

# Education on Water Conservation and Stormwater Management in the Shediac Bay Watershed

## Final Report



*By:*

**The Shediac Bay Watershed Association Inc.**

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# Acknowledgements

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## TABLE OF CONTENTS

1	Introduction .....	1
1.1	Description of the Shediac Bay Watershed Association .....	1
1.2	Overview of the Shediac Bay Watershed .....	2
2	Water Conservation and Stormwater Management .....	3
2.1	Shediac Municipal Centre of Operations - Naturalized Stormwater Retention Basin	4
2.2	Rain Garden – Vestiaire St. Joseph .....	6
2.3	Rain Garden at Shediac Cape School .....	7
2.4	Residential Rain Garden Program ( <i>NEW!</i> ).....	8
2.4.1	Residential Rain Garden #1 .....	8
2.4.2	Residential Rain Garden #2.....	10
2.4.3	Residential Rain Garden #3.....	12
2.5	Future Project Planning – Shediac Rotary Park & Homarus Bioswales .....	13
2.6	Rain Barrel Giveaway .....	14
2.6.1	Rain Barrel Survey .....	15
3	Education Materials.....	18
3.1	Rain Garden Guide for Homeowners .....	18
3.2	Rain Garden Brochure .....	20
3.3	Residential Rain Garden Sign.....	20
3.4	Rain Garden Video .....	20
3.5	Rain Barrel Sticker .....	21
3.6	Rain Garden Course - NB Natural Infrastructure Community of Practice.....	21
3.7	The Shediac <i>Good Times Guide</i> – Rain Garden Advertisement .....	21
3.8	Educational Videos for Youtube and Social Media .....	22
4	General Presentations .....	23
4.1	Bioswale Presentation to Department of Environment and Local Government	23
4.2	Virtual Workshop - Green Infrastructure .....	23
5	School Programs, Field Trips and Presentations.....	24
5.1	Presentation Series Polyvalent Louis-J.-Robichaud - Biodiversity & Habitat Restoration	24
5.2	Canadian Wildlife Federation’s <i>WILD Outside!</i> Program .....	25
6	Communications and Outreach .....	26



6.1	Newsletter.....	26
6.2	Socials Medias and Website.....	26
6.3	Education Program Summary.....	27
7	Conclusion.....	28
	Annex 1 – Summer 2020 Newsletter (English).....	29
	Annex 2 – Summer 2020 Newsletter (French).....	30
	Annex 3 - Fall 2020 Newsletter (English).....	31
	Annex 4 - Fall 2020 Newsletter (French).....	32
	Annex 5 - Winter 2021 Newsletter (English).....	33
	Annex 6 - Winter 2021 Newsletter (French).....	34
	Appendix A – ETF Program Priority Areas Mesurables.....	<b>Error! Bookmark not defined.</b>
	Appendix B - Educational Materials Collection.....	36

## TABLE OF FIGURES

Figure 1: Map of Shediac Bay watershed boundaries.....	2
Figure 2: A Bioretention System in the Shediac Bay Watershed.....	3
Figure 3: Shediac Municipal Centre of Operation Naturalized Stormwater Retention Basin – Before (05/2019) and After (08/2020).....	4
Figure 4: Hardy cattail growth (August 2020).....	4
Figure 5: Bioretention System – Water Inlet.....	5
Figure 6: Bioretention System Inlet and Outlet - Rain Event Sampling (September 22, 2020).....	5
Figure 7: <i>Vestiaire St. Joseph</i> Rain Garden, Spring 2020.....	6
Figure 8: Addition of Swamp Milkweed and Sensitive Ferns (June 2020).....	6
Figure 9: <i>Vestiaire St.-Joseph</i> Rain Garden in Bloom (August 2020).....	6
Figure 10: Shediac Cape School Rain Garden, October 2020.....	7
Figure 11: Shediac Cape School Rain Garden Plants (October 2020).....	7
Figure 12: Residential Bioswale #1 – Construction Photos Part 1 (August 2020).....	8
Figure 13: Residential Bioswale #1 – Construction Photos Part 2 (August 2020).....	9
Figure 14: Rain Garden Sign Installation and Bioswale Photo in the Fall (October 2020).....	9
Figure 15: Residential Rain Garden #2 – Construction Photos (September 2020).....	10
Figure 16: Residential Rain Garden #2 – Completed (September 2020).....	11
Figure 17: Residential Rain Garden #2 – Sign Installation (October 2020).....	11
Figure 18: Residential Rain Garden #3 – Construction Photos (September 2020).....	12
Figure 19: Parking Lot Bioswales - Construction Designs.....	13
Figure 20: Rain barrel setup in Shediac.....	14
Figure 21: Facebook Rain Barrel Contest Post 2020.....	14
Figure 22: Rain Garden Illustration Containing Plants Native to NB.....	18
Figure 23: Rain Garden Guide for Homeowners.....	19
Figure 24: Rain Garden Guide for Homeowners.....	19
Figure 25: Residential Rain Garden Sign for Homeowners.....	20
Figure 26: Rain Garden Video for Facebook.....	20

Figure 27: Rain Garden Video for Youtube .....	20
Figure 28: Rain Barrel Sticker .....	21
Figure 29:Shediac Good Times Guide Advertisement on Rain Gardens, Fall 2020 .....	21
Figure 30: New Videos Uploaded to Youtube.....	22
Figure 31: Virtual Workshop Screenshot (December 3, 2020) .....	23
Figure 32: SBWA Project Coordinator Jolyne Hebert .....	24
Figure 33: Hand Washing Station.....	25
Figure 34: CWF Webinar Screenshot (November 3, 2020) .....	25
Figure 35: Water Conservation & Stormwater Management pamphlet .....	36
Figure 36: Infographics and posters.....	36
Figure 37: Fact Sheets on Stormwater Runoff and Water Quality .....	37
Figure 38: Rain Barrel Pamphlet .....	37
Figure 39: Interpretation panels developed in 2017 .....	38
Figure 40: Interpretation panel collection developed in 2015 .....	38

# 1 Introduction

## 1.1 Description of the Shediac Bay Watershed Association

The Shediac Bay Watershed Association (SBWA) was founded in 1999 as a result of growing concerns from local community residents over the ecological health of Shediac Bay. In order to establish a long-term water quality-monitoring program, a community-based association was formed.

The Shediac Bay Watershed Association gratefully receives guidance, donations and in-kind support from various organizations and interest groups consisting of business owners, industry, foresters, farmers, residents, cottage owners, recreation boaters and swimmers, conservation groups and community organizations within the Shediac Bay Watershed.

Public education has always been an integrated part of all the Shediac Bay Watershed Association's initiatives. Every year, the Association organizes activities meant to engage the public in environmentally friendly practices such as litter cleanup and tree planting, hoping to raise awareness and to build good habits. Our strong presence in the public eye is a major factor to the success of many of our initiatives, and to keep the public informed of the great work being accomplished by the Association.

Due to the COVID-19 pandemic, several education and outreach activities were either modified or canceled in the 20-2021 fiscal year. The following report presents on the activities accomplished.



## 1.2 Overview of the Shediac Bay Watershed

The Shediac Bay Watershed covers 420 km<sup>2</sup> of land area and stretches along 36 km of coastline, from Cap Bimet to Cap de Cocagne (Fig. 1). The Shediac Bay Watershed is composed of two major river systems emptying into Shediac Bay: the Shediac River and the Scoudouc River. The Shediac and the Scoudouc Rivers are characterized by small tributaries covering a watershed of 201.8 and 143.3 km<sup>2</sup>, respectively. The Shediac River is composed of two major water arms. The northern water arm is created by the convergence of the McQuade Brook, the Weisner and the Calhoun Brook. The southern water arm of the Shediac River is the continuation of the Batemans Brook. Water velocity in both rivers is generally weak due to the gentle regional elevation. The watershed boundaries stretch into both Kent and Westmorland County and cross into both Shediac and Moncton.

