to 15-20 non-profits/community partners who use the items for their programs. Southeast is a leader in best management practices for community support and outreach.

RSC 8 is one of the few regions assisting its local businesses with waste reduction. Waste reduction support for the agricultural sector is lacking in this province, as we discuss later, but RSC 8 has an education and agricultural plastic collection program that is unique to its region. RSC 8 is a leader in best management practices for business support in waste reduction.

Fundy RSC 9 is the best financially-designed RSC to optimize its public education campaigns. Not only does it have a unique interpretive centre, but it makes sure 80 per cent of all Grade four students in the region receive a class visit or educational materials. It also brings Grade 7 and 11 classes for tailored tours of RSC facilities. Fundy is a leader in best management practices for educational materials and programs.

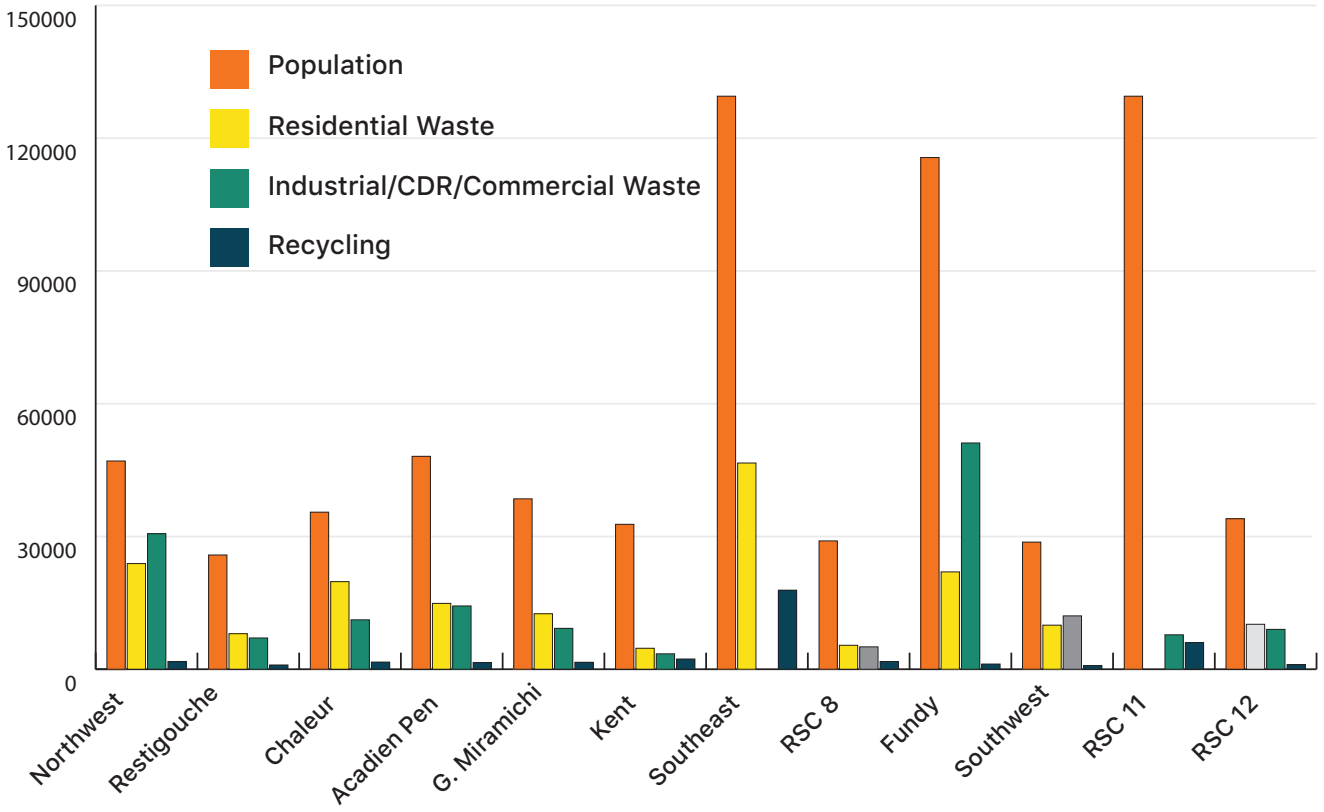
Fundy RSC 9 interpretive centre

There are two other regions to highlight. Chaleur RSC 3 was the only region to harness the marketing power of local celebrities in its recycling outreach campaigns, using the local hockey team. Meanwhile, Greater Miramichi RSC 5's social media posts pushed circular economy messaging of reducing your consumption, donating reusable items, and even starting your own compost pile.

It is important to note, however, that some RSCs told us it's difficult to maintain a composting program as it can be costly and challenging to find a consistent buyer for the final compost product. These RSCs argue that organic waste can be collected in garbage for conversion to biogas captured once the landfill cell is capped.

The following recommendations are based on best practices and successes observed from N.B.'s 12 RSCs and programs in other jurisdictions. These encompass overarching strategic goals for the province to stride toward in leading us toward greater diversion rates, more public awareness around a circular economy, and program participation. There are also recommendations tailored to each RSC region in their individual sections. This list is not in order of priority.

Figure 2. Waste Profile for Each Region



Note: All materials above arrived at the RSC landfill site. New Brunswick has private landfills and construction waste drop-off sites which are not accounted for in this graph. This graph counts Clean CDR as waste due to it being at the landfill without use. All residential waste is from the households within the regions. Details can be found in Appendix B.

Recommendations for the provincial government

Changing from a linear to circular economy won't happen overnight. It requires leaders and stakeholders from as many sectors of a region's economy and stage of supply chains to participate in building closed-loop systems that are efficient, productive, conserve materials and reduce waste. There is no one-size-fits-all-approach, but legislators can use several policy levers, from strategy development to capacity building, economic incentives to regulation, to promote, facilitate and enable a circular economy. The following are our recommendations to government for advancing a circular economy in New Brunswick:

Develop a comprehensive circular economy strategy

New Brunswick should develop a comprehensive circular economy strategy that sets clear goals, targets, and action plans for transitioning to a circular economy. This strategy should involve collaboration between government, industry, and other stakeholders to ensure buy-in and implementation.

Support circular economy innovation

New Brunswick should support and invest in circular economy innovation by providing funding, tax incentives, and other financial support to entrepreneurs, start-ups, and established companies that are developing and implementing circular economy solutions.

Build circular economy infrastructure

New Brunswick should invest in circular economy infrastructure, such as recycling facilities, waste-to-energy plants, and material recovery facilities, to create a more robust and efficient circular economy. This infrastructure should be designed to recover, reuse, and recycle as much waste and resources as possible, reducing the need for virgin materials.

Promote circular economy education and awareness

New Brunswick should promote circular economy education and awareness to businesses and consumers. This can include developing educational programs and resources that explain the benefits of a circular economy and how to implement circular economy practices in business operations and daily life.

Foster circular economy partnerships

New Brunswick should foster partnerships between government, industry, academia, and other stakeholders to promote circular economy development and implementation. These partnerships can facilitate collaboration, knowledge sharing, and the exchange of best practices, accelerating the transition to a circular economy.

Provide assistance for RSCs before the new EPR for packaging, paper and plastic

New Brunswick is at a turning point of waste reduction and transition into a circular economy thanks to the upcoming EPR for plastic, paper and packaging. Regional Service Commissions should be given adequate support during this transition, including:

- Information on how collection routes will be affected;
- How this new policy will or will not affect RSC financials, by far the largest concern expressed; and,
- How government and third-parties will assist in educating the public with this new policy and what it means for RSC customers.

Recommendations for the Regional Service Commissions

Equal focus on business and industry waste diversion

Industrial, commercial, and construction, demolition and renovation (CDR) waste accounts for at least half, and sometimes more, of each RSC's waste. But there is very little program support given to industries to help reduce, reuse and recycle. RSCs have key insight into the materials entering waste streams and should play a big role in finding opportunities for closed loop systems. New Brunswick should deploy tools such as material flow analyses to understand the circular economy potential of our commercial and industrial sectors.

More collection events for hazardous waste and bulk items

Holding more public collection events makes it easier for residents to properly dispose of a range of products. We recommend expanding collection events for hazardous waste and bulk items, particularly those covered under existing EPRs and stewardship programs for electronics, used oil, glycol, and tires. These events could also help RecycleNB hit its recovery rate goals for products such as paint containers and used oil containers.

Both RSC 11 and Southeast RSC 7 have the same population, yet RSC 11 hosted three collection events in 2021 while Southeast RSC hosted 50. New Brunswick's EPR data is difficult to track due to its paper recording system, but Luc Gagnon of Atlantic Used Oil observes a correlation between collection event frequency and increased EPR product collection. RSC 11's collection (three public events) for 2021-2022 of plastic oil and glycol containers was 2,871 kilograms, while Southeast RSC 7's collection (50 events) for 2021-2022 of plastic oil and glycol containers was 8,600 kg.

For the three largest regions—RSC 7, 9, 11—we recommend providing at least 12 to 20 collection events per year. For smaller regions, five to eight events leads to higher public awareness and participation.

Increase school visits/tours

Introducing students to the concept of a circular economy and how waste management works in their region will help increase participation in RSC programming. As demonstrated by Fundy RSC, regular visits to RSC facilities should be factored into education planning and spending.

Go more in-depth with education platforms

Social media provides RSCs a direct line to many residents in their community. RSCs should take greater advantage of social media to inform residents of local waste reduction tools and programs. Highlighting local events, thrift stores or other circular economy assets like repair shops could help residents keep waste reduction at the forefront of their mind.

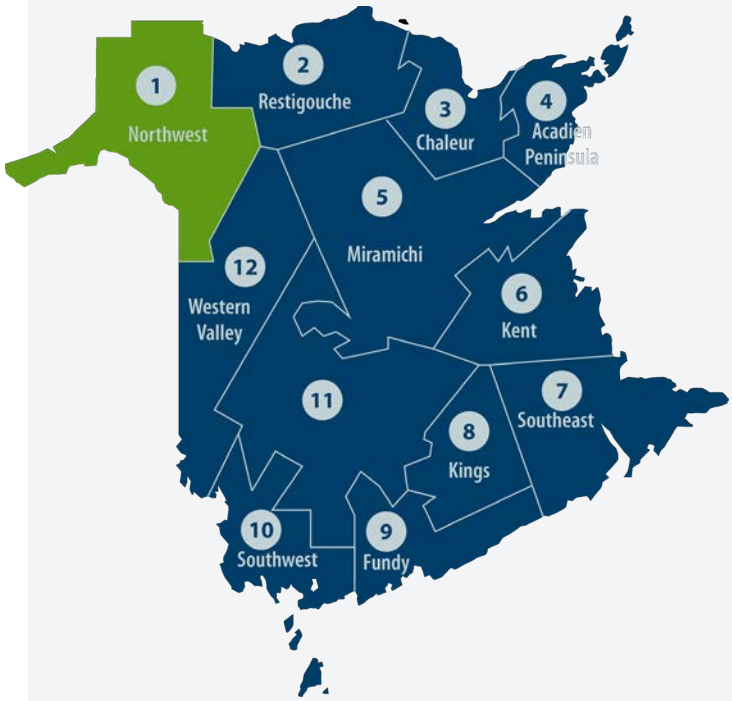
Work smaller, not bigger

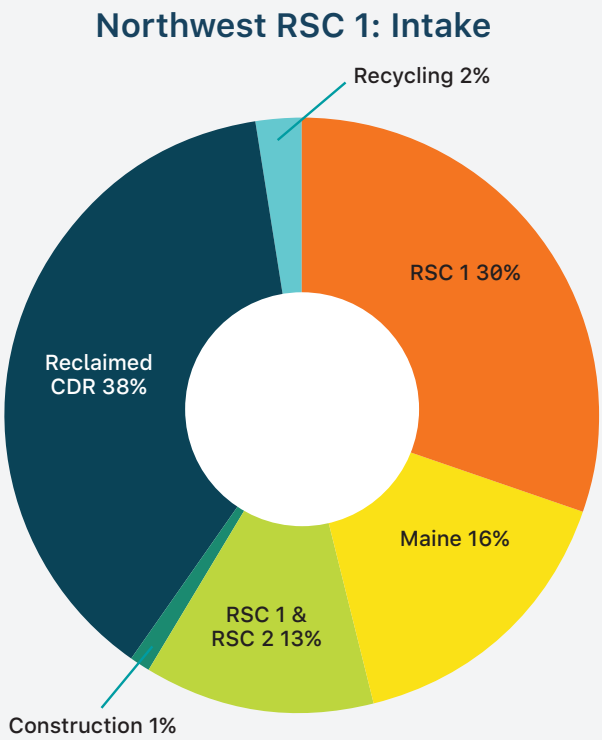
Half of New Brunswick's residents live in a rural setting. Strategizing a waste management plan tailored to assist small towns will lead New Brunswick to a circular economy sooner and with more grassroots strength. Banff, Alberta, with around 8,000 residents, provides a great example, as this report discusses later.

