Integrated Watershed Management Plan

SHEDIAC BAY WATERSHED 2021-2031

OCTOBER 2021

Acknowledgements

We would like to begin by acknowledging the work of the Technical Working Group that helped develop this report with the participation of the Mi'gmaq people, residents of the Shediac Bay Watershed, and numerous stakeholders.

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- Kevin Gould, P.Eng., Acting Director, Healthy Environments Branch (on behalf of the Department of Health);
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- Wenona LaBillois, Fisheries Program Coordinator, Mi'gmawe'l Tplu'taqnn Inc.

Cover page photo credit: Shediac River by Karen Buchanan and Emery Robidoux, 2020

Shediac Bay Watershed Partners

Partnerships are critical in ensuring the successful development and implementation of a watershed management plan as they will encourage local ownership and participation. Partnerships can build a climate of cooperation and a focus on solutions. A plan developed by local partnerships can be very effective and efficient especially when it comes to addressing issues that cannot be fully solved through regulations, such as managing non-point sources of pollution. This type of pollution results from a variety of activities over a wide area (e.g. overland run off that transports sources of contamination prior to reaching a watercourse).

The Shediac Bay Watershed partners listed below have expressed an interest in taking part in the implementation of the Shediac Bay Watershed Management Plan. They acknowledge the importance of working together to implement the actions listed herein. These actions will help protect and improve water quality in the Shediac Bay Watershed and at Parlee Beach in the long-term.

- Agricultural Alliance of New Brunswick
- ATV Country Wheelers Club
- Buctouche, Eel Ground, Fort Folly, and Indian Island First Nations
- City of Dieppe and City of Moncton
- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Fort Folly Habitat and Restoration
- Greater Shediac Chamber of Commerce
- Greater Shediac Sewerage Commission
- Kent Regional Service Commission
- Local service districts of Dundas, Grand Digue, Moncton, Pointe-du-Chêne, Scoudouc, Scoudouc Road, Shediac, Shediac Cape, and Shediac River-Shediac Bridge
- Mi'gmawe'l Tplu'taqnn Inc.
- New Brunswick Department of Agriculture, Aquaculture and Fisheries
- New Brunswick Department of Environment and Local Government
- New Brunswick Department of Health
- New Brunswick Department of Justice and Public Safety
- New Brunswick Department of Natural Resources and Energy Development
- New Brunswick Department of Tourism, Heritage and Culture
- New Brunswick Department of Transportation and Infrastructure
- New Brunswick Soil and Crop Association
- Red Dot Association of Shediac Bay
- Shediac Bay Watershed Association
- Shediac Bay Yacht Club and Pointe-du-Chêne Harbour Authority
- South East Regional Service Commission
- South East Wood Marketing Board
- Town of Shediac
- Université de Moncton

Executive Summary

Water quality at Parlee Beach has been an area of concern for residents, cottage owners and visitors of the Shediac Bay Watershed for many years. The near shore coastal portion of the watershed which includes Parlee Beach is considered the receptor environment of the Shediac Bay Watershed. Water quality at Parlee Beach is therefore influenced by water quality in the Shediac Bay Watershed. For the past few years, the Government of New Brunswick has been supporting a series of studies to help better understand the water quality concerns. Information gathered to date suggests water quality at Parlee Beach is very good most of the time, however, there are water quality issues in the Shediac Bay Watershed that should be addressed. The Shediac Bay Watershed Management Plan (WMP) has been developed to help address water quality issues in the watershed which will in turn help protect and improve water quality at Parlee Beach.

The primary concerns raised by First Nations and stakeholders during the development of the Watershed Management Plan included the **impacts of stormwater** on water quality and quantity; the **impacts of agricultural activities** on water quality, the **Greater Shediac Sewerage Commission's lift stations**, some of which periodically overflow during heavy rain events, inadequate **on-site septic systems** in the un-serviced areas of the watershed, **land development** in ecologically sensitive areas, and the need for greater **protection of wetlands and riparian zones**.