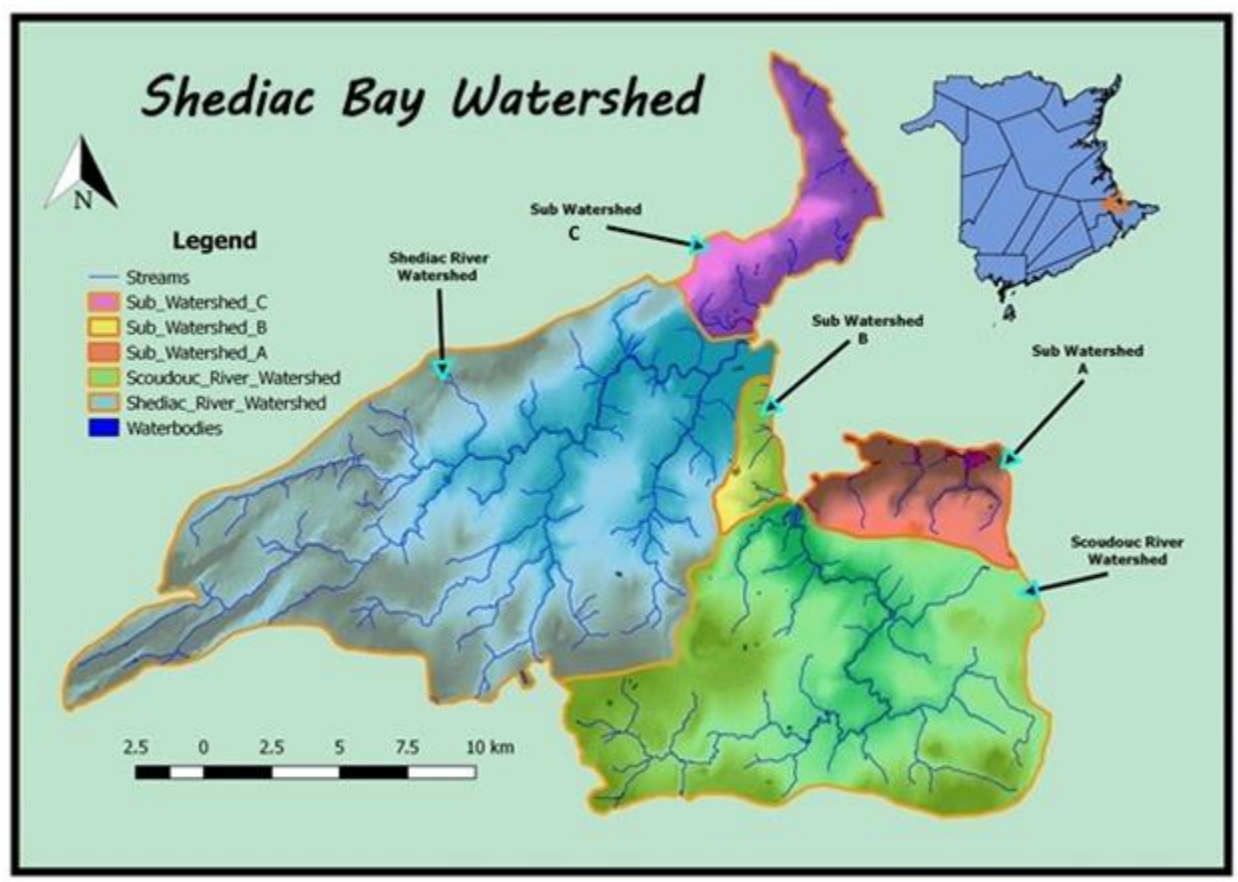


Figure 1: Map of Shediac Bay watershed boundaries

## 2 Water Conservation and Stormwater Management

The Shediac Bay Watershed Association (SBWA) has a mandate to protect and enhance water quality throughout the watershed. The water quality in the saltwater ecosystems of the bay is influenced by the quality of the freshwater rivers and streams that flow into it. In order to ensure good water quality in the Shediac Bay, there must be proper management of surface water and land uses in the watershed as a whole.

Studies have provided data on the levels of bacteria and other pollutants contained in stormwater runoff in the Shediac Bay watershed. Numerous recommendations for watershed management strategies include the use of bioretention systems such as bioswales and rain gardens. By absorbing stormwater runoff, rain gardens help reduce the volume of stormwater entering our storm sewers and small streams, all of which drains into the Shediac Bay. By filtering stormwater runoff, bioswales improve the quality of the water that is discharged into the environment. The SBWA is working to create on-the-ground projects to increase the network of bioretention systems in the watershed.



**Figure 2: A Bioretention System in the Shediac Bay Watershed**

Since 2017, the SBWA’s education program has been focused on the theme “Water Conservation & Stormwater Management”. The topic of stormwater management revolves around the concerns from the public on the water quality of the Shediac Bay. Bacterial spikes occur primarily after rain events. Common confusions regarding beach closures in relation to rain require greater public education on the watershed system and land uses as a whole.

The program also educates on the use of green infrastructure and rainwater collection for climate change adaptation. The climate change predictions for the Maritime Provinces, as described by the Department of Environment and Local Government of New Brunswick; “Wetter, Warmer and Stormier.” The predictions include an increase in the frequency and severity of heavy rainfall events, which will inevitably cause greater risk of erosion, stress on infrastructure, runoff and flooding. (Government of New Brunswick, 2018). The use of rain barrels helps address the challenges faced with longer periods of drought becoming more frequent. Certain regions in Atlantic Canada have already seen drinking wells runs dry during periods of drought in recent years.

The following section reports on the maintenance and enhancement of existing green infrastructure projects, the new residential rain garden program and the rain barrel distribution program.



## 2.1 Shediac Municipal Centre of Operations - Naturalized Stormwater Retention Basin

In partnership with the Town of Shediac, a stormwater retention basin at the municipal centre of operations was transformed into a bioretention system in 2019. The municipal garages are located on Ohio Road, next to the Shediac water tower. The standard dry pond was naturalized with bulrush vegetation that will filter the surface runoff before it is released into the environment. The stormwater discharged from this site flows down Ohio Rd. to a small tributary of the Shediac Bay, draining to the east of Parlee Beach.

The stormwater retention basin was modified by removing approximately 1.5 metres in width of sod from the bottom of the basin, spanning the length of the structure. Rock check dams and top soil were added to create a habitat for the vegetation. Cattail plants and rhizomes were collected from a donor bed and planted into the swale. Other wild plants such blue flag iris, native rush and native sedge were also transplanted into the system. Cattail seeds were added in the fall of 2019.



**Figure 3: Shediac Municipal Centre of Operation Naturalized Stormwater Retention Basin – Before (05/2019) and After (08/2020)**

In the spring of 2020, additional cattail plants were planted to increase the density of vegetation. Despite the heat and drought conditions of the following summer, the cattails grew and thrived in the basin. As the vegetation continues to establish itself along the basin, the filtration performance of the system will increase over time. In theory, the stormwater runoff being discharged from the naturalized retention basin will be of improved quality than the water that originally entered.



**Figure 4: Hardy cattail growth (August 2020)**

Additional funding was received to evaluate the performance of the bioretention system. Water quality samples of the stormwater entering and exiting the system were collected following a heavy rain event. The sampling took place during hurricane Teddy on September 22. The sampling collected the following data: physical parameters using a YSI probe, bacteria (*E. coli*), inorganic elements including nutrients, heavy metals and hydrocarbons.



**Figure 5: Bioretention System – Water Inlet**

The sampling results were very interesting for the bacteria. The water being discharged from the system contained 84% less *E. coli* per 100 mL; stormwater entering contained 253 MPN/100 mL and water exiting contained 41 MPN/100 mL. The hydrocarbon test was inconclusive as all level from the water samples were below the detection levels. The sampling for nutrients and heavy metals were also inconclusive for this round of sampling due to the richness of the top soil used in the project. Further testing is planned for this bioretention system.



**Figure 6: Bioretention System Inlet and Outlet - Rain Event Sampling (September 22, 2020)**



## 2.2 Rain Garden – Vestiaire St. Joseph

In 2017, the Association built its first demonstration rain garden to capture the runoff from the parking lot of the *Vestiaire St. Joseph* and the Shediac Centennial Park. It is the oldest and most mature rain garden in Shediac. Most species of plants and shrubs are growing densely and are becoming well established. However, to address the mortality of certain plants, additional vegetation was planted in two sections of the garden in June of 2020.



**Figure 7: Vestiaire St. Joseph Rain Garden, Spring 2020**

Seedlings of Swamp Milkweed was received from the *Groupe de Développement Durable du Pays de Cocagne*, as part of their Monarch Butterfly project. The Swamp Milkweed (*Asclepias incarnata*) is the host plant for the endangered species. The seedlings were planted in the rain garden to help support the reproduction of monarch butterflies. Sensitive ferns (*Onoclea sensibilis*) were also added to the rain garden. Composted mulch was also added in the fall.



**Figure 8: Addition of Swamp Milkweed and Sensitive Ferns (June 2020)**



**Figure 9: Vestiaire St.-Joseph Rain Garden in Bloom (August 2020)**



## 2.3 Rain Garden at Shediac Cape School

In October of 2020, additional plants were added to the rain garden at the Shediac Cape School. More plants were needed to replace the vegetation that did not survive the first two years. This site receives an enormous volume of flood waters in the spring, and only flood-tolerant plants can survive in this garden.

An activity was planned with the 7-8<sup>th</sup> grade students of the elementary school, where they would receive an outdoor presentation and assist with the maintenance of the rain garden. Unfortunately, a sudden change in restrictions for the Health Zone 1 by the Department of Health forced the cancellation of the school activity. The maintenance was then done by SBWA staff outside of school hours.



**Figure 10: Shediac Cape School Rain Garden, October 2020**



**Figure 11: Shediac Cape School Rain Garden Plants (October 2020)**



## 2.4 Residential Rain Garden Program (*NEW!*)

The SBWA launched a pilot “Residential Rain Garden” program this year, with the goal of recruiting landowners of the watershed and engaging them to become stewards for water quality and stormwater management. The original strategy for this program was to host a workshop on rain gardens, and select 3 qualifying participants from the workshop to create a rain garden on their property.

Unfortunately, due to COVID-19 pandemic, the public workshop was cancelled. The strategy was changed by using social media and our newsletter to recruit homeowners who could benefit from a rain garden on their property. The advertisement included a list of criteria for homeowner eligibility. The program focused on residents living within the Town of Shediac and the local service district of Pointe-du-Chêne.

The SBWA was able to recruit 3 homeowners who have been experiencing standing water or flooding issues on their property. These residents were engaged in a written partnership agreement for the creation of a rain garden or bioswale on their property. Each rain garden is unique and tailored to the homeowner’s needs and preferences.

### 2.4.1 Residential Rain Garden #1

The first homeowner living in Pointe-du-Chêne is receiving surface water runoff from surrounding properties, whose yards are built up higher than theirs. A bioswale was installed along the backyard property line, to enhance the infiltration of the water into the ground and the absorption of the water by the plants. This bioswale offered the opportunity to beautify the homeowner’s backyard by choosing a grassy plant that will grow tall to hide the fence. Only one plant species was used in this project in accordance with the homeowner’s wishes. The bioswale was planted with Karl Foerster grass (*Calamagrostis acutiflora*).