Make all materials and platforms bilingual

New Brunswick is a bilingual province. Each region should provide educational materials and platforms in both official languages to allow the entire community to interact and participate in New Brunswick's circular economy journey.

05 A look at each region





Northwest Regional Service Commission 1

Regional details

Northwest RSC 1 is the fifth largest of all 12 RSCs, with roughly 47,053 residents living in its service area.

This region is primarily rural, and the services extend across the border to its neighbor Maine, RSC 2, and half of RSC 12. All four regions use the Montagne de la Croix sanitary landfill, which is currently at 20 per cent capacity.

Northwest held five hazardous waste collection events and kept an average of 30 per cent contamination rate of its recycling, according to its 2021 annual report, the latest available. The higher the contamination of the recyclables received, the more sorting and therefore money lost to an already low revenue stream.

This RSC receives a lot of construction, demolition, and renovation (CDR) waste. In order to conserve landfill space, non-hazardous waste like CDR are separated from the rest of the residential/industrial waste.

Normally, waste is sent to a landfill cell. A landfill cell is the trash burial site which is lined with multiple impermeable layers and drainage pipes to protect the water table while also collecting rainwater, which is pumped and transported to a sanitation pool for treatment. If materials like CDR do not need this process, they are sent to a different above-ground location at the landfill to conserve space in the cell.

New idea in the making

Even though this CDR material is currently sitting on site at the landfill, Richard Lebel, the Director of Ecological Management at Northwest RSC 1, is working on a way to use it.

> *"I have a longer vision of a project … what I am trying to achieve is to build a shredder that is run by biogas. I would shred those materials (CDR) and try to send it back to the hospital or universities where they have big boilers they use for biomass."*

Another energy recovery strategy Northwest RSC 1 is currently doing well is with its biogas generator. With 20 extraction wells, there is enough biogas gathered from the landfill to produce 1,869 megawatt hours (Mwh) of energy, which is close to 117 homes powered (16 Mwh/home) by the landfill.

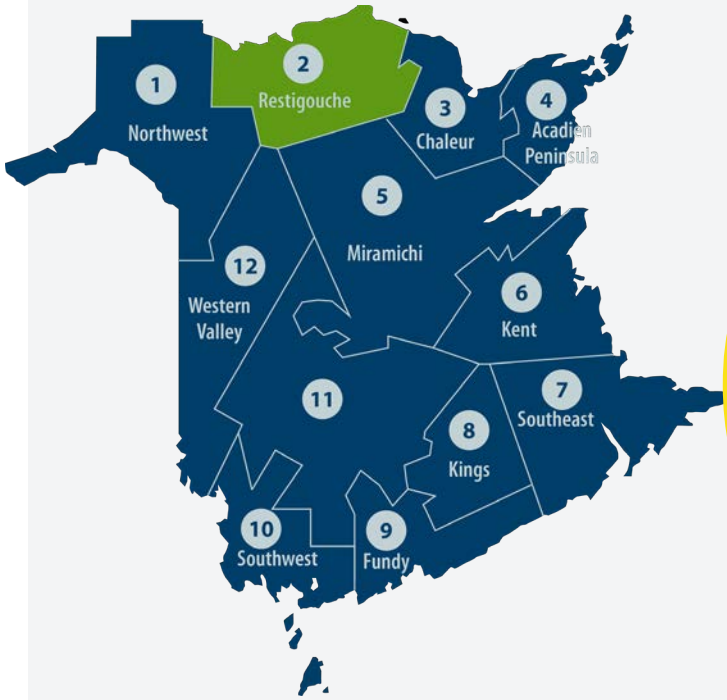
Public education and outreach

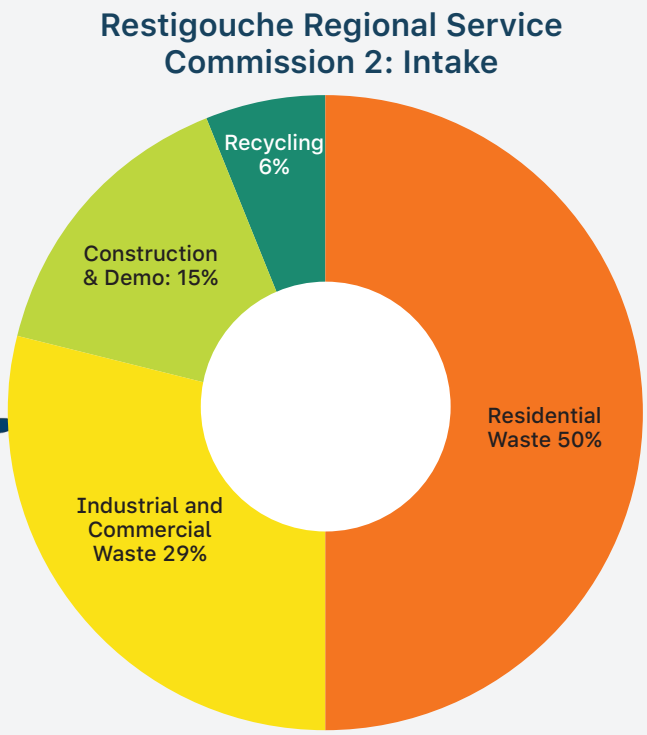
To adapt with the changes caused by the COVID-19 pandemic, Northwest RSC used the help of an app and social media since in-person

events like workshops had to be cancelled. According to its 2021 report, the mobile app is used by 84 per cent of visitors to their social media. Fifty-eight per cent of users were English speakers while 42 per cent were Francophone.

An overview of the website and social media showed that the RSC is doing an excellent job communicating to both English and French users. All materials, except for a handful of videos or small forums were found in both languages. The social media content provided by RSC 1 was informative, high-quality, and posted regularly.

Northwest RSC 1 also has an education coordinator. Once the snow melts, buses full of kids will be at the landfill for educational visits at least once a week in the spring and fall. The educational coordinator also performs school visits.





Restigouche Regional Service Commission 2

Regional details

With a population of only 25,812 residents, Restigouche RSC is the smallest of all 12 RSCs. All the residential waste collected in this region is sent to Red Pine Landfill operated by RSC 3 with a small portion also going to the Montagne de la Croix sanitary landfill under Northwest RSC's jurisdiction.

Similar to RSC 1, this region is equal parts Francophone and Anglophone speakers, with the RSC's website noting the region has one of the highest rates of bilingualism in Canada.

Residents do not have compost pick-up but recycling is picked up once a week no matter where you live. In 2021, Eel River Dundee was the last community in RSC 2 to receive recycling pick-up, and now receives the service once a month with all other areas receiving bi-monthly pick-ups.

The recycling diversion rate of this region (total waste divided by collected recyclables weight) was quite high with Dalhousie at 15.7 per cent and Charlo and Tide Head at 15 per cent.

Public education and outreach

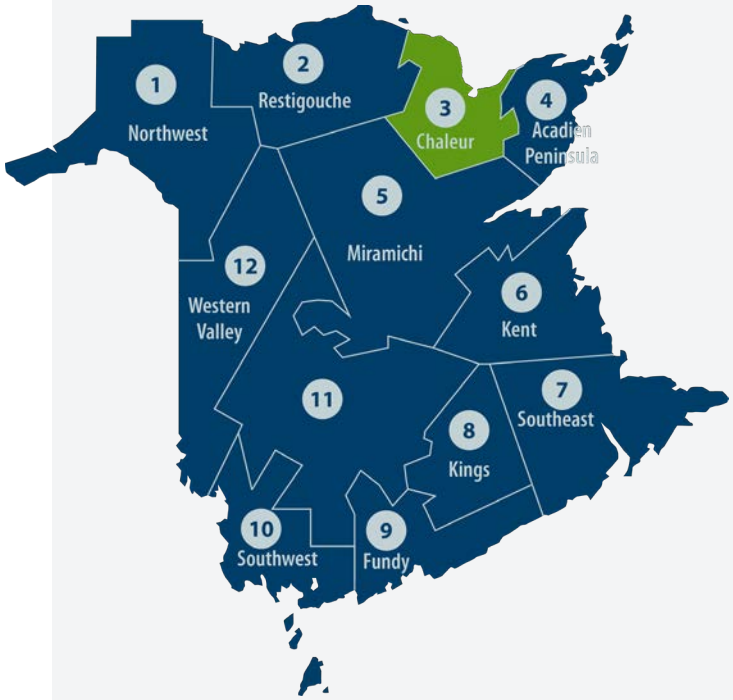
Restigouche RSC does an excellent job of communicating to both its French- and English-speaking residents. All materials, including their website, publications, and social media posts, are in both languages. This region's Wizard App gives detailed information for disposing of many materials, including hazardous waste drop-off locations, bulky items, and appliances.

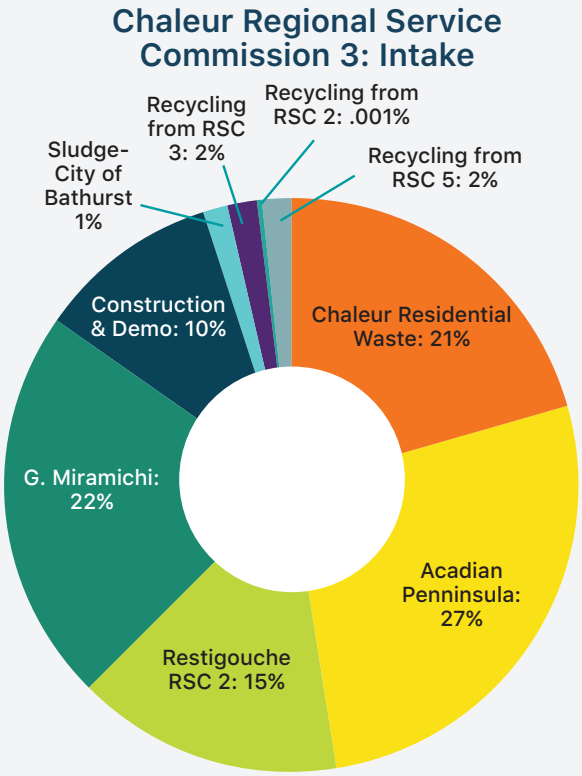
Even though this region does not offer compost collection, it makes efforts to highlight the province's composting handbook.

Recommendations

The social media page for Northwest is hard to find. Most RSCs have their social media linked to the bottom of their webpage to make it easy for residents to connect. We recommend making the page more visible to residents to improve engagement and post reach, as the page contains weekly, bilingual and informative posts.

This region could benefit from more public events. Recognizing that public health restrictions limited in-person outreach events, RSC 2 had only one hazardous waste and bulk item collection event while most RSCs had at least two, and the small region of Kent RSC 6 had eight.





Chaleur Regional Service Commission 3

Regional details

The Red Pine Landfill is run and maintained by the Chaleur RSC 3 in Allardville. This landfill helps provide waste disposal services to multiple regions including: Restigouche RSC 2, Acadian RSC 4, Greater Miramichi RSC 5, in addition to its own residents. Chaleur RSC 3 also accepts a portion of the recycling from RSC 2 and 5.

According to the RSC's latest annual report, the 35,489 residents of this region are 62 per cent Francophone and 38 per cent Anglophone. All educational materials, including publications, social media posts, and information on their website, are in both French and English.

Public outreach and educational programs

A unique program

Chaleur started a program in 2021 to raise awareness of and curb instances of illegal dumping. Phase one included audits and sign posting at potential illegal dumping sites. Phase two, which started in 2022, uses volunteers to begin clean-up of current illegal dumping sites and uses rented containers to collect waste to be brought back to the landfill.