There are ten (10) established long-term monitoring sampling sites in the Shediac Bay Watershed. Four sampling sites are located in the Scoudouc River sub-watershed and six in the Shediac River sub-watershed. The Water Quality Index (WQI) developed by the Canadian Council of Ministers of the Environment (CCME) was applied to water quality data collected at the 10 freshwater sampling sites within the Shediac Bay Watershed over a three-year period (2018-2020). The WQI is a number between 0 and 100, with zero representing poor water quality and 100 representing excellent water quality. Of the ten (10) sampling locations evaluated using the WQI, three sites fell in the "good" category; six in the fair category, and one site fell in the "marginal" category.

The Watershed Management Plan has established seven goals related to water quality and provides a list of 26 actions to achieve those goals: **Goal #1:** Implement the Watershed Management Plan; **Goal #2:** Protect and Improve Water and Habitat Quality in the Shediac Bay Watershed; **Goal #3:** Improve Stormwater Management in the Shediac Bay Watershed; **Goal #4:** Improve Wastewater Management in the Shediac Bay Watershed; **Goal #5:** Protect the Coastal Areas of the Watershed; **Goal #6:** Education, Awareness and Communication, and **Goal #7:** Protect Water Quality at Parlee Beach.

The Shediac Bay Watershed Management Plan is not regulatory in nature. The use of a partnership-based approach will therefore be critical for the successful implementation of the plan as it will encourage local ownership and participation. Partnerships can build a climate of cooperation and a focus on solutions. A plan developed by local partnerships can be very effective and efficient in a non-regulatory environment. As actions are implemented, long-term water quality monitoring should continue to help determine the effectiveness of the plan and inform any additional actions that may be needed. This "Adaptive Management" approach will allow flexibility to respond to new or on-going challenges as more information is gathered. Finally, the Watershed Management Plan Implementation Committee should communicate the progress of the plan on a regular basis to all parties who have a vested interest in protecting this watershed in a continued effort to maintain transparency.

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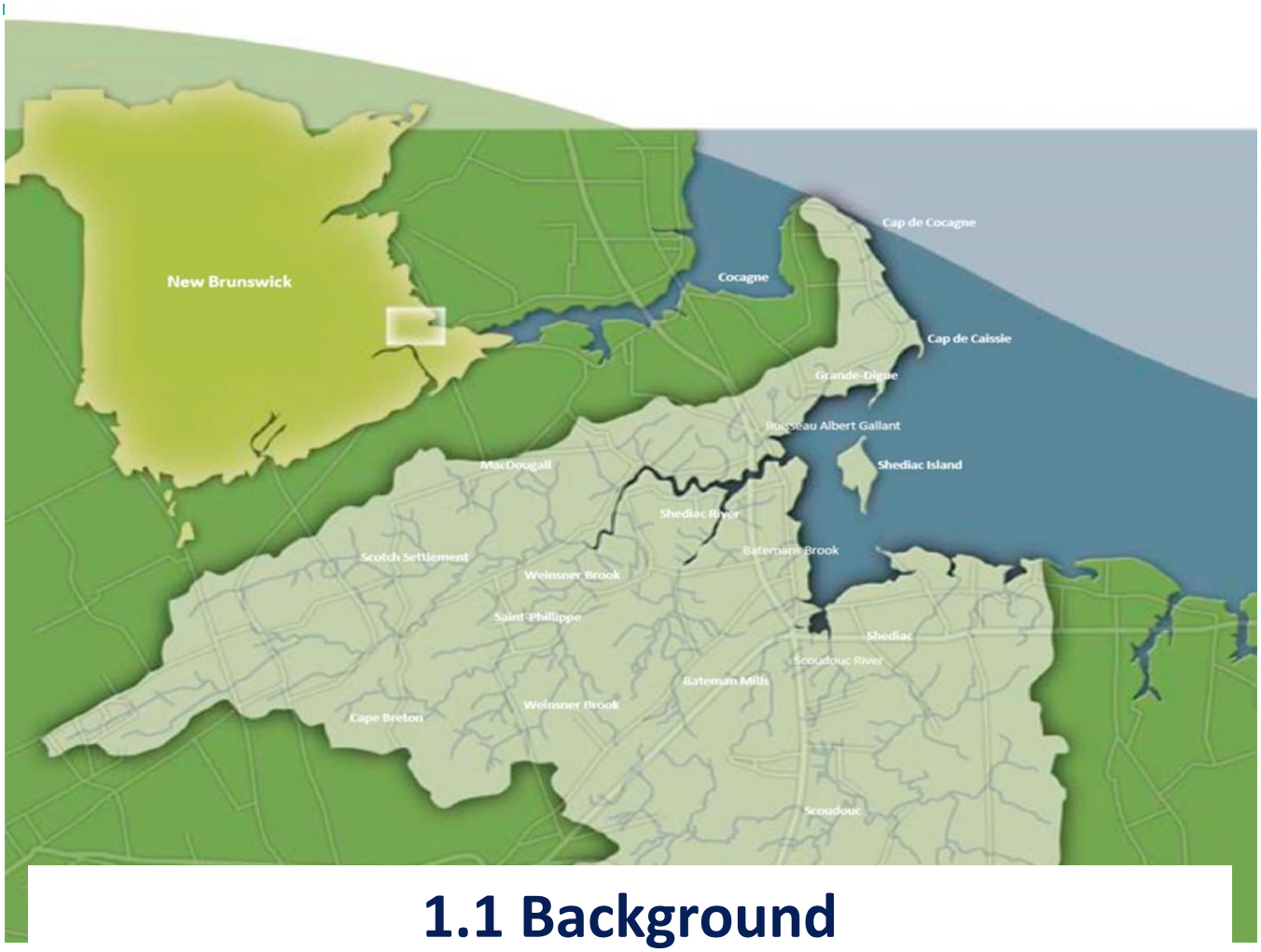
1 Introduction