Figure 12: Residential Bioswale #1 – Construction Photos Part 1 (August 2020)





**Figure 13: Residential Bioswale #1 – Construction Photos Part 2 (August 2020)**



**Figure 14: Rain Garden Sign Installation and Bioswale Photo in the Fall (October 2020)**



## 2.4.2 Residential Rain Garden #2

The second homeowner in Pointe-du-Chêne’s “The Bluff” has been experiencing standing water and flooding issues for many years. A large rain garden was built in a low point of the backyard. A pipe will be installed to redirect the water from their sump pump and downspout towards the rain garden. The location of the rain garden is partially shaded by trees. A mixture of flood tolerant grasses and flowers for pollinators were used in this project:

- Karl Foerster grass (*Calamagrostis acutiflora*)
- Common Rush (*Juncus effusus*)
- Ostrich Ferns (*Matteuccia struthiopteris*)
- Goldenrod (*Solidago sp.*)
- Purple Aster (*Aster sp.*)
- Swamp Milkweed (*Asclepias incarnata*)
- Wild Rose Bush (*Rosa rugosa*)



Figure 15: Residential Rain Garden #2 – Construction Photos (September 2020)





**Figure 16: Residential Rain Garden #2 – Completed (September 2020)**



**Figure 17: Residential Rain Garden #2 – Sign Installation (October 2020)**



### 2.4.3 Residential Rain Garden #3

The third rain garden was built on the neighbouring property from project #2, for the same stranding water and flooding issues. The standing water in this area created a habitat for mosquitoes and odour-causing bacteria. This rain garden will help absorb surface standing water and encourage the infiltration into the ground. This rain garden is located in a fully shaded area between the two homes. A mixture of flood and shade-tolerant plants were chosen for this project:

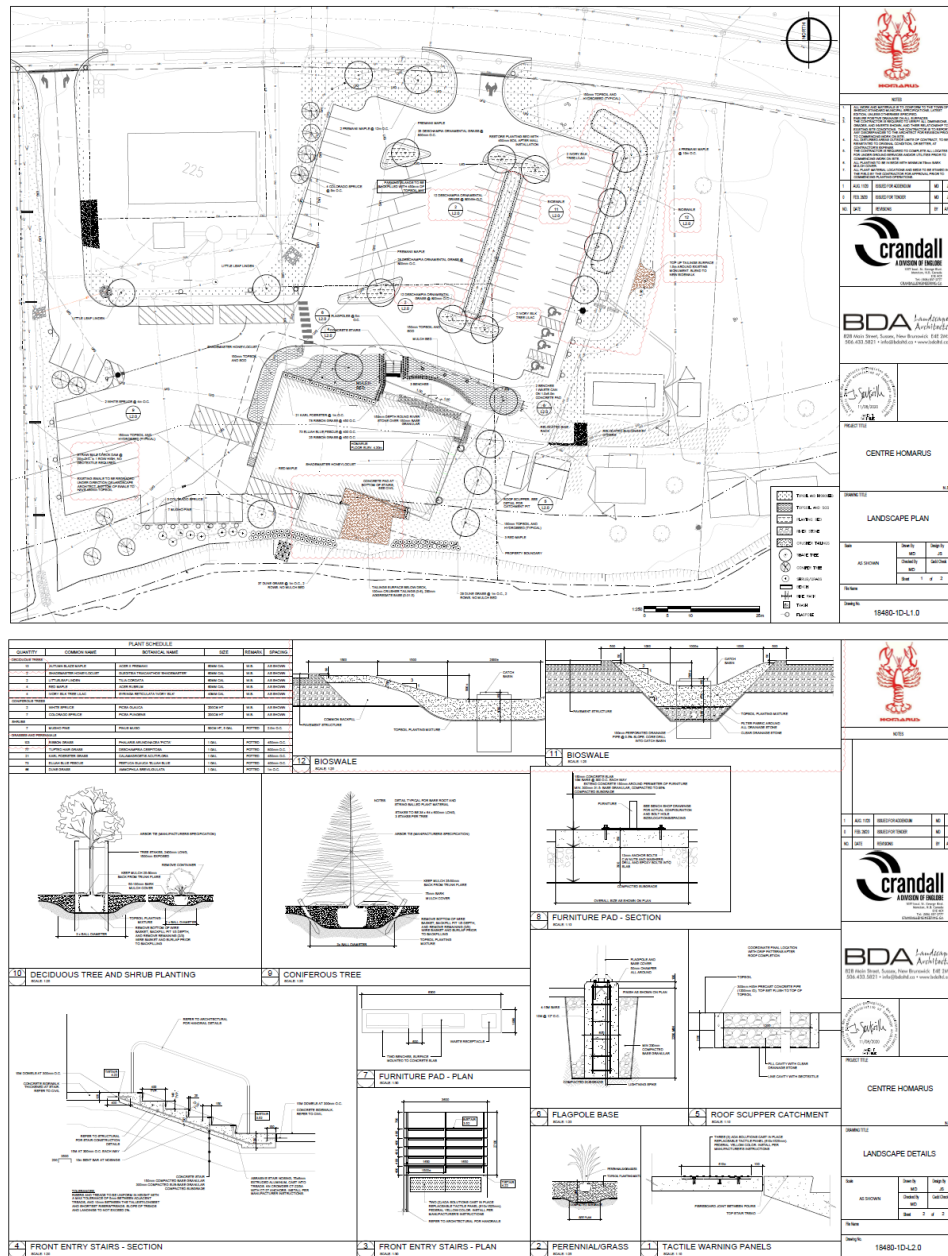
- Karl Foerster grass (*Calamagrostis acutiflora*)
- Common Rush (*Juncus effusus*)
- Ostrich Ferns (*Matteuccia struthiopteris*)
- Sensitive Ferns (*Onoclea sensibilis*)
- Swamp Milkweed (*Asclepias incarnata*)



Figure 18: Residential Rain Garden #3 – Construction Photos (September 2020)

## 2.5 Future Project Planning – Shediac Rotary Park & Homarus Bioswales

A new Homarus Eco-Centre is coming to Shediac, on the grounds of the Rotary Park and giant lobster statue. In addition to the new eco-centre, the entire site of the park will be re-arranged and the parking lots will be resurfaced. In partnership with the Town of Shediac and the Homarus Eco-Centre, the SBWA is working to incorporate stormwater management techniques within the new parking lots. Crandall Engineering amended the construction plans to incorporate bioswales in the designs. The slopes of the parking lots will be adjusted so that surface water runoff from the parking lot be directed towards the bioswales. These bioswales will be built in 2022.

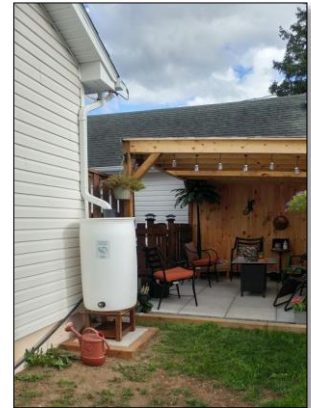




## 2.6 Rain Barrel Giveaway

Since the beginning of this project in 2016, 100 collapsible rain barrels (200L) and 48 rigid plastic food-grade rain barrels (55 Gallons) have been distributed to citizens living within the communities in the Shediac Bay watershed boundaries. This project has since sparked interest and high demand in the community, and it has proven to be an excellent tool to promote rain as a resource.

In 2020, the SBWA continued the free rain barrel giveaway program using the rigid plastic food-grade barrel model, in order to give away a more durable and higher-quality product. The 55-gallon food-grade barrels were purchased from a small Dorchester company *Eco-Containers Co.*, and the parts were purchased from local Shediac *Kent* and *Home Hardware* Stores.

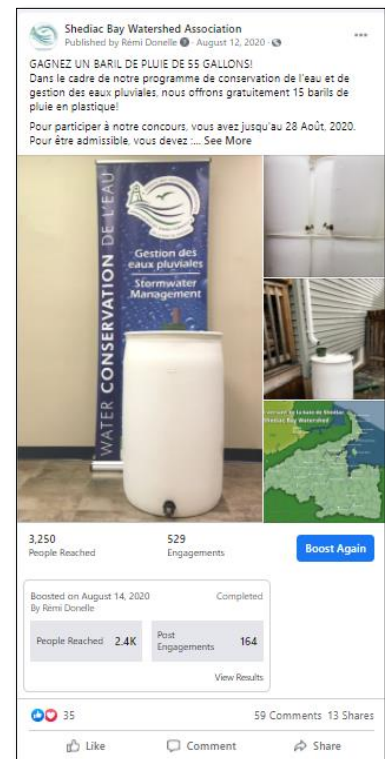


**Figure 20: Rain barrel setup in Shediac**

The food-grade barrels were in short supply due to the shut down or lowered capacity of restaurants and food transformation companies during the first few months of the pandemic. Eco-Containers was able to deliver 18 barrels in August. The SBWA staff then worked to transform the barrels into rain collectors. A social media contest was launched for the first 15 barrels. The last 3 rain barrels were reserved for the waiting list of names collected during prior events. A new weather resistant sticker was produced. The sticker contains the project title in French and English, the SBWA logo and the NB ETF logo.

The social media contest was very successful; 31 people participated in the contest. The response from social media was very positive, and the purpose of the project was understood and appreciated. For those who did not win a rain barrel in the draw, a post was created to promote the “How to Build a Rain Barrel” video on Youtube that was developed in 2018 thanks to the *NB Environmental Trust Fund*.