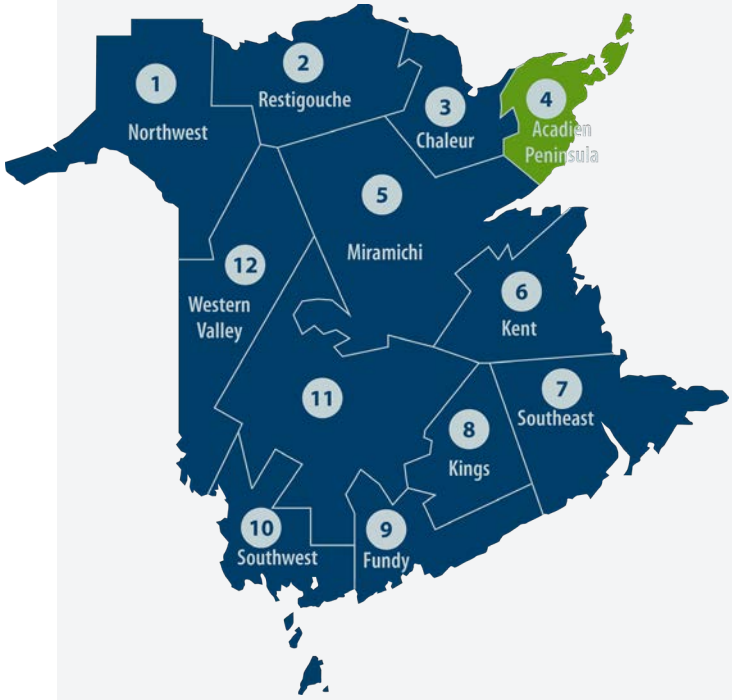
Social media

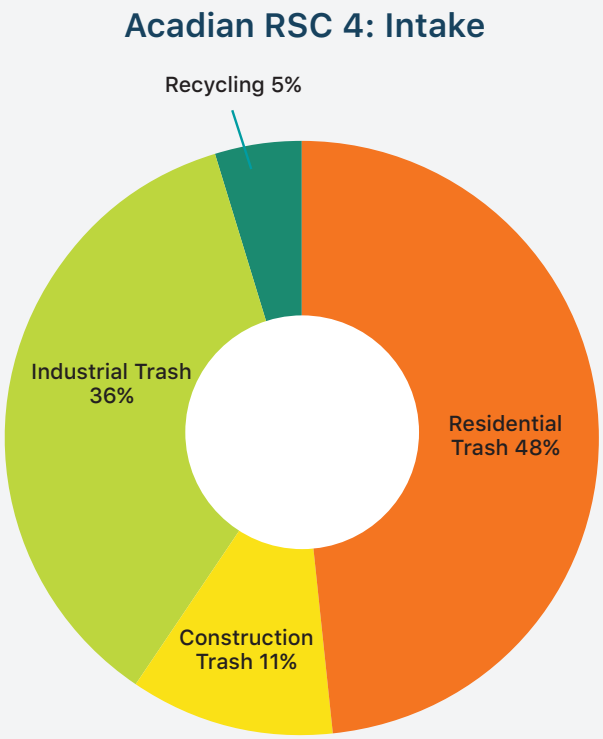
Another public outreach project that started in 2021 was the use of a local hockey team, The Acadie-Bathurst Titan, to create fun, educational recycling videos. These videos are played during hockey games in addition to being used for online campaigns. Chaleur RSC's Facebook is very active and its posts have some of the highest number of comments, shares, and likes of the 12 RSCs. Of those posts, hockey videos have the best feedback.

Recommendations

When using the region's online tool to find out where residential items should be disposed of, half of the items listed under the "Want to get rid of" section tell residents to call or email the office to find out the information. We recommend updating this portion of the website to increase the likelihood of residents disposing of waste properly and to help decrease call volume.

Chaleur would benefit from education materials and programs to improve waste reduction efforts in commercial and industrial sectors.





Acadian Peninsula Regional Service Commission 4

Regional details

Acadian Peninsula RSC residents are 96 per cent Francophone, three per cent Anglophone and one per cent 'other.'

The waste from this region's 48,108 residents is sent to Chaleur RSC 3. Its latest annual report detailed ongoing challenges of annual decreases of recycled ICI materials and a continued increase in recycling contamination (trash mixed in with recyclables).

Other RSC regions could be experiencing high contamination rates as well. There is little data online to better understand this problem. The Acadian Peninsula was the only RSC, however, to disclose its recycling contamination rate in its latest annual report, at 48 per cent.

During interviews with RSC 1, RSC 7, and RSC 9, representatives reported contamination rates between 15-30 per cent.

Public education and outreach

The social media interaction was very high for Acadian Peninsula RSC, with double the number of followers normally seen on RSC social media pages. Each post had at least one public interaction with some having more than 150 engagements. Due to the region's language demographics, most posts and materials are

provided in French only. Consideration should be given to providing bilingual materials, however, the higher priority should be increasing education outreach and waste diversion.

This RSC's website features a 'Recycling Wizard' app providing users with local drop-off locations but also prompts them to donate the item to a thrift store rather than disposing of it.

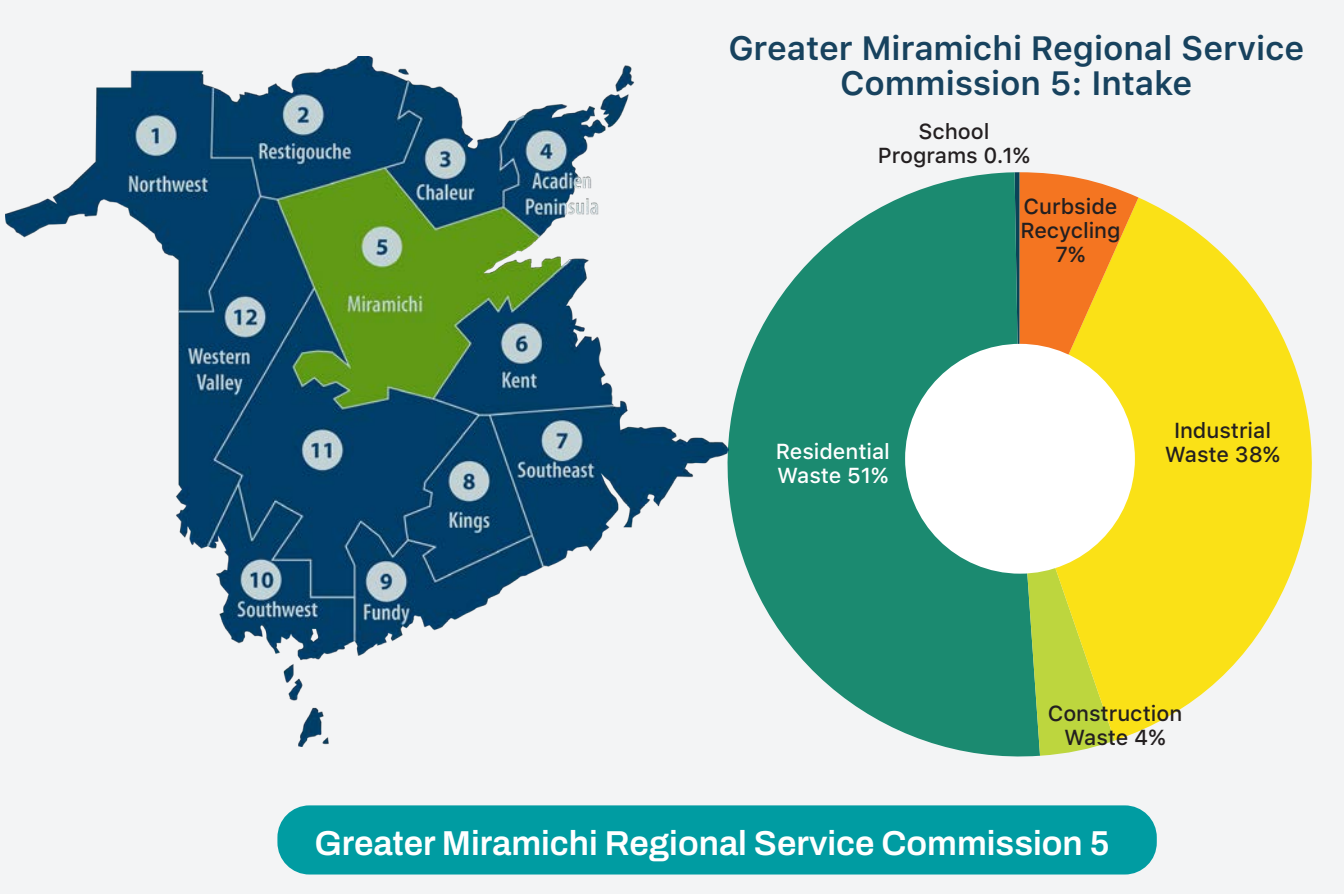
In 2021, two hazardous waste collection events were organized after a three-year hiatus. The 2021 annual reports stated that the quantity collected at these events exceeded original expectations, but it noted this was due to the lack of events for three years.

Recommendation

We believe a community's contamination rate is a tangible metric for the effectiveness of public education and service methods. For example, if a municipality is using a large container with a wide-mouth opening for a public-drop off site for recycling, there is going to be a much higher contamination rate than if that container had a thin slit opening to allow only small items like broken-down boxes and paper to fit.

Door-to-door recycling usually has a lower contamination rate but that is only if the education efforts are consistent with residents. Communities we've interviewed use bi-annual mailers, calendars, social media posts and even door-to-door audits of the recycling bins to reward and help residents learn about proper recycling. We recommend increasing education efforts if the primary method of recycling collection is door-to-door.

In addition, we recommend performing a waste audit of Acadian Peninsula RSC's recycling stream to find out if the primary cause of contamination is human error (mistakes by residents) or if contamination is occurring at collection sites.



Regional details

The Greater Miramichi Regional Service Commission 5 is partnered with Chaleur RSC 3 for the disposal of its waste and sorting of its recycling. The 38,507 residents are spread over 17 per cent of the total area of the province, making it the largest RSC.

Public outreach and educational programs

Schools

From 2020 to 2021, Greater Miramichi RSC saw a 23.8 per cent increase in the amount of recycling collected. Its 2021 annual report did not mention the direct cause of the increase, however, there is a lot of effort to reduce waste and collect recycling produced by local schools. Twenty out of 22 schools now have their own recycling carts. Schools diverted 18.7 tonnes of recycling in 2021.

Even though this is a small percentage of the 1,573 tonnes of recycling collected from the whole Greater Miramichi RSC, having thousands of students and staff reminded of waste reduction every day at school could lead to changes in at-home behaviors and/or purchasing actions.