1.1 Background

Water quality at Parlee Beach has been an area of concern for residents of the Shediac Bay Watershed and for those who enjoy visiting this popular recreational attraction for many years. In 2016, the Government of New Brunswick formed a Steering Committee tasked with gathering information to help gain a better understanding of the source of the water quality concerns.

The results of numerous studies and projects undertaken between 2017 and 2018 were summarized by the Steering Committee in the *Parlee Beach Water Quality Shediac, New Brunswick Final Report*. The report concluded that while water quality at Parlee Beach is very good most of the time, there are water quality issues within the Shediac Bay Watershed that should be addressed. The development of a Shediac Bay Watershed Management Plan was identified as an important step in addressing water quality issues in the watershed. Improving water quality in the watershed (i.e. the freshwaters that drain into Shediac Bay and the nearshore coastal saltwaters) will in turn, help protect and improve water quality at Parlee Beach.

Therefore, the main purpose of this watershed management plan is to identify and address water quality issues in the Shediac Bay Watershed and to nurture our connection and relationship with the land, water, and living beings.

1.2 Integrated Watershed Management

Water is complex to manage. Its dynamic nature does not coincide with institutional, social and political boundaries (Biswas, 2004). Integrated Watershed Management (IWM) is an approach for managing human activities and natural resources, on a watershed basis while taking into consideration the connected interests and needs of the environment, economy and society (Conservation Ontario, 2012). The IWM approach integrates multiple concepts and methods, including water management and land use planning, and evaluates and manages cumulative impacts (i.e. all combined sources of contaminants in a watershed).

The Shediac Bay Watershed Management Plan applies the IWM approach with a focus on water quality, ecosystems and the environment. It will follow a partnership-based approach as it is not regulatory in nature. A plan developed by local partnerships can be very effective and efficient in a non-regulatory environment as it builds a sense of community and ownership. The plan will apply an "Adaptive Management" approach which will allow flexibility to adapt/respond to new or ongoing challenges in the watershed.

Scoudouc River by the Shediac Bay Watershed Association (SBWA)

1.3 The Purpose of this Plan (Vision)

The purpose of this plan is to work together to protect and improve the Shediac Bay Watershed and nurture our connection and relationship with the land, water, and living beings.

1.4 Guiding Principles

The following guiding principles represent the beliefs