A COVID-19 operational procedure was developed to deliver the rain barrels safely. The barrels were delivered using masks and social distancing. The barrels were unloaded and wiped down with disinfectant. The project documents were pre-prepared in a brown envelope and given with the barrel: a rain barrel pamphlet, the rain barrel usage and maintenance guidelines, a water conservation bookmark and a newsletter. The deliveries took place in September, which is why most participants opted to install it next spring.



**Figure 21: Facebook Rain Barrel Contest Post 2020**



## 2.6.1 Rain Barrel Survey

A follow-up survey was sent to the recipients of the rain barrels, in order to evaluate the success of the program. Of the 18 rain barrel recipients, 10 responded to the survey. Of these 10 people, only 2 had already installed it, while others will install it next spring.

Half the participant rated the use of rainwater for plants and garden as extremely important. Others also placed high importance on managing stormwater and adapting to climate change. The respondents rated the quality of the barrel as very good or excellent. The 2 people who've installed it found the installation either very easy, or more or less easy. The water collected by the 2 installed barrels has been used to water their plants and flowers. All participants recommend the continuation of the program, and some provided useful feedback on how the program can be improved. The following table provides the results to the survey.

**Table 1: Rain Barrel Distribution Program Survey, 2020**

Rain Barrel Distribution Program Survey - September 2020							
Survey Respondents in English							5
Survey Respondents in French							5
Total Survey Respondents							10
Questions/Answers:							
1. What motivated you to participate in our Free Rain Barrel Distribution Program?	Not at all important	Slightly important	Moderately Important	Very Important	Extremely Important	Participant Answered	Skipped
Using rainwater for your plants and garden, to conserve potable drinking water			2	2	5	9	1
Reduction of stormwater runoff originating from the rooftop, to reduce the amount of pollution that flows into municipal stormwater sewers, streams and rivers		1	3	2	4	10	
Reduction of flooding in my yard		3	2	3	2	10	
Climate change adaptation				5	5	10	
General sustainability and environmental consciousness	1		1	3	5	9	1
Comments:							
"Really good idea love our rain barrel awesome for our veggies and fruit gardens our only issue is the barrel water comes out clean but collects black mold inside and hard to clean I would give 10 out of 10 stars if the cover could come off"							

"Water for the Birds & Squirrels, Chipmunks...my flower beds & Garden... Cleaning the glass 7 other stuff I find from the shore...even watering my houseplants."			
"Being on a well, it's important for me to conserve my water in the summer without sacrificing my garden"			
<b>2. Did you install the rain barrel?</b>	<b>Yes</b>	<b>No</b>	<b>Skipped</b>
	<b>2</b>	<b>7</b>	<b>1</b>
Yes - I installed it (Go to question 3)	2		
No - This barrel does not suit my needs			
No - I didn't have time, I will install it in the spring		7	
No - I had difficulties during the installation			
No - I do not find it necessary or important anymore			
Comments:			
"I received it at the end of summer, but it will be installed in the late spring."			
"I do have time but thought I will wait until spring o set it up so I don`t have to worry about it freezing & cracking..."			
"I got it too late, so will install in the spring"			
<b>3. How do you rate the quality of this type of rain barrel?</b>	<b>Participants Answered</b>	<b>Skipped</b>	
	<b>10</b>	<b>0</b>	
Poor			
Fair			
Good			
Very Good	4		
Excellent	6		
Comments:			
"Cover needs to be able to come off to clean the mold residue inside"			
"Knowing that there were no chemicals in the barrel, reason why I hadn't already got one... So I appreciated you letting me know that... I can't wait for spring."			
"It would be great to come with a stand...maybe to be included for future giveaways? Could source someone locally to make them in turn promoting small businesses"			
"Propre et bien fait"			
<b>4. How did you find the installation of the rain barrel? (Please go to question 6 if you have not installed the barrel)</b>	<b>Participants Answered</b>	<b>Skipped</b>	
	<b>6</b>	<b>4</b>	
Very difficult			
Difficult			
More or less easy	3		
Very Easy	3		
Comments:			

"Pas encore installer"		
<b>5. Did you use the rainwater collected by the barrel? (Please go to question 6 if you have not installed the barrel)</b>	<b>Participants Answered</b>	<b>Skipped</b>
	<b>4</b>	<b>6</b>
Yes - Watering of plants and flowers	2	
Yes - Watering the garden		
Yes - Washing the Car		
No	2	
Other? (Comments):		
"Not installed yet"		
"Pas encore installer"		
<b>6. Would you recommend extending this Free Rain Barrel Distribution Program?</b>	<b>Participants Answered</b>	<b>Skipped</b>
	<b>10</b>	<b>0</b>
Yes	10	
No		
Comments:		
<b>Do you have any other comments or suggestions that would help us improve this program?</b>	<b>Participants Answered</b>	<b>Skipped</b>
	<b>10</b>	<b>0</b>
Yes (See comments)	6	
No	4	
Comments:		
"I'm not sure if you already do, but it would be great if you would advertise these rain barrels, how to use them, the cost & how to purchase them."		
"I believe everyone should have one or more of these barrels saves damage to your home, etc.... all kinds of uses..."		
"Please see notes in earlier question in regards to a stand"		
"Faire plus de promotion sur les réseaux sociaux... Continue votre beau travail dans la région. Excellent"		
"J'aimerais qu'il serait possible d'avoir l'option de l'utiliser avec le système de « gutter » ou non, comme ça si une année on veut le placer sous le gutter on peut, et si une année on veut le mettre a cote du jardin pour qu'il collecte l'eau de pluie on peut... Mais ce n'est p-e pas possible ou il est p-e simplement préférable d'en avoir 2 pour le jardin... de toutes façons, j'aime beaucoup le concept !!!"		
"Continuer votre beaux travail"		

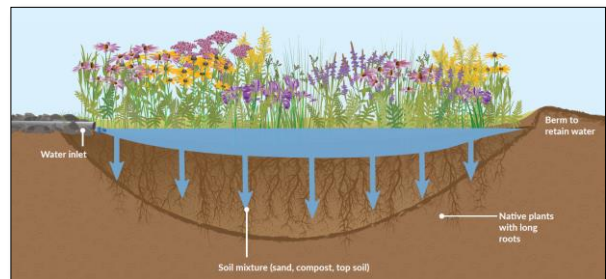
### 3 Education Materials

The development of educational materials is an integral part of our education program. In 2020-21, significant work was done on illustrative designs and informative videos. The illustrative designs have led to new handout materials and signage on rain garden education. Improved capacity for video recording and editing have significantly increased our social media outreach.

#### 3.1 Rain Garden Guide for Homeowners

A bilingual step-by-step illustrated guide on how to build residential rain gardens was developed over the winter 2021. The 12-page guide begins with an introduction on the environmental impacts of stormwater runoff and the description of rain gardens and their benefits.

This guide is unique in having a rain garden illustration that depicts plants that are native to New Brunswick. The guide provides a list of 30 plants that are suitable for rain gardens that are native to NB. Additional information on sunlight exposure requirements, benefits to pollinators, and tolerance to inundation and drought are indicated for each plant. An example of a rain garden layout helps the homeowner design their garden using the list.



**Figure 22: Rain Garden Illustration Containing Plants Native to NB**

The next step helps the homeowner choose the suitable location for a rain garden based on several factors. The following steps teach how to do an infiltration test to determine their soil type, calculate the drainage area and calculate the slope to properly size their garden. Additional information on building a berm, designing the water inlet and overflow, shaping and edging a rain garden is provided to complete their plan.

Next is a step-by-step illustrated guide on the “boots on the ground” construction of the rain garden. It provides tips on digging, planting, adding compost and mulch. Maintenance guidelines complete the final steps.

The final page is reserved for information on the SBWA’s Residential Rain Garden program, on how rain gardens contribute to watershed management for water quality, reference documents and financial program logos.

This guide will serve as the educational material for upcoming public workshops on rain gardens. The target audience for this guide will be homeowners who are ready to start planning their own rain garden project on their property.