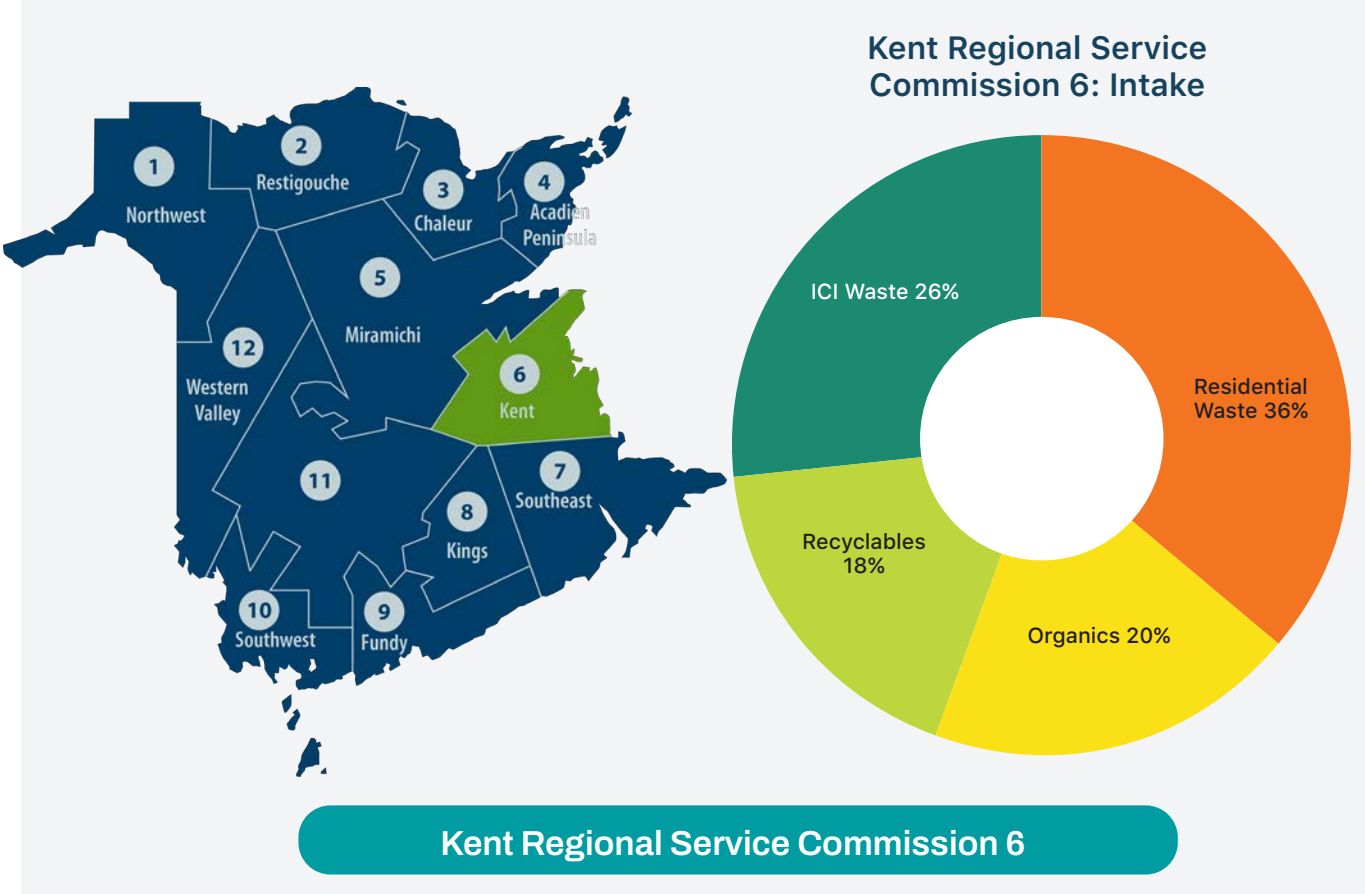
Social Media

Even though Greater Miramichi has a small following and relatively low interaction on social media, the messaging and information within the posts is the closest we saw to circular economy-driven messaging. Most regions use social media for waste pick-up changes and recycling efforts. This region's social media speaks on energy reduction, purchasing changes, reduce/share programs. All posts are bilingual.

Recommendations

The region only held two hazardous waste/bulk item collection events in 2021, one in Doaktown and one in Miramichi. We recommend increasing the amount of collection events in order to help prevent illegal dumping and hazardous waste from going into the landfill.

The social media page for the solid waste department should be highlighted more often to increase interactions and followers. The content was the most in-depth waste reduction information we've seen from the RSC's pages. We recommend linking the GMRSC Solid Waste Facebook page at the bottom of the RSC 5 website rather than the current GMRSC Planning or have the link change when you change to the solid waste web pages.



Regional details

Kent RSC 6 is the most rural RSC region in the province, with no community within the region housing more than 2,700 residents. Despite rural obstacles, Kent's diversion rates (material diverted from the landfill divided by the region's total trash) are the highest in the province.

Kent RSC 6 sends its waste and recyclables to neighbouring Southeast RSC 7. By partnering with Southeast RSC 7 the region is able to offer a 3-Stream Waste Recovery Program which only four out of the 12 regions practice: RSC 6, 7, 8, and 9.

The following calculations are the collection weights from the 2021 annual report. The numbers used are from Table 10.2 of the report, as Table 10.3's 'residential waste' number is the combination of waste, recyclables, and organic. The industrial waste amount was taken from Table 10.3 of the report.

Recycling Diversion Rate of: **48.7%**

(2,309 tonnes (t) of Recyclables/ 4,737t of Residential Waste)

Compost Diversion Rate of: 54.3%

(2,575t of Organics/ 4,737t of Residential Waste)

Total Diversion Rate: 59.4%

(2,575t Organics + 2,309t Recycling)/ (4,737t Residential and 3,485t Industrial Waste)

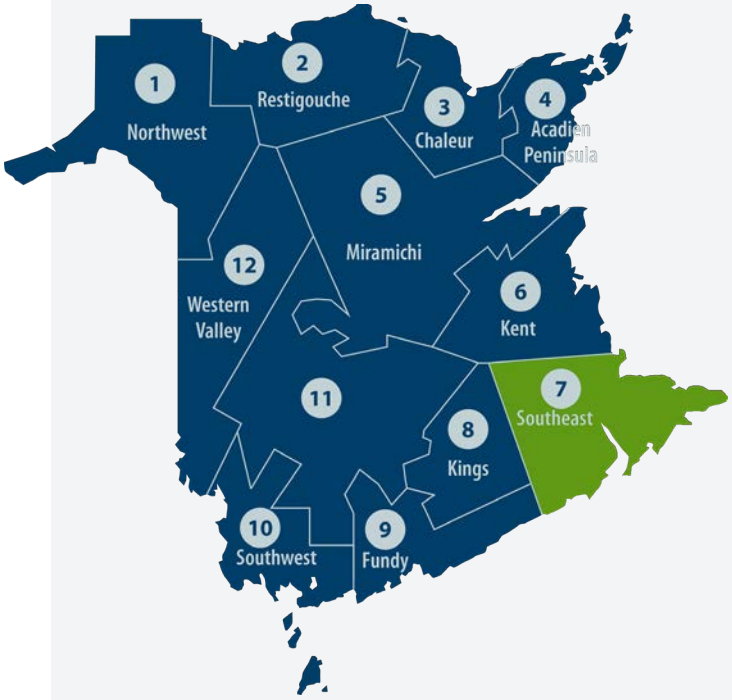
Currently this region offers weekly compost pick-up, with recycling and garbage on alternating weeks. The report does not state the percentage of contamination and if these collection weights include contaminated materials or not. All the same, the diversion rates show a great start toward a circular economy.

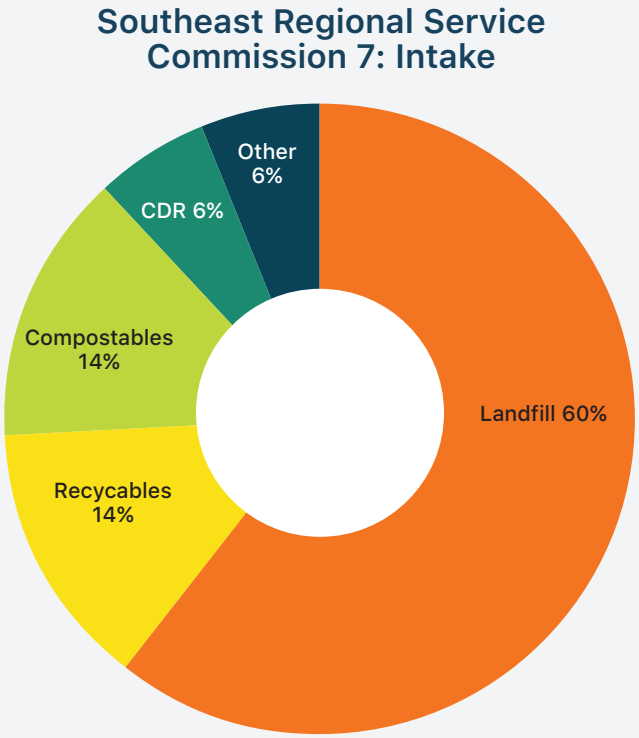
Public outreach and education

Kent RSC hosted eight hazardous waste and bulk item collection events in 2021. Kent RSC is also using a 3-Stream Residential Waste Program.

Recommendations

There appear to be no programs targeting commercial or industrial waste. This would contribute to Kent's strong start toward a circular economy.





Southeast Regional Service Commission 7

Regional details

Southeast RSC is the most densely populated region in New Brunswick, containing the same population (12,948) as RSC 11 in a much smaller area. Its residents are equally Anglophone and Francophone.

The waste diversion sector of the solid waste department has its own social media, campaigns, and website called Eco360. Southeast's website and social media channels communicate in both official languages.

One of New Brunswick's six landfills is housed in this region. Southeast partners with Kent RSC 6 and RSC 8 for all waste disposal. It also collects recycling from Chaleur RSC 3 and Greater Miramichi RSC 5.

Similar to Kent RSC 6 and 8, Southeast RSC 7 is structured to have a 3-Stream Waste Recovery system for all its residential waste collection. Just like the other regions, Southeast has compost collection every week with recycling and garbage pick-up on alternating weeks.

Due to all regions using the landfill and the Eco360 diversion facility, our research was unable to determine the exact weights for Southeast RSC 7, meaning we can't calculate Southeast's diversion and recycling rates to

better determine its success in transitioning to a circular economy. The pie chart above includes all the garbage, recyclables and compost this region's landfill accepted for all four regions it is partnered with in addition to itself.

Collection, collection, collection

Southeast's Mobile Eco-Depot runs every Tuesday and Wednesday, the largest number of collection events offered by any RSC.

In 2021, the number of vehicles that visited these events also increased by 39 per cent.

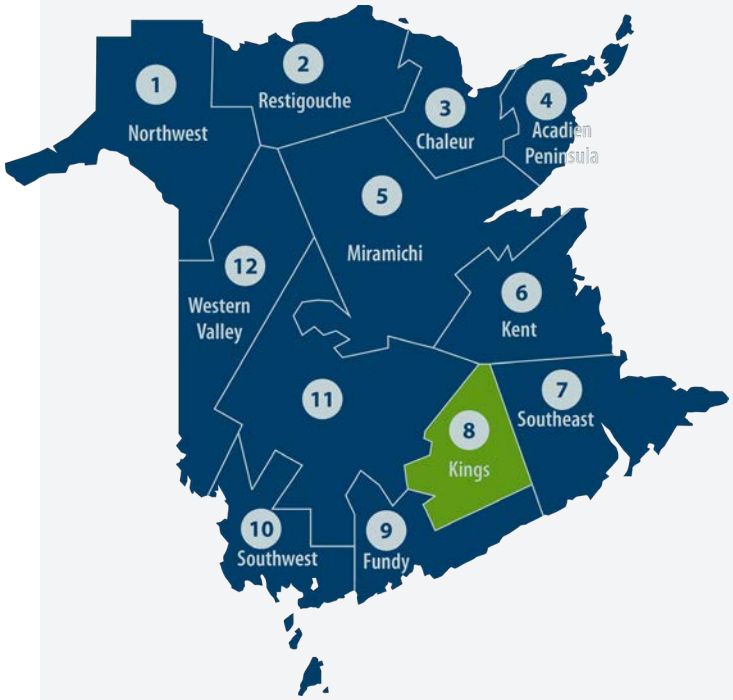
The region also hosts the popular Reuse Expo event twice a year at the Moncton Coliseum where community members can drop off reusable items to 15-20 non-profits/community partners—such as Habitat for Humanity, EnviroPlus, Hospice, the YWCA, and more—who use the items for their programs. Event coordinators estimate 90 per cent of what is brought to the expo finds a new home.

Southeast is the first region to collect non-beverage glass containers, beginning in 2021. Seventy-five metric tonnes were collected from the nine collection drop-off points in the first year.

Public education and outreach

With all these events going on, Southeast is still planning more, including a community-wide clean-up program, similar to that held in Chaleur RSC 3. The program aims to raise awareness about illegal dumping and initiate local clean-up efforts.

Eco360 is also active at schools and businesses giving waste reduction presentations and providing educational webinars online.



Regional Service Commission 8

Regional details

RSC 8 is housed in the agricultural hub of New Brunswick. According to the 2021 annual report, "Proportionately, the region has 3.5 times as many people employed in agriculture compared to Canada as a whole." This farm-heavy community is made up of 29,000 residents in a rural-suburb hybrid setting. Hampton is the only town within this region that has opted out of RSC 8 to participate in Fundy RSC 9.

Later in this report, we highlight a program RSC 8 is currently running to help local farms collect agricultural plastic. The **Kennebecasis Watershed Restoration Committee-led project** is one of the largest efforts we saw of an RSC working with and helping the commercial sector.