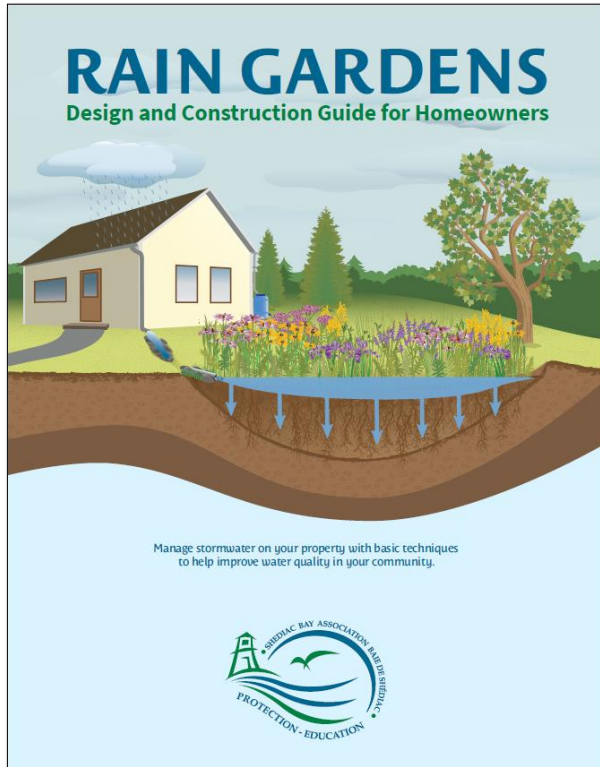


Figure 23: Rain Garden Guide for Homeowners

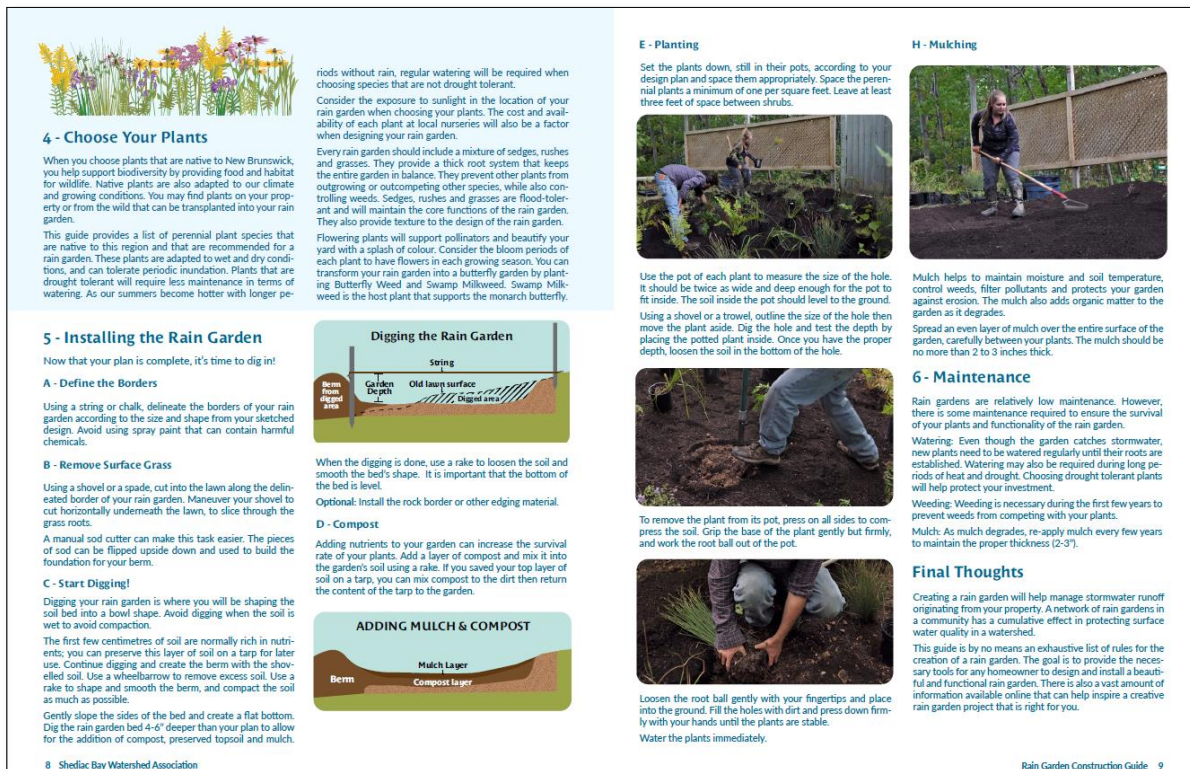


Figure 24: Rain Garden Guide for Homeowners



### 3.2 Rain Garden Brochure

A French-fold style brochure is currently being developed to serve as a sample of the newly developed rain garden guide. The brochure defines the purpose of a rain garden and provides a brief overview of the steps to building one around a house. The target audience for this brochure are members of the public who are not familiar with rain gardens but who wish to learn more.

### 3.3 Residential Rain Garden Sign

As part of the Residential Rain Garden program, a new sign was developed and installed with each homeowner's permission. The small signs are printed on metal with a mat finish.



Figure 25: Residential Rain Garden Sign for Homeowners

### 3.4 Rain Garden Video

During the installation of one residential rain garden, footage was collected to create a rain garden video for social media. The two-minute video was made bilingual with the use of subtitles. The video has been published to the SBWA's Facebook page and Youtube channel.



Figure 27: Rain Garden Video for Youtube

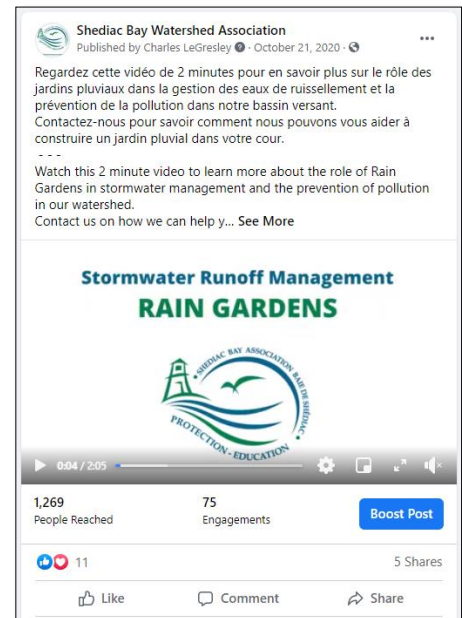


Figure 26: Rain Garden Video for Facebook

### 3.5 Rain Barrel Sticker

A weather resistant sticker was produced for the Rain Barrel Distribution program. The sticker serves to display the project title, the Shediac Bay Watershed Association’s logo and the New Brunswick Environmental Trust Fund logo on the white rain barrels.

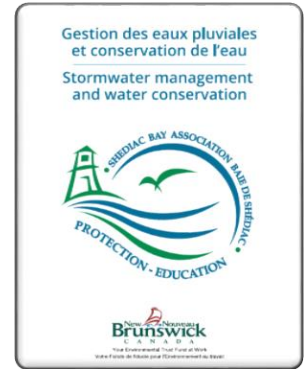


Figure 28: Rain Barrel Sticker

### 3.6 Rain Garden Course - NB Natural Infrastructure Community of Practice

In partnership with the New Brunswick Environmental Network and the Petitcodiac Watershed Alliance, a pre-recorded rain garden course is being developed. Under the federal BRACE program (Building Regional Adaptation Capacity and Expertise), a series on green infrastructure is planned for the New Brunswick “Natural and Nature-Based Climate Change Adaptation Community of Practice” website (<https://www.naturalinfrastructurenb.ca/>). The 1-hour webinar style recording will be produced by the end of March 2021.

### 3.7 The Shediac Good Times Guide – Rain Garden Advertisement

An informational rain garden page was published in the Shediac *Good Times Guide* in the Fall of 2020. A previously developed fact sheet on rain gardens was submitted to the Town of Shediac to help increase the level of communication and outreach. The guide is a mail out to all the residents of the Town of Shediac.



Figure 29: Shediac Good Times Guide Advertisement on Rain Gardens, Fall 2020

### 3.8 Educational Videos for Youtube and Social Media

The SBWA created several educational videos this year, as part of other projects and thanks to other financial partners. Each video was uploaded to the SBWA’s Youtube channel and Facebook Page.

A video was made to demonstrate a beach seine sampling showing the aquatic life at Parlee Beach, as part of the provincial park’s Blue Flag program. A video on coastal restoration using living shorelines techniques was done in partnership with Helping Nature Heal. Other videos were made on the importance of dissolved oxygen, the impacts of sedimentation in freshwater rivers and on buffer zone restoration.



Figure 30: New Videos Uploaded to Youtube



## 4 General Presentations

On a normal year, the SBWA does regular presentations to various audiences and stakeholders of our watershed. Due to the COVID-19 pandemic, activities such as public workshops or event were not possible unless they could be done virtually or following public health guidelines. There are 2 activities to report in this category for the 2020 fiscal year.

### 4.1 Bioswale Presentation to Department of Environment and Local Government

On August 17, a presentation was given to 4 provincial government employees at the site of the Shediac Municipal Centre of Operation's stormwater retention basin. The presentation was given to education and outreach coordinators of the climate change adaptation team. Technical details on the bioswale construction as well as the bioretention functions of the system was presented. The presentation was done outdoors with social distancing.

### 4.2 Virtual Workshop - Green Infrastructure

In partnership with the New Brunswick Environmental Network and other ENGO in Southeastern NB, a virtual workshop was organized on green infrastructure on December 3<sup>rd</sup>. The workshop was titled "Green Infrastructure Approaches for Stormwater Management - Case Studies from Municipalities and Homeowners." The SBWA's Project Coordinator Jolyne Hébert presented on her 2019 trip to the University of New Hampshire's Stormwater Centre visit. A recording of the presentation, titled "A Case Study of the Berry Brook Watershed Green Infrastructure Approaches, New Hampshire" is available on the NBEN Youtube Page. Approximately 75 people were in attendance during this Zoom workshop.

A second presentation on the Residential Rain Garden projects was given during a breakout room exercise. One of the partnering homeowners who received a rain garden assisted the workshop and presented on the standing water and flooding issues on their property during that breakout room. A group discussion followed the presentation.