Similar to RSC 6 and 7, this region has a 3-Stream Residential Waste Program. Composting numbers were not included in the latest annual report so we can't determine its total diversion rate. It has a recycling rate of 32.3 per cent *(1,746 tonnes of Recyclables/ 5,412 tonnes of Residential Waste).*

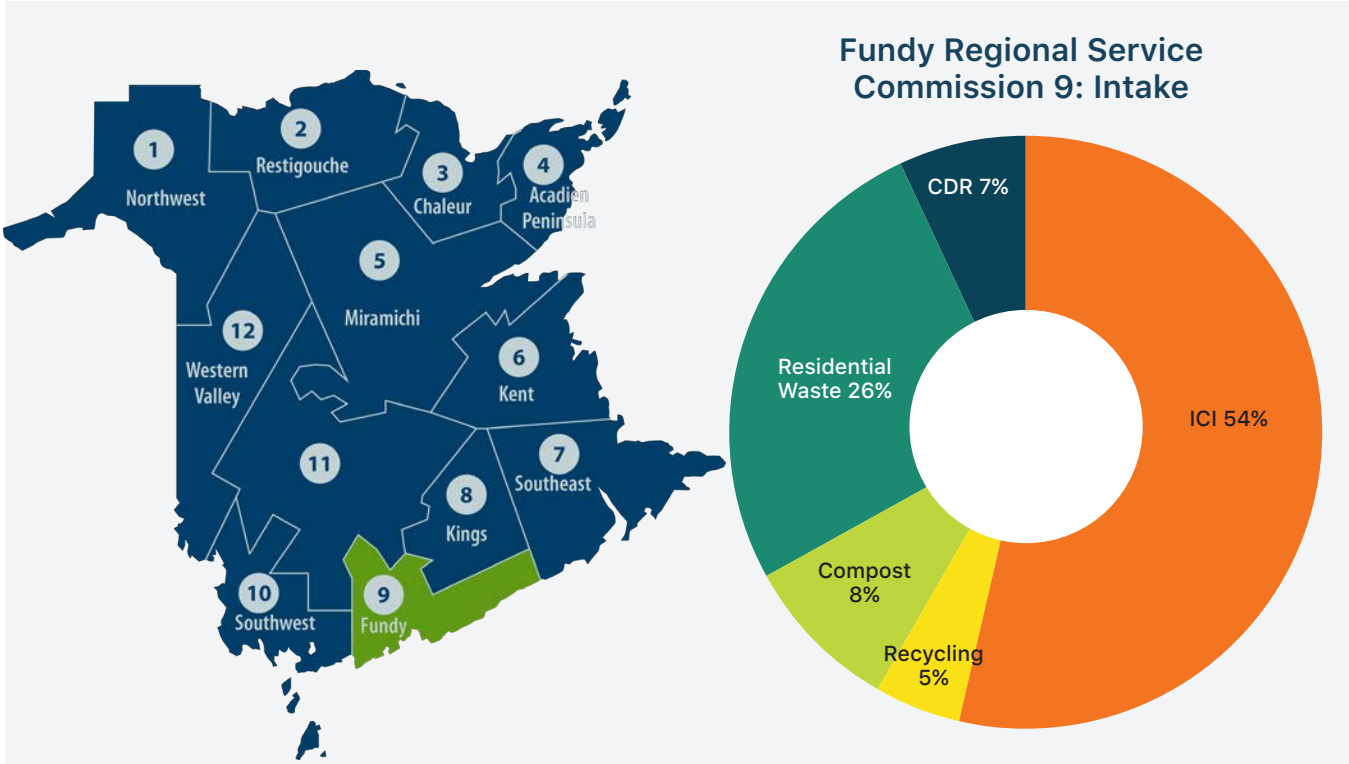
Public outreach and education

In 2021, one event was held for hazardous waste and bulk item collection. The region's social media, however, shows a considerable increase in event outreach and collection.

This region had the highest collection of household batteries. RSC 8 collected 3.54 tonnes of batteries in 2021, the latest available data, which was a 16 per cent increase from 2020.

Recommendations

We recommend increasing the number of public events hosted by RSC 8.



Fundy Regional Service Commission 9

Regional details

Fundy RSC 9 has a unique story. When a landfill was proposed for this reason in the early 90s, local residents were initially opposed. They eventually embraced the project with the promise that a strong public education component was baked into the operations (and operational budget) of the RSC. The landfill was established in 1997. One year later, Fundy's interpretive centre opened.

All RSCs offer school visits or office presentations on waste management, but this is the only region that has its own educational centre. Public education coordinator Janine Van Winssen says children listen and absorb the material better at the centre because it is a new place with interactive learning activities.

Fundy RSC 9 offers compost pick-up. Similar to Kent RSC 6, Fundy also uses the help of its waste collectors to inform residents when they've put contaminants into their recycling or compost. This is a very effective way to inform residents since it is right at the source of the problem and at the time of week when they are thinking about their waste.

This 'Oops' sticker is what the drivers use and is a very thick, adhesive sticker so drivers can quickly place it on the resident's bin.

This program, which includes sanitation workers placing 'oops stickers' on contaminated bins, is proving effective: Fundy's contamination rate is around 15 per cent, below the typical range of N.B. RSCs of 30 per cent.

A new pilot, the Waste Wise program, launched in Saint John in 2022. It charges residents for putting more than two garbage bags out for collection day. Additional bags must have a tag on them which can be purchased for $2 each.

The program led to Saint John's residential waste decreasing by 40 per cent in the first month. The amounts of recycling and compost, with compost doubling from 21 per cent to 42 per cent.

Public outreach and education

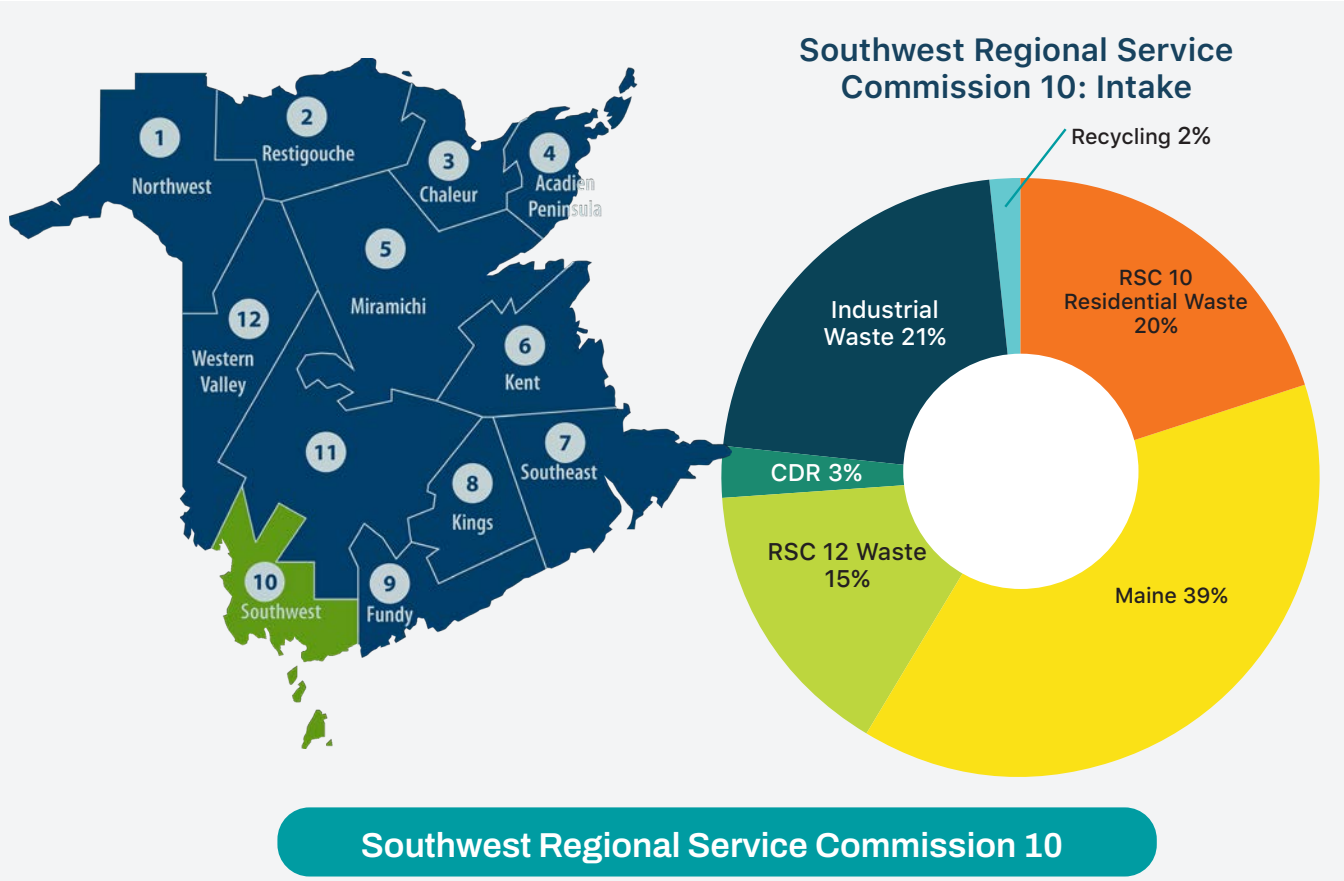
Thanks to public outreach funding at Fundy RSC 9, 80 per cent of all Grade 4 students in the region visit the interpretive center. Students in Grade 7 and 11 also visit the centre. Grade 4 students primarily stay inside the RSC office to watch videos and play educational games; Grade 7 students tour the landfill; and Grade 11 students tour the recycling sorting centre. Lesson plans and materials are designed for each grade level.

Educational materials align with school curriculum, contributing to their success and frequency. Grade 4 students need to learn about soil health, for example, while Grade 11 students come from the environmental studies class. Winssen said the RSC budgets extra money, around $5,000-$6,000, to pay for school bus transportation as most schools only budget one sanitation field trip a year.

Fundy also uses a 'Gold Box' program to encourage good waste diversion behaviour from residents. During the summer, interns perform door-to-door audits of resident's recycling bins. If the homeowners follow recycling guidelines, they receive a gold recycling bin to replace their blue one.

Recommendations

We recommend this region increase outreach to businesses to improve commercial and industrial waste diversion.



Regional details

Southwest RSC 10 is home to New Brunswick's fifth provincial landfill, the Hemlock Knoll site, providing waste management services for Maine's Washington County, half of Western Valley RSC 12 and Southwest itself.

The largest contributor to the landfill is Maine, despite the populations being similar—Washington County sits at 31,121 residents with the Southwest region being home to 28,724.

The Hemlock Knoll landfill is being slowly upgraded to include biogas collection.

Public outreach and education

Similar to the other RSCs, Southeast created an app to help inform the public during the COVID-109 pandemic.

Our scan showed the region's social media accounts did not contain much public education.