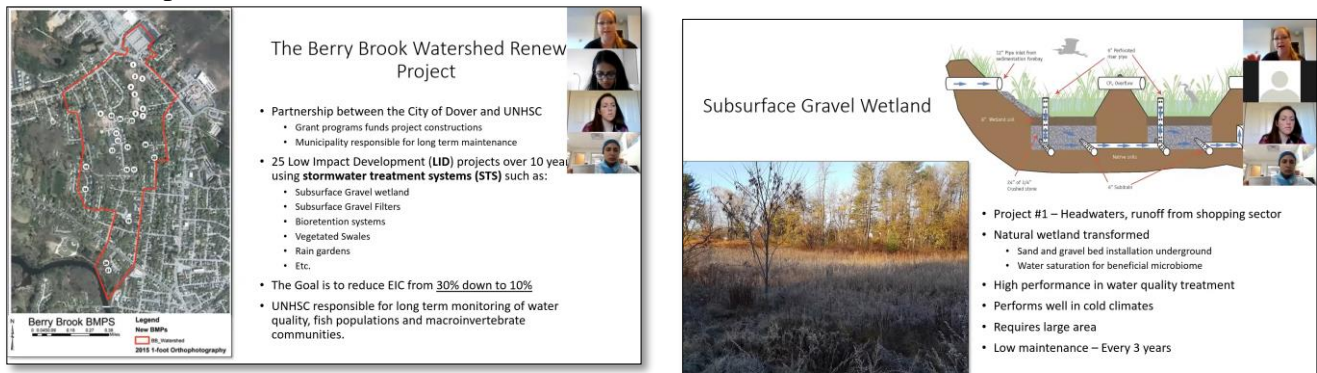


Figure 31: Virtual Workshop Screenshot (December 3, 2020)

## 5 School Programs, Field Trips and Presentations

The SBWA has been working with local schools and teachers on the development of yearly environmental education programs. This long-term relationship led to the development of a series of presentations that links science curriculum objectives and outcomes to local environmental issues. The main focus of these presentations revolves around water quality, aquatic habitats and biodiversity. In addition to the presentation series, annual programs such as Fish Friends and Adopt-A-River include field trips to further immerse the students in nature.

Due to the COVID-19 pandemic, the school programs could not be completed as usual. During the March break of 2020, the aquariums were installed in two local elementary schools. Unfortunately, sudden school closures forced the cancellation of the program. Thankfully, the fish eggs had not yet been delivered to the aquariums. The aquariums were retrieved from the schools once access was granted in June.

On a few occasions, scheduled activities were cancelled due to sudden changes in restrictions for the Health Zone 1 by the Department of Health. The SBWA made the presentations available virtually. Despite the challenges of the pandemic, a few activities were successfully completed following safety protocols.

### 5.1 Presentation Series Polyvalent Louis-J.-Robichaud - Biodiversity & Habitat Restoration

The SBWA's project coordinator assisted a teacher at the local high school with a project on biodiversity and degraded habitat restoration for the 10<sup>th</sup> grade biology students. The first part was to prepare 5 case studies of habitats degraded by natural phenomena or by human activities in the Shediac Bay watershed. The students then chose a degraded habitat case study for their project.

For their project, the students needed to build 3 food chains found in their respective habitats using species native to New Brunswick. This included a discussion on how their trophic network would be impacted by the human activities or natural phenomenon that degraded the habitat. The second part of the project was to create a restoration plan for their habitat.

The school made changes to the rules regarding special guests and classroom visits were finally allowed with masks and social distancing. In January 2021, the SBWA served as an expert guest and made 2 classroom visits for the 4 groups of 10<sup>th</sup> graders (42 students) for a total of 8 presentations. Each period began with a short



**Figure 32: SBWA Project Coordinator Jolyne Hebert**

presentation followed by a work period for the students. The project coordinator assisted the teacher in answering questions and helping the student reach the targets for their projects.

## 5.2 Canadian Wildlife Federation’s *WILD Outside!* Program

The SBWA was contacted by the program coordinator of the Canadian Wildlife Federation’s WILD Outside program to help organize an outdoor action to better the environment. A tree planting day was planned to add trees along Shediac’s bike trail by the highway 15. A hand washing station was installed and there were enough shovels to avoid equipment sharing. Everyone wore their masks at all times in accordance with the operational plan.

On Saturday, October 3<sup>rd</sup>, 15 enthusiastic teenagers planted a total of 60 native trees. A short presentation on the Acadian Forest was given upon their arrival, in a socially distanced standing circle. Once the trees were planted, the teens did a trash cleanup along the trail while waiting for their parents.



Figure 33: Hand Washing Station

After a discussion with the CWF program coordinator, a webinar presentation was requested for the youth group.

On November 3<sup>rd</sup>, a 1-hour webinar titled “Water: We All Live in a Watershed” was given and recorded for the CWF website. Due to some scheduling conflicts, only 2 students attended the webinar during the live feed, but other students expressed interest in listening to the recording.



Figure 34: CWF Webinar Screenshot (November 3, 2020)



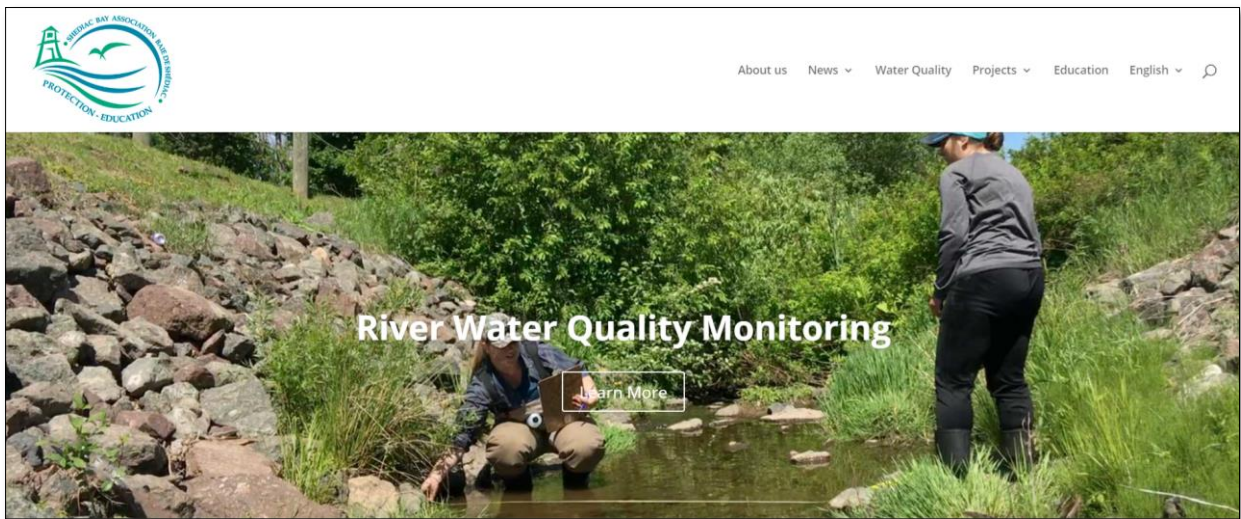
## 6 Communications and Outreach

### 6.1 Newsletter

During the 2020-2021 fiscal year, 3 bilingual newsletters were produced. The newsletters display information and photos on the various projects that the SBWA has been doing in the year. The newsletter is now distributed electronically by email list and is available on our website and Facebook page.

### 6.2 Socials Medias and Website

The SBWA is working to keep its website and social media up to date, posting photos and short description of activities and projects. The SBWA now has a dedicated employee who focuses on outreach and communications, and the design and production of educational materials.



[www.shediacbassociation.org](http://www.shediacbassociation.org)



[www.facebook.com/#!/shediacbwatershedassociation](https://www.facebook.com/#!/shediacbwatershedassociation)



<https://www.instagram.com/bvshediawatershed/?hl=en>



<https://www.youtube.com/channel/UCT1bsN08OyOeIzqqwn9ZhlQ>

### 6.3 Education Program Summary

The following table tallies the approximate numbers of people that have attended events and viewed information organized by the Shediac Bay Watershed Association in 2020-2021.

**Table 2: Program Summary**

<b>Project</b>	<b>Deliverables</b>	<b># People Reached</b>
1) Water conservation & Stormwater management	Rain Barrel giveaway	18
	Residential Rain Gardens	3
2) Public outreach activities	Bioswale Presentation to Government Staff	4
	Virtual Workshop - Green Infrastructure	75
3) Public Presentations	Bioswale Presentation to Government	4
	Virtual Workshop: Green Infrastructure Approaches for Stormwater Management - Case Studies from Municipalities and Homeowners	75
4) School Programs and Presentations	- Canadian Wildlife Federation WILD Outside Tree Planting	15
	- Canadian Wildlife Federation WILD Outside Webinar	Unknown
	- L.-J.-R. Biodiversity & Habitat Restoration Project	42
5) Communications and Outreach	-Educational Tools Developed – Guide, brochure, signage, videos, etc.	Unknown
	- 3 bilingual newsletter sent via mailing list	94
	SBWA Facebook (Total 2020-2021 outreach as reported through Facebook analytical data)	28,890 views
	SBWA Website	Unknown

## 7 Conclusion

To conclude, the SBWA plans to continue to give away free rain barrels, build rain gardens, bioswales and other green infrastructure projects as we gain more experience. These activities will continue in an effort to control stormwater runoff from impervious surfaces in the watershed, to help improve overall water quality.

This year we built three residential rain gardens and added plants to our existing rain gardens. Projects such as the new Homarus and Rotary Park bioswales have the benefit of strengthening our working relationship with the Town of Shediac and their employees. The continuation of our efforts and access to funding has also helped to build trust between the Association and the Town Councillors. Our projects are focused on finding solutions to reduce and improve the quality of surface water runoff, and educating the general public on the impacts of our daily activities in the watershed.

The rain barrel program is continuously improving and citizen of the watershed is benefitting directly from this program. The SBWA has distributed 166 rain barrels since 2016.

The school program for 2020-2021 has suffered due to the COVID-19 pandemic. As the situation evolves, the SBWA will adapt and continue to work towards environmental education and outdoor activities wherever possible.

There was a significant increase in educational materials produced this year. These materials will serve as tools for future educational initiatives.

Education has always been an important part of every project realized by the Shediac Bay Watershed Association. When dealing with local environmental issues, creating dialogue with various members of the community, of any age group, is essential to raise awareness that these issues exist. These issues need to be known and discussed in order to spark interest and change thinking patterns. As they say, knowledge is half the battle.

The Shediac Bay Watershed Association is becoming more and more known for its good work in enhancing the overall health of the Shediac Bay, and that would not be possible without our maintained presence in the public eye through our education programs. The support from the NB Environmental Trust Fund is essential for our group to be able to accomplish the quantity and variety of activities for the community. We hope to continue expanding our programs in future years.



# Annex 1 – Summer 2020 Newsletter (English)

## Current News

Number 21 Summer 2020



### Educational Program for the Preservation of Coastal Zones

Coastal areas are important for maintaining a good marine environment. However, these areas are heavily developed around Shediac Bay and many natural environments have been disturbed.

The Shediac Watershed Association will work with other environmental groups in the area, namely the Pays de Cocagne Sustainable Development Group and Vision H2O, to develop an educational program on best practices to protect the coast in a natural way.

The groups want to establish a network of demonstration sites for best practices in coastal conservation. In 2020, one or two coastal restoration sites will be established in Shediac or Pointe-du-Chêne. There may be a workshop on coastal management with a limited number of people if health restrictions permit.

### Message from the Association's Manager



Rémi Donelle is the Manager of the Shediac Bay Watershed Association since 2013. A board of directors, consisting of 20 citizens from the region, is responsible for administering the organization.

The COVID-19 pandemic arrived in New Brunswick at the end of our fiscal year. It's usually at this time that we finalize our projects and are in the process of writing final reports. Employees of the Shediac Bay Watershed Association were able to adapt quickly to telework and complete the reports. For the time being, employees will continue to work remotely.

Our work teams will also be reduced this year in order to comply with the province's hygiene regulations. Please note that our office is closed to the public and meetings are by appointment only.

Fortunately, the Province of New Brunswick has continued to financially support our programs through the Environmental Trust Fund and the Wildlife Trust Fund. In 2020, the SBWA is continuing its programs of water quality monitoring, stormwater management and ecological restoration of streams and wetlands. We are adding a new program for coastal restoration and erosion protection using vegetation.

### Clean-Drain-Dry Program

The Association helps promote the Canadian Invasive Species Council's program to reduce the spread of undesirable aquatic species. The program targets boat owners to ensure that they clean, empty and dry all boats, trailers, engines and equipment before changing water bodies. This practice helps prevent the introduction of invasive species such as green crab or invasive tunicates into New Brunswick bays.

A sign is provided by the New Brunswick Invasive Species Council and will be installed at the Shediac Bay Yacht Club. The Yacht Club has received Blue Flag certification and is committed to promoting good environmental practices in the region.

Follow this link for more info on the program.

<https://bit.ly/2Zuig9l>

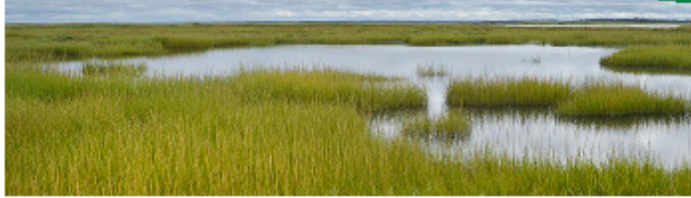




# Annex 2 – Summer 2020 Newsletter (French)

## Nouvelles du Courant

Numéro 21 Été 2020



### Programme éducatif pour la sauvegarde des zones côtières

Les zones côtières sont importantes pour le maintien d'un bon environnement marin. Par contre, ces zones sont fortement développées autour de la baie de Shédiac et de nombreux milieux naturels ont été perturbés.

L'Association du bassin versant de la baie de Shédiac va travailler avec les autres groupes environnementaux de la région, soit le Groupe de développement durable du Pays de Cocagne et Vision H2O, afin d'élaborer un programme éducatif sur les bonnes pratiques pour sauvegarder la côte de façon naturelle. Les groupes veulent instaurer un réseau de sites de démonstration de meilleures pratiques de conservation de la côte. En 2020, il y aura l'implantation d'un ou deux sites de restaurations côtières à Shédiac ou Pointe-du-Chêne. Il y aura possiblement un atelier sur la gestion de la côte avec un nombre limité de personnes si les restrictions sanitaires le permettent.

### Programme Nettoyez - Videz- Séchez

L'Association aide à faire la promotion du programme du Conseil canadien sur les espèces envahissantes qui vise à réduire la propagation d'espèces aquatiques indésirables. Le programme vise les propriétaires de bateau pour s'assurer qu'ils nettoient, vident et séchent toutes les embarcations, les remorques, les moteurs et les équipements avant de changer de plan d'eau. Cette pratique aide à prévenir l'introduction d'espèces envahissantes telle que le crabe vert ou de tuniciers envahissants dans les baies du Nouveau-Brunswick.

Une enseigne est fournie par le conseil des espèces invasives du Nouveau-Brunswick et sera installée au Yacht Club de la baie de Shédiac. Le Yacht Club a reçu la certification pavillon bleu et s'engage à faire la promotion de bonnes pratiques environnementales dans la région. Suivez ce lien pour plus d'info sur le programme. - <https://bit.ly/3iiFjMX>

### Message du Gérant de l'Association



Rémi Donelle est Gérant de l'Association du bassin versant de la baie de Shédiac depuis 2013. Un conseil d'administration, composé d'une vingtaine de citoyens de la région permet d'assurer la direction de l'organisme.

La pandémie de la COVID-19 est arrivée au Nouveau-Brunswick à la fin de notre année financière. C'est habituellement à ce moment que nous finalisons nos projets et que nous rédigeons les rapports finaux. Les employés de l'Association du bassin versant de Shédiac ont pu s'adapter rapidement au télétravail et terminer les rapports. Pour l'instant, les employés vont continuer à travailler à distance.

Nos équipes de travail seront également réduites cette année afin de respecter les consignes d'hygiène de la province. Veuillez noter que notre bureau est fermé au public et que les rencontres se font uniquement sur rendez-vous.

Heureusement, la province du Nouveau-Brunswick a continué de soutenir financièrement nos programmes par le biais du Fonds en fiducie pour l'environnement et le Fonds en fiducie pour la faune. En 2020, l'association poursuit ses programmes de surveillance de la qualité de l'eau, de gestion des eaux pluviales ainsi que la restauration écologique des cours d'eau et des milieux humides. Nous ajoutons un nouveau programme de restauration des côtes et de la protection contre l'érosion en utilisant la végétation.



Éducation et sensibilisation



Qualité de l'eau



Protection et restauration



# Annex 3 - Fall 2020 Newsletter (English)

## CurrentNews

Number 22 Fall 2020



### Natural Coastal Restoration and Erosion Control with the 'Living Shorelines' Method

New Brunswick's coasts are vulnerable to erosion and sea level rise due to climate change. The Shediac Bay Watershed Association is exploring various methods of adaptation using natural methods.

Ocean Surf Campground's owner approached the Association in 2019 following Hurricane Dorian. They wanted to repair the damage caused by the hurricane by using environmentally friendly methods instead of riprap. This site was chosen as a pilot project for the region to develop new techniques.

In order to improve our coastal restoration capabilities, two workshops were held to present the 'Living Shorelines' method to Watershed groups and riverfront property owners. Rosmarie Lohnes of Helping Nature Heal Inc., an expert in natural coastal restoration, presented various techniques for stabilizing shorelines using plants and natural materials. These techniques were then put into practice during the workshop.

A workshop took place in Pokemouche, in the Acadian Peninsula. With the help of workshop participants, an eroding shoreline was restored in the river's estuary. The second workshop targeted a shoreline next to a marsh in Pointe-du-Chêne. More than 60 participants registered to learn and participate in the ecological shoreline restoration.

This project was made possible through a partnership with the Acadian Peninsula Regional Services Commission and several local groups. The workshop in the Southeast was organized with two other environmental groups, the Pays de Cocagne Sustainable Development Group and Vision H2O.

Other coastal protection and restoration initiatives will be implemented in the coming years.

### Message from the Association's Manager



Rémi Donelle is the Manager of the Shediac Bay Watershed Association since 2013. A board of directors, consisting of 20 citizens from the region, is responsible for administering the organization.

The activities of the Shediac Bay Watershed Association were able to continue this summer despite the COVID-19 pandemic. We worked in small teams to implement the actions that will be presented in this newsletter.

However, our public engagement activities have been put on hold for 2020, including our annual tree planting event. We did manage to organize a tree planting activity with a group of youths affiliated with the Canadian Wildlife Federation who contacted us for a volunteer work opportunity.

I hope that we can resume our volunteer activities next spring, starting with the coastal and road clean-up. In the meantime, you will be able to follow the progress of our projects on our Facebook page and our website.



# Annex 4 - Fall 2020 Newsletter (French)

## Nouvelles du Courant

Numéro 22 Automne 2020



### Restauration naturelle des côtes et lutte contre l'érosion avec la méthode des *Côtes vivantes*

Les côtes du Nouveau-Brunswick sont vulnérables à l'érosion et à l'élévation du niveau de la mer en raison des changements climatiques. L'Association du bassin versant de la baie de Shédiac explore diverses méthodes d'adaptation en utilisant des méthodes naturelles.

La propriétaire du terrain de camping Ocean Surf a approché l'Association en 2019 à la suite de l'ouragan Dorian. Elle souhaitait réparer les dommages causés par l'ouragan en utilisant des méthodes écologiques au lieu d'un enrochement. Ce site a été choisi comme projet pilote pour la région afin de développer de nouvelles techniques.

Afin de développer nos capacités en restauration côtière, deux ateliers d'apprentissage sur la méthode des '*Côtes vivantes*' ont été organisés. Rosmarie Lohnes, de Helping Nature Heal Inc, une experte en restauration naturelle des côtes, a présenté diverses techniques de stabilisation des rivages à l'aide de plantes et de matériaux naturels. Ces techniques ont ensuite été mises en pratique au cours de l'atelier.