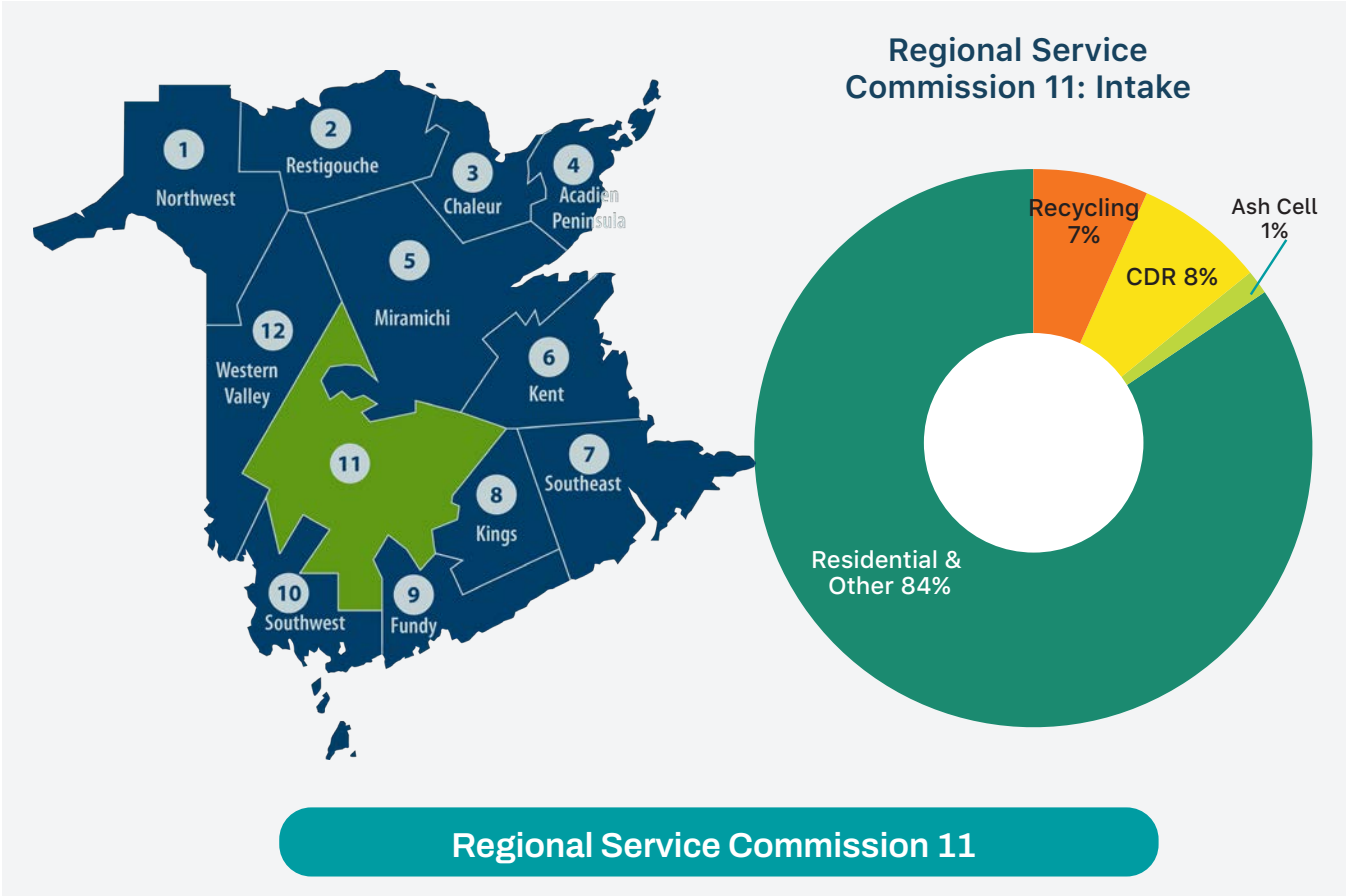
Recommendations

We recommend increasing public outreach and collection events. The Southeast website shows a program for white appliance pick-up, but hazardous waste items seem to have only one drop-off location at the landfill itself. This could cause higher garbage contamination and/or illegal dumping.

We also recommend developing a stronger partnership with Washington County, Maine. The population difference between Southeast RSC region and Washington County is less than eight per cent. When comparing the residential waste produced in Southeast to what is being collected in Maine, however, Maine is producing 48 per cent more.

Performing a waste audit in Maine to point out the primary producers of waste could lead to an effective waste reduction strategy that could prolong the life of the Hemlock Knoll Landfill.

Finally, we recommend providing all materials and platforms in both official languages to better accommodate all residents.



Regional details

RSC 11's landfill produces significantly more biogas than any other in the province.

In addition to the most power produced, this region is also tied with Southeast RSC 10 for having the highest population, meaning it must incorporate urban waste management strategies into its programs.

Landfill	Power in 2021	Homes
RSC 11	35,200 Mwh**	2,200
Southwest RSC 10	Flaring the biogas	none
Fundy RSC 9	1,375 Mwh	86*
Southeast RSC 7	7,289 Mwh	453
Chaleur RSC 3	6,000 Mwh	375**
Northeast RSC 1	1,869 MwH	117**

Note: To have a consistent table, we used Southeast RSC's number of 16 Mwh used per home because some reports gave only the power produced or the number of homes. *adjusted **calculated

Public outreach and education

Even though this region does not have a large Francophone population, it still communicates over its website and social media in English and French.

The region also has a helpful list of buyers of recycling products. There is also a recycling hotline for questions and tips.

The website also provides aerial tours of the landfill for those wondering where their trash goes.

RSC 11's social media accounts have been inactive since 2021.

The annual report didn't provide the residential waste collected, but it did provide the total waste collected from all sectors. With this, we were able to provide the total diversion rate of the region:

Recycling Diversion Rate of: **7.4%**

(6029 tonnes of Recyclables/ 81,530 tonnes of Total Waste from all Sectors)

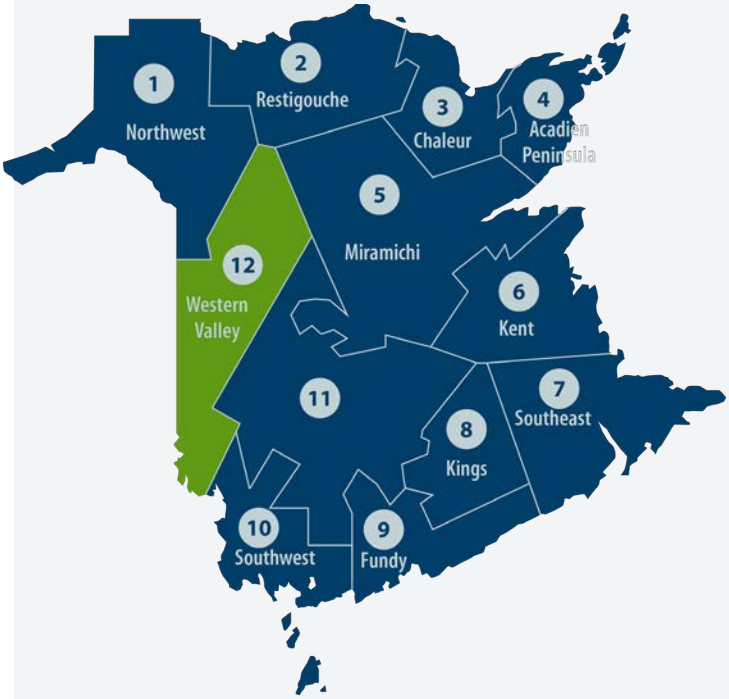
Recommendations

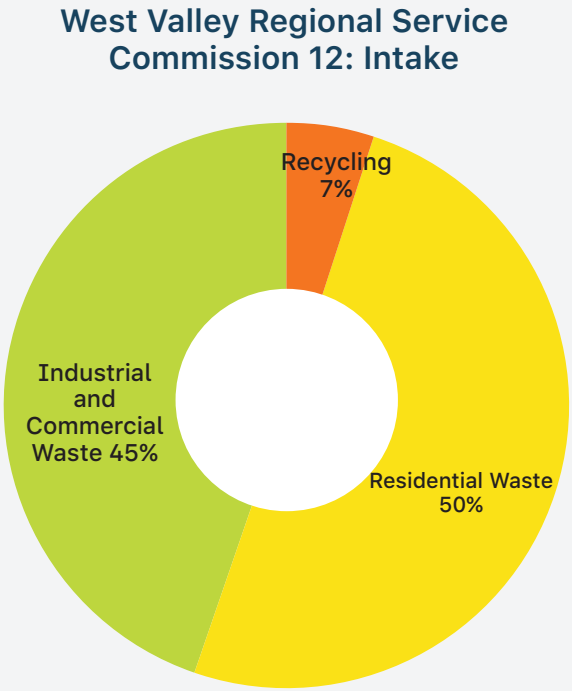
This region is one of the largest in area and population and may benefit from a city/rural hybrid waste strategy. Rural cities within this region, that are outside of the larger towns, could have a waste pick-up designed closer to that in Banff, Alberta. This way traveling costs are cut but communities can benefit from the drop-off locations rather than once-a-month pick-up.

For programs within the city, increasing awareness and decreasing contamination rate can be done using some of the programs practiced in Fundy RSC 9. The Gold Box Program and/or providing the recycle collectors "oops" stickers, for example.

We were unable to find an app for this region. We recommend either designing an app using the help of the other regions and/or continuing to post on social media to help keep the public informed.

In 2021, RSC 11 only hosted three collection events for hazardous waste and bulk pick-up. We recommend increasing to at least once-a-month events due to the large area and population of the region. EPR collection numbers from the Atlantic Used Oil Management Association showed that there is a significant difference in collection numbers Southeast RSC 7, who has the same population, compared to RSC 11. For plastic containers of used oil and glycol, there was triple the amount collected in Southeast RSC 7, who performs bi-weekly collection events, compared to RSC 11.





West Valley Regional Service Commission 12

Regional details

With just over 34,000 residents, West Valley RSC is largely rural. It sends half of its waste to Northwest RSC 1 and the other half to Southwest RSC 10.

Public outreach and education

With one of the highest number of followers on Facebook, RSC 12 not only posts about schedule changes and drop-off locations but also giveaway events to increase interactions on their posts and followers. The prizes seem to be practical, environmentally-friendly gifts like beeswax wraps and wool dryer balls.

They also have a Tip Tuesday where they post a variety of content including a simpler version of the waste hierarchy, food waste tips during holidays, and recycling tricks/knowledge.

The 2021 annual report contains a long list of achieved waste reduction goals showing the RSC is working hard to improve residents' baseline information and resources.

Other regions may benefit from trying the following as well:

- Campaigns to support Earth Day, Compost Week, Plastic-Free July, Waste Reduction Week, and Ralph the Recycling Elf Holiday Giveaways.
- Recycling books provided to Grade 2-3 students at local schools, composting units and supplies to Florenceville Elementary Schools and Knowlesville Arts & Nature Center.
- Zero Waste boxes distributed to local schools and daycares to recycle pens/pencils/markers and snack wrappers.

Recommendations

For the size of this region, we think that RSC 12 is doing an excellent job on public outreach. One recommendation is providing materials in both official languages.

There does not appear to be programs specifically addressing the industrial waste sector in RSC 12. Given that industrial waste accounts for almost half of the region's waste profile we recommend providing more support to businesses and industry.

06 Outside of New Brunswick

Introduction

In 2010, the Canadian Council of Ministers of Environment (CCME) published a report titled State of Waste Management in Canada which this report used as a benchmark to understand what the country, and individual provinces, had done up until that point. At the time, residential waste accounted for 37 per cent of the country's landfill use while non-residential waste accounted for 63 per cent. In 2019, the CCME produced another report on Construction, Renovation and Demolition Waste which reiterated that the non-residential sector not only produces a lot of waste but also makes up one of the largest solid waste streams in Canada, estimating as much as 40 per cent of the raw materials consumed in North America—wood, metals, minerals—are used in construction.

The key difference between the waste management plan of a linear economy compared to a circular one, is that a circular economy addresses the waste and pollution of the community as a whole. This includes businesses, construction, and other non-residential industries. As the CCME addressed, the waste created in these industries uses the largest portion of Canada's resources and should be given equal, if not more, attention in future waste management strategy planning.

As we look at what the other provinces are doing, the goal of this report is to gather information on how to improve waste management practices here in New Brunswick. A waste reduction strategy designed in Toronto may work in another large metropolis like Vancouver or Montreal, but it would not work as well in our rural, low-density province. Therefore, we have defined best practices in circular economy and waste reduction thinking as concepts and tools that can be used here in New Brunswick.

Best practices within Canada summarized

British Columbia offers a strategic perspective to design long-term goals as New Brunswick begins incorporating the new EPR for plastic, packaging, and paper.

Alberta's small town of Banff gives an excellent example of what a small town's circular economy can look like.

Nova Scotia's Divert NS litter program gives aspirations of what the new and upcoming programs here in New Brunswick at Chaleur RSC 3 and Southeast RSC 7 could become. These new programs also address illegal dumping and litter clean-up but are at the very beginning stages.

Yukon gives us an idea of how to encourage New Brunswick's mining industry to incorporate better waste management practices. In addition, we can use the winners of this program to provide businesses with tangible examples of sustainable business practices.

Newfoundland and Labrador has a similar low-density population as New Brunswick, so we looked there for ideas on enforcing waste management policies, such as giving more authority to the enforcement division within the department of fisheries.

We looked at Quebec Circulaire for insight into supply chain analyses to find points of waste and pollution in the mining industry. New Brunswick currently has little to no public research on commercial or industrial waste. This data is a key missing element if we want to create innovations to reduce waste and pollution.

Prince Edward Island is the first Atlantic province to have an EPR program for agriculture plastic. Cleanfarms in New Brunswick also collects the agricultural plastic containers, but P.E.I. is taking it one step further and applying this program to plastic silage which is a current problem in New Brunswick, as we discuss later.