Un atelier a eu lieu à Pokemouche, dans la Péninsule acadienne. Avec l'aide des participants à l'atelier, un rivage durement affecté par l'érosion a été restauré dans l'estuaire de la rivière. Le deuxième atelier a ciblé un rivage situé à côté d'un marais à Pointe-du-Chêne. Plus de 60 participants ont répondu à l'appel pour apprendre et participer à la restauration écologique de cette côte.

Ce projet a été rendu possible grâce à un partenariat avec la Commission des services régionaux de la Péninsule acadienne et plusieurs groupes locaux. L'atelier dans le Sud-est a été organisé avec deux autres groupes environnementaux, le Groupe de développement durable du Pays de Cocagne et Vision H2O.

D'autres initiatives de protection et de restauration des côtes seront mises en œuvre dans les années à venir.

### Message du Gérant de l'Association



Rémi Donelle est Gérant de l'Association du bassin versant de la baie de Shédiac depuis 2013. Un conseil d'administration, composé d'une vingtaine de citoyens de la région permet d'assurer la direction de l'organisme.

Les activités de l'Association du bassin versant de la baie de Shédiac ont pu se poursuivre cet été malgré la pandémie de COVID-19. Nous avons travaillé en petites équipes pour mettre en œuvre les actions qui seront présentées dans ce bulletin.

Toutefois, nos activités d'engagement du public ont été mises en veilleuse pour 2020, y compris notre événement annuel de plantation d'arbres. Nous avons quand même réussi à organiser une activité de plantation d'arbres avec un groupe de jeunes affiliés à la Fédération canadienne de la faune qui nous a contactés pour une opportunité de travail bénévole.

J'espère que nous pourrions reprendre nos activités de bénévolat au printemps prochain, en commençant par le nettoyage des côtes et des routes. En attendant, vous pourrez suivre l'évolution de nos projets sur notre page Facebook et notre site web.





# Annex 5 - Winter 2021 Newsletter (English)

## CurrentNews

Number 23 Winter 2021



### Message from the Association's Manager



### Water Quality Sampling Results for 2020

In 2020, the Shediac Bay Watershed Association was able to increase the number of sample sites thanks to a partnership with the Coalition for the Sustainability of the Southern Gulf of Saint Lawrence. The new sites targeted agricultural areas and small streams to help determine the impact of nutrients and bacteria in the Shediac Bay Estuary.

Reports summarizing the samples will be released in March 2021. However the data collected is currently available on the [Atlantic Datastream portal](#). The portal regroups water quality data collected by governments, academics and environmental organizations.

The Atlantic Datastream allows you to view and compare data from different [sites](#). A new feature was added to apply national water quality guidelines to certain datasets. The portal uses the Canadian Water Quality Guidelines for the Protection of Aquatic Life, which are national standards set by the Canadian Council of Ministers of the Environment (CCME). These guidelines provide recommended ranges for some of the physical, chemical and biological characteristics that are commonly monitored in rivers.

These tools allow us to rapidly see whether our data falls within the range of acceptable water quality for aquatic life. Other guidelines are also used for recreational waters and drinking water. To view a sample pH guideline, follow this [link](#).

Rémi Donelle is the Manager of the Shediac Bay Watershed Association since 2013. A board of directors, consisting of 20 citizens from the region, is responsible for administering the organization.

The year 2020 has been a success despite COVID-19. I would like to thank my team for their resilience in adapting their work during a pandemic. The field projects could be accomplished by a small team in accordance with public health guidelines. Unfortunately, our educational activities with schools were suspended this fall. However, these partnerships will be resumed as soon as possible.

In the new year, the Association will work on the implementation of a new management plan for the Shediac Bay watershed. The plan that was developed by the Ministry of Environment and Local Governments will be available for public consultation in February. You will be able to comment on the [Government of NB site](#).





# Annex 6 - Winter 2021 Newsletter (French)

## Nouvelles du Courant

Numéro 23 Janvier 2021



### Résultats de l'échantillonnage de la qualité de l'eau pour 2020

En 2020, l'Association du bassin versant de la baie de Shediac a pu augmenter le nombre de sites d'échantillonnage grâce à un partenariat avec la Coalition pour la viabilité du sud du Golfe du Saint-Laurent. Les nouveaux sites ont ciblé les zones agricoles et les petits cours d'eau pour aider à déterminer l'impact des nutriments et des bactéries dans l'estuaire de la baie de Shediac.

Des rapports résumant les échantillons seront publiés en mars 2021. Toutefois, les données recueillies sont actuellement disponibles sur le portail [Atlantic Datastream](#). Ce portail regroupe les données sur la qualité de l'eau recueillies par les gouvernements, les universitaires et les organisations environnementales.

L'Atlantic Datastream permet de visualiser et de comparer les données provenant de différents sites. Une nouvelle fonctionnalité a été ajoutée pour appliquer certaines recommandations nationales en matière de qualité de l'eau à certains ensembles de données. Le portail utilise les recommandations canadiennes pour la qualité des eaux en vue de la protection de la vie aquatique qui sont des normes nationales établies par le Conseil canadien des ministres de l'Environnement (CCME). Ces lignes directrices fournissent des valeurs recommandées pour certaines des caractéristiques physiques, chimiques et biologiques qui sont couramment surveillées dans les rivières.

Ces outils nous permettent de voir rapidement si nos données se situent dans la fourchette de qualité d'eau acceptable pour la vie aquatique. D'autres recommandations sont également utilisées pour les eaux de loisirs et l'eau potable. Pour voir un exemple de directives sur le pH, suivez ce [lien](#).

### Message du Gérant de l'Association



Rémi Donelle est Gérant de l'Association du bassin versant de la baie de Shediac depuis 2013. Un conseil d'administration, composé d'une vingtaine de citoyens de la région permet d'assurer la direction de l'organisme.

L'année 2020 a été un succès malgré la COVID-19. Je tiens à remercier mon équipe qui a su faire preuve de résilience pour s'adapter à travailler durant une pandémie. Les projets sur le terrain ont pu être accomplis par une équipe réduite en respectant les consignes de la santé publique. Malheureusement, nos activités éducatives avec les écoles ont été suspendues cet automne. Par contre ces partenariats seront repris aussitôt que possible.

Dans la nouvelle année, l'Association va travailler sur l'implémentation d'un nouveau plan de gestion pour le bassin versant de la baie de Shediac. Le plan qui a été développé par le ministère de l'Environnement et des Gouvernements locaux sera disponible pour consultation publique en février. Vous pourrez faire des commentaires sur le [site du gouvernement du NB](#).





## Appendix A – ETF Program Priority Areas

Project: 200165- Education on Water Conservation and Stormwater Management

<b>Priority Area: Protecting Our Environment</b>	<b>Results</b>
<i>1) Water quality improvements (e.g. water quality monitoring, benthic invertebrate sampling).</i>	
Residential Rain Gardens	3
Rain Barrels Distributed	18
Bioswale Water Quality Sampling	2 Sample Locations (14 sampling bottles)
<i>3) Communications and awareness (e.g. conferences, education materials).</i>	
Guide, brochures and signage	5
Newsletters	3
Videos	6
Pre-recorded webinar course	1
<b>Priority Area: Increasing Environmental Awareness</b>	<b>Results</b>
<i>Record: A) Number of participants B) Type of activity: 1) Active learning (e.g. workshop, 'in the field', hands-on), or 2) Observing (e.g. presentation) C) Activity duration (number of hours)</i>	
Bioswale Presentation to Government (in the field)	4 participants
Virtual Workshop on Green Infrastructure	75 participants
CWF in-the-field learning and tree planting	15 participants
CWF Webinar	2+ participants
School visits Polyvalent Louis-J.-Robichaud, presentations (2 presentations per group x 4 groups)	42 students
<b>Activity duration (number of hours)</b>	<b>16.5 hours</b>

# Appendix B - Educational Materials Collection

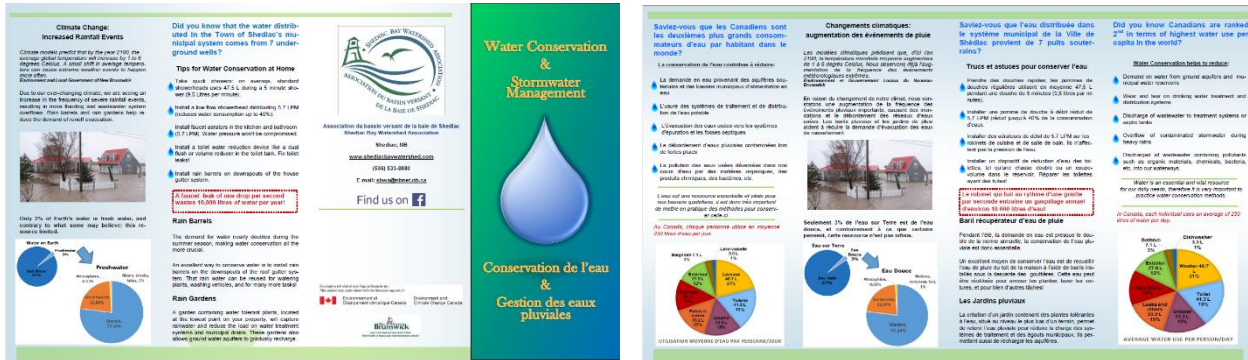


Figure 35: Water Conservation & Stormwater Management pamphlet



Figure 36: Infographics and posters







Figure 39: Interpretation panels developed in 2017



Figure 40: Interpretation panel collection developed in 2015