Finally in Ontario, we found another material flow analysis report through the Circular Opportunities Innovation and Launchpad (COIL), but for the construction, demolition, and renovation industry. This could be achieved in New Brunswick, as well.

Metro Vancouver, British Columbia

We calculated a province's diversion rates to determine which jurisdiction is leading in practicing a circular economy. According to the latest available data (2018), the best provinces at diverting waste are: British Columbia (67 per cent), Quebec (47 per cent), and Ontario (35 per cent). By comparison, New Brunswick comes in at 33 per cent.

With B.C. leading the way, we contacted Metro Vancouver's Chris Underwood to better understand their journey toward a more circular economy. Here's what Underwood said when asked to describe British Columbia's timeline and milestones:

> *"[When the Extended Producer Responsibility for Packaging and Plastics regulation came into place], the industry had to set themselves up just as they did for batteries and tires and garbage containers. But this was really comprehensive because they had to get together with all the brand owners, importers, and all the manufacturers of all the various products which had packaging that ended up in the blue boxes. Including newspapers, right? It's a big undertaking. Recycling is mostly dealt with now by provincial product stewardship organizations. It started with bottles and cans, but now that extends to curbside collection of recycling from homes."*

According to B.C.'s Ministry of Environment and Climate Change Strategy, the EPR for plastic, packaging and paper was implemented between 2011-2014 and was a **turning point for waste management** in B.C.

The experience shows that with the right strategy and outreach/participation from residents,

commerce and industry, EPRs can lead to transformation change within New Brunswick waste management system, too.

Banff, Alberta

When asked about leaders in Alberta, Christina Seidel, the Executive Director of Recycling Council of Alberta, directed us to the 2020 Circular Cities Roadmap and its two brightest stars, Lethbridge and Banff.

We investigated the town of Banff because of its low population and tourism economy, similar to N.B. towns like St. Andrews and St. Martins.

Banff has an in-depth waste management plan and extensive public outreach for a town of 8,000 people.

One thing that sets Banff's waste stream management apart is that it gives equal attention to both residential and non-residential streams. The town has a waste diversion rate of 46 per cent, not including CDR. Banff's waste stream profiles for residential and non-residential waste include four areas of focus to improve diversion rates: Education & Communication, Improve Convenience, Financial Incentives, and Material Ban. Similar waste profiles and strategies could greatly benefit New Brunswick's small communities.

Banff does not provide residential door-to-door waste pick-up. Instead, they have Zero-Waste Drop-Off Centers all across the town that have four large bins for food waste, landfill waste, recyclables, and glass containers. With seasonal residents coming and going, this most likely is a more cost-effective way for local waste management.

Banff's waste management system might help towns like St. Martins. A St. Martins business owner interviewed for our report told us that a lack of waste management support during the tourist town's off-season months was a challenge. During the off season, garbage is picked-up every other week and there is a maximum quantity set as well. The nearest landfill for Fundy RSC 9 is more than an hour away from their business so bringing additional large waste to the landfill isn't very cost effective.

Considering the transportation costs Fundy RSC 9 is paying, reducing pick-up frequency makes sense, but Banff's model could save the RSC more while also improving access to services for year-round residents.

Other Banff programs we think small communities in New Brunswick could benefit from include:

- The Trailblazer program for businesses;
- The Library of Things for borrowing equipment; and,
- The Re-Use It Centre at the in-town transfer station.

Ontario; COIL- Circular Opportunities Innovation Launchpad

One good example of communities moving toward circular economy practices in the construction, demolition and renovation (CDR) sector is the Circular Opportunities Innovation Launchpad, or COIL.

A project of the City of Guelph, COIL conducted a material flow analysis report for the region's CDR industry, looking at obstacles and

opportunities for more circular practices. Despite a lack of public data from the CDR sector, something consistent with New Brunswick, COIL made recommendations to improve recycling and reduce rates, including:

- Changing the 'lowest bidder' construction culture which usually leads to more materials and costs in the long-term
- Update the deconstruction laws to make demolition/renovation projects an easier choice since the MFA found they are effective and environmentally friendlier than new construction.

A material flow analysis for New Brunswick's CDR sector would provide valuable insight for industry, policy-makers and RSCs in building a more closed-loop system between our construction and forestry industries.

Quebec Circulaire

In researching this report, we encountered a great deal of data on residential waste but almost no data on commercial or industrial waste. When reviewing the 2021 annual reports from all 12 RSCs in New Brunswick, there were primarily two or three categories: commercial waste, industrial waste, and construction/demolition waste. The quantities were listed but the details of where this waste is coming from or what it is composed of was not.

We need more data if we are going to address the problem of waste from every point of its production. We need data outside of the end-of-use stage, once it leaves the resident's home.

A study done by Institut EDDEC in Quebec in 2018 performed a comprehensive evaluation of the metal industry in Quebec, specifically iron,

lithium, and copper. This report looked at the production of these metals and recorded the loss at each step. It found:

- there was a 14 per cent loss at the melting/transformation stage;
- a 6 per cent loss at the fabrication/assembly stage; and,
- 93 per cent of the iron was collected for recycling at the end-use stage.

After the analysis, the paper listed 13 possible strategies that could fix these points of waste that could work for the mining industry in Quebec.

The Quebec Circulaire research provides an excellent example of the type of studies needed in New Brunswick to advance commercial and industrial connections in a circular economy.

Nova Scotia; DivertNS

Divert NS is an organization that acts like a combination of N.B.'s Recycle NB and the Environmental Trust Fund (ETF). It not only provides research and development funding generated from the province's Beverage Containers Program like the ETF, but they also maintain the tire stewardship program similar to RecycleNB.

Divert NS runs two programs that, if adopted in New Brunswick, would help close the gap in public education around waste reduction: its litter clean-up program, and its library of reuse, repair, reduce shops. Both programs are effective at raising awareness on waste reduction and circular economy practices while also working effectively with small, rural communities.

Divert NS performs provincial litter audits and produces materials to show the changes in the litter profiles over time and best practices for reducing and reusing waste.

Divert NS also helps organize community wide clean-ups. It provides the supplies for volunteer-powered litter clean-ups and they highlight the community's effort on an online map.

Chaleur RSC 3 started a similar program in 2021 and Southeast RSC 7 plans to start one in summer 2023. Divert NS provides an excellent model for community clean-ups that could be used to expand New Brunswick's existing projects and expand into all RSCs.

Divert NS's reuse, reduce, repair shop library, meanwhile, lists more than 50 shops in Nova Scotia where you can rent tools, musical instruments, sporting equipment, and more. There's also lists of workshops to learn new skills like repair and sewing classes. Similar programs at New Brunswick RSCs could improve material efficiency and reduce waste in communities.

Multi-Materials Stewardship Board, Newfoundland and Labrador

Illegal dumping is a significant concern for solid waste management teams across the country, and it's no different in New Brunswick or Newfoundland.

'Disposal' is the last step—the area to be reduced the most—when developing a circular economy, and creating additional policies like landfill bans could run the risk of increasing the rate of illegal dumping if it is still a provincial issue.

To figure out how to close the gap on New Brunswick's illegal dumping issue we investigated how Newfoundland and Labrador has been addressing the problem. There, the provincial government named the Multi-Materials Stewardship Board as the lead provincial authority in its 2019 strategy for solid waste management.

In 2021, the resource enforcement division within NFLD's department of fisheries, forestry and agriculture was given new authority to help enforce illegal dumping laws, adding more than 90 officers to the enforcement team.

The Multi-Materials Stewardship Board also funds local clean-up initiatives. Its project Come Home 2022 helped fund 261 projects to the tune of nearly $500,0000.

We were not able to find much research into illegal dumping in New Brunswick. RSC 8 is making efforts to help curb agriculture-related illegal dumping, and multiple RSCs have expressed motivation for hosting bulk item/hazardous waste collection events to help prevent illegal dumping. We recommend a similar approach to Newfoundland and Labrador: invest money to better understand the problem, then invest money into prevention (awareness) and enforcement.

Robert E. Leckie Award, Yukon

In this section we briefly highlight an effort being made in Yukon to improve the mining industry.

The Yukon's Robert E. Leckie Award highlights mining companies trying to incorporate a more circular economy strategy. The winner of the 2022 award was nominated for their reclamation work. The company continuously repairs the land by landscaping and rounding the hills with topsoil once an area has been mined.

In a circular economy, participation and 'buy-in' from businesses and industries is key. Awards such as Yukon's Robert E. Leckie Award can be useful tools for encouraging participation in and rewarding companies for integrating circular economy practices into their operations. Yukon's award winners can also be used as a resource for ideas on improving circular economy mining practices in New Brunswick.

Cleanfarms, P.E.I.

In December 2022 Prince Edward Island became the first province in Atlantic Canada to introduce an EPR program for agricultural plastics. Cleanfarms, a non-profit environmental stewardship organization, helps regulate the program.

Cleanfarms provides resources to help families participate in and comply with the agricultural plastics EPR. The EPR covers products such as containers for pesticides, medicines, totes and silage plastic wrap, a particular problem in N.B. we'll discuss later.

The non-profit Prince Edward Island Federation of Agriculture also provides tools, funding and management assistance for farmers to practice more environmentally-friendly strategies like composting, soil health, and drought tolerance.

As P.E.I. grows its silage plastic program, there are opportunities for New Brunswick to adopt best practices to address its agricultural plastics problem.

07 Looking at New Brunswick's businesses

The commercial and industrial sectors are the driving force of a circular economy. Yet, we could find little information about transitioning New Brunswick's commerce and industry sectors to integrated closed-loop systems. While this highlights a need for strong policy direction from the government, it doesn't mean there is nothing happening in these spaces in New Brunswick. Below, we highlight one circular economy challenge and one success in New Brunswick.

Agricultural plastic

Statistics Canada reported that in New Brunswick in 2022, the agriculture industry, combined with forestry, fishing, and hunting, had the largest economic growth than any other sector by 10.7 per cent. This growth rate prompted us to look at possible circular economy opportunities in this industry.

John Russell from the Agricultural Alliance of NB told us that most farms in New Brunswick receive little to no waste management services because although they're largely based in rural, residential areas they are designated as commercial waste. He said that most farmers compost and the containers they use for things like chemicals and pesticides are collected. There is one large item, however, they can't find a place for: silage plastic. Variations of this plastic are what farmers use to wrap greenhouses, hay bales, and cover rows to prevent weeds.

Dave Wolpin, a Hampton business owner who sells agricultural products, spoke on the difficulty of the choice for a farm owner:

> *"I've transitioned into agricultural sales, and so now I am now responsible for millions of square-feet of plastic every year that I sell to farmers. What do we do with that? Many people want to buy local and most people want to buy local, grown without chemicals. And so, if you're going to do that, you need plastic. We live in a northern climate. We need row covers. We need greenhouses. If you're not going to use herbicides for weeds, then you need row cover. A lot of people talk about all these magical ways of managing your soil perfectly, but unfortunately, when you scale it, it just doesn't work. You always need plastic."*

When asked about the biodegradable substitute, Bio360, made in Quebec for grown cover, Wolpin offered another point to consider:

> *"I have a lot of customers that use Bio360. Yes, it works, but the other thing is, the ground cover which is the worst kind of plastic that I sell, it's good for 10 years. Bio360 is good for one year. It's made with plant oils, which requires carbon-based farming to grow. Some of it is being produced with GMO corn, soy, et cetera. So, the question is, what is the right answer? Even if they're using it (the plastic ground cover) for six years, what is the fuel impact for transporting those rolls? For (Bio360) transporting them six times (over that same period of time) rather than just once?"*

Dealing with agricultural plastic is difficult for multiple reasons. One is that it is usually contaminated with organic residues so RSCs can't simply recycle it. Russell, with the Agricultural Alliance, noted that farmers receive residential waste collection services that do not cover commercial waste such as the silage plastics. Some farmers feel they should receive commercial waste services since they are taxed as farmers, not just residents.

Without support, Russell said many farmers either form a small landfill on their property or burn the plastic.

Currently there are small efforts to turn this plastic into a new product. Wolpin mentions a start-up, Plaex, which makes construction bricks out of plastic. Concerns have been raised that microplastics will shed as the bricks erode. Plaex has yet to scale its production to support large collections.

Some Assistance

Some RSCs in N.B. provide assistance to farmers. RSC 8 is responsible for the Sussex area, the heart of farming in New Brunswick. This RSC not only collects the plastic for free once a farmer is registered, but also has an additional collection program run by the **Kennebecasis Watershed Restoration Committee**.

Recommendation

P.E.I., along with other provinces like Quebec and Manitoba, have used the help of Cleanfarms to support farmers and their plastic silage waste. New Brunswick should expand Cleanfarms' work with our agricultural sector as well.

Fundy North Fishermen's Association

We can't give this non-profit enough appreciation. The Fundy North Fishermen's Association has run a ghost gear program since 2005 that has become its own circular economy feedback loop.

Fundy North's ghost gear program tracks lost fishing gear which lobster fishers lose during storms or because their buoy lines are cut by other traveling ships. Retrieving this gear not only helps prevent whale entanglements but it helps prevent new traps from getting caught in the large 'tumble weeds' of gear that form underwater.

The people who make the program work out on the water are longtime fishers themselves. They use their knowledge of the local waters and tides to make dozens of trips collecting 'snarls'—the fisher's term for lost gear.

Reid Brown, a long time Fundy Bay fisher, engineered the grapple used to retrieve lost cages from 400-500 feet on the rocky ocean floor. The largest snarl caught was up to 30 traps. Rope tumbleweeds can sometimes weigh as much as 800 pounds.

The ghost gear program also helps prevent future loss of gear. As the tides push the underwater snarls of traps, new gear is caught in the entanglement, compounding the problem. After nearly decades of the program, fishers say they are no longer seeing large snarls of 30-plus cages like they did in the early years.

Removing the gear from the ocean is beneficial for the wildlife and fisheries, but Fundy North makes sure the collected gear is responsibly disposed of as well. The lobster traps that are recovered have a few points of reuse, in true circular economy fashion:

- If they are still working, then they are returned to the owner;
- If they still hold their form but are no longer functional as traps, they are used has cages to build retaining walls for landscaping; and,
- If the traps are so rusted that they can no longer be used, they are sent to a metal recycling facility.

The rope retrieved through the program currently doesn't have as straight forward an approach for reuse/recycling because plastic cannot be as easily reused as metal. There are some repurposing programs at the Huntsman Marine Science Centre, which provides rope mat weaving classes. Fundy North also sends some of the rope to a plastic recycling company in Montreal.

08 Conclusion

The goal of a circular economy is to have an ecosystem-like interconnectivity between all production and consumption points within our economy. Just as in nature, the waste of one is the resource of another.

Currently in our linear economy, this connectivity is primarily focused within the residential sector, in that our recyclables and compost are made into more household products. A circular economy uses a number of tools and policies, such as EPRs, landfill bans, and social incentives, to increase connectivity among residential, commercial and industrial production, consumption and disposal.

New Brunswick needs more research into points of pollution to begin developing a robust network of circular economy participants. Examples from Quebec and Ontario show how helpful tools like material flow analyses can be for improving an industry's waste management.

Innovative solutions are everywhere in a circular economy: lost gear from the lobster fishery can be cleaned-up from the ocean floor and reused by landscapers.

A simple litter clean-up program can grow into a huge provincial educational platform after a decade of persistence.

A small town of only 8,000 residents can have some of the best diversion rates in Canada because their community leaned into the strengths of its small, rural setting. Half of New Brunswick lives in a rural setting. This can either be an expensive obstacle for waste management or an asset for building a productive and efficient circular economy.

For higher-density populations, Southeast RSC 7 has the highest participation in public events and waste reduction programs by providing more than 50 waste collection opportunities a year for its residents. Combine this with Fundy RSC 9's funding model for school outreach and you would have the perfect New Brunswick-made urban waste management strategy.

New Brunswick's upcoming EPR for paper, plastic, and packaging will help build the collection infrastructure, but we have to ensure limited contamination in collected materials, and consistent buyers for the reusable product.

Let 2023 be New Brunswick's turning point. We have the tools in our communities, we just need to organize, collaborate, and set realistic goals and timelines to chart the course for an integrated, efficient, productive and sustainable circular economy across New Brunswick.

09 Resources

Acadian Peninsula Regional Service Commission (2021) *Annual Report.* Retrieved from: CSRPA-RapportAnnuel-2021.pdf

Amin, S., Strik D., Leeuwen J. V. (2022) *A multi-method approach to circular strategy design: Assessing extended producer responsibility scenarios through material flow analysis of PET plastic in Jakarta, Indonesia.* Retrieved from: A multi-method approach to circular strategy design: Assessing extended producer responsibility scenarios through material flow analysis of PET plastic in Jakarta, Indonesia - ScienceDirect

Auditor General New Brunswick (2012) Chapter 4 V2 Solid Waste Commissions. Retrieved from: New Brunswick Art Bank (agnb-vgnb.ca)

Canadian Council of Ministers of the Environment (2014) Roadmap to Strengthen the Management of Single-Use and Disposable Plastics. Retrieved from: https://ccme.ca/en/res/state_waste_mgmt_in_canada-secured.pdf

Canadian Council of Ministers of the Environment (2019) *Guide For Identifying, Evaluating and Selecting Policies for Influencing Construction, Renovation and Demolition Waste*. Retrieved from : Guide for Identifying, Evaluating and Selecting Policies for Influencing Construction, Renovation and Demolition Waste Management (ccme.ca)

Canadian Council of Ministers of the Environment. Prepared by Girous Environmental Consulting (2014) *State of Waste Management.* Retrieved from: https://ccme.ca/en/res/sudproadmapen.pdf

Chaleur Regional Commission (2021) Annual Report. Retrieved from: 2021AnnualReport_Approved2022-10-31.pdf (csrchaleurrsc.ca)

Circular Materials (2022) Consultation: New Brunswick Stewardship Plan for Packaging and Paper. Retrieved from: Consultation: New Brunswick Stewardship Plan for Packaging and Paper | Circular Materials

Fredericton City (2022) Fredericton Community Energy and Emissions Plan. Retrieved from: cof_ceep_en.pdf (fredericton.ca)

Fundy Regional Service Commission (2021) Annual Report. Retrieved from: 2021-FRSC-Annual-Report-sm.pdf (fundyrecycles.com)

Government of Newfoundland and Labrador (2019) Solid Waste Management in NewFoundland and Labrador. Retrieved from: waste-management-final-report-review-pswms.pdf (gov.nl.ca)

Greater Miramichi Regional Service Commission (2021) Annual Report. Retrieved from: Annual Reports and Workplan — The Greater Miramichi Regional Service Commission (greatermiramichirsc.ca)

Kent Regional Service Commission (2021) *Annual Report.*

Ministry of Environment and Climate Change Strategy- British Columbia (n.d) Advancing Recycling in B.C.- Extended Producer Responsibility Five-Year Action Plan 2021-2026. Retrieved From: Advancing Recycling in B.C. - Extended Producer Responsibility Five-Year Action Plan 2021-2026 (gov.bc.ca)

Mulit-Material Stewardship Board (2022) 2021-2022 Annual Report. Retrieved from: Multi-Materials-Stewardship-Board-MMSB-Annual-Report-2021-22-online.pdf

Northwest Regional Service Commission (2021) Annual Report Retrieved from: Rapport annuel 2021 copy (csrno.ca)

Pires, A. and Martinho, G. (2019) Waste Hierarchy Index for Circular Economy in Waste Management. Retrieved from: Waste hierarchy index for circular economy in waste management - ScienceDirect

Québec Circulaire (2018) Métaux et Économie Circulaire Au Québec. Retrieved from: Métaux et économie circulaire au Québec (quebeccirculaire.org)

Recycle NB (2021) *Moving Beyond Waste; 2021 Annual Report*. Retrieved from: rnb_ar_2021_en_final_lr.pdf (recyclenb.com)

Regional Service Commission 11 (2021) *Annual Report*. Retrieved from: http://www.rsc11.ca/wp-content/uploads/2022/05/RSC11-Annual-Report-2021.pdf

Regional Service Commission 12 (2021) Annual Report. Retrieved from: https://www.rsc12.ca/wp-content/uploads/2022/04/Annual-Report-2021.pdf

Regional Service Commission 8 (2021) Annual Report. Retrieved from: https://www.rsc8.ca/_files/ugd/18bb24_9049cdec33d04c88a268e6e7aff414fc.pdf

Restigouche Regional Service Commission (2021) Annual Report. Retrieved from: ANNUAL REPORTS - RAPPORTS ANNUELS - Google Drive

Ruokamo E, Savolainen H., Seppala J., Sironen S., Raisanen M., Auvinen A. (2023) Exploring the potential of Circular Economy to Mitigate Pressures on Biodiversity. Retrieved from: Exploring the potential of circular economy to mitigate pressures on biodiversity - ScienceDirect

Southeast Regional Service Commission (2021) Annual Report. Retrieved from: AR20-Final-E-2021-05-12.pdf (nbse.ca)

Southwest Regional Service Commission (2021) Annual Report. Retrieved from: 2021-SNBSC-Annual-Report.pdf

Yamaguchi, Mitsutsune (2018) Extended Producer Responsibility In Japan- Introduction of “EPR” into Japanese waste policy and some controversy. Retrieved from: Microsoft Word - EPR in Japan final.doc (m-yamaguchi.jp)

10 Appendix

Appendix A: In-person or over the phone interviews

Name	Title	Location	Topic
Charlene	Manager of BayBaie BnB & Bistro	Saint Martins. NB	Business struggles with Waste
Matt Abbott	Fundy Baykeeper- Conservation Council of New Brunswick	Saint Andrews, NB	Residential Waste and Fisheries Industrial Waste
Chris Underwood	Division Manager, Solid Waste Planning- Metro Vancouver	Vancouver, B.C.	Circular Economy and Infrastructure
Brenda MacCallum	Fundy RSC 9- Public Relations & Program Development Officer	Grand Bay-Westfield, NB	Public Education
Christina Seidel	Executive Director of Recycling Council of Alberta	Bluffton, AB	Beginning stages of Circular Economy
Richard Lebel	Director of Ecological Management Services of Residual Materials- Northwest RSC 1	Edmundston, NB	Construction Waste and Public Education
Darlene Norman-Brown	Assistant Director of Fundy North Fishermen's Association	Saint Andrews, NB	Industrial Waste and Project History
John Russell	Environmental Farm Plan Program	Moncton, NB	Agricultural Industrial Waste
David Wolpin	Agricultural Product Salesman	Hampton, NB	Plastic Agriculture Waste
Janine Van Winssen	Public Education Coordinator- Fundy RSC 9	Grand Bay-Westfield, NB	Public Education and Industrial Waste
Gena Alderson	Waste Diversion Coordinator RSC 7- Eco360	Berry Mills, NB	Waste Reductions and Programs
Luc Gagnon	Operations program Manager at Atlantic Used Oil Management Association		New Brunswick's Used Oil and Glycol EPR

Appendix B: Breakdown of the Numbers

Region and Notes	Residential Waste	Industrial/Comm/ CDR	Recycling
CRSC 1 The report mentions 3 other CDR drop off sites. The total only accounts for the CDR that is at the landfill	From RSC 1 only	(29,693 t reclaimed material) + (896 t CDR) + (33 t special treated materials)	As Written
RSC 2	As Written	(ICI 4661 tonnes + 1844 CDR) + (561 clean CDR)	As Written
RSC 3	From RSC 3 only	(CDR 9,817) + (Sludge 1353)	As Written
RSC 4	As Written	(ICI 10,949) + (construction 3352)	As Written
RSC 5	57% of 21994= 12536	(40 % of 21994) + (2% of 21994)= 9238	As Written
RSC 6	The "total residential waste" in Table 10.3- Kent Solid Wase Report 2021 includes recycling and organics. We used 4737.25 from Table 10.2 for the residential waste amount	As stated in total 10.3	As Written
RSC 7	The combined weight of Westmorland and Albert counties	Not stated	The recycling amount listed is that collected from RSC 3, 5, 6 7, and 8
RSC 8	As written	(CDR of 5741) + (ICI of 45401)	As Written
RSC 9	As written	(CDR of 5741) + (ICI of 45401)	As Written
RSC 10	From financials given		As Written
RSC 11	Not Stated	(CDR of 6522) + (ash cell of 1264)	As Written
RSC 12	(19166 x 49%) + (19166 x 4%) from "Breakdown by Source" graph	(19166 x 47%)	As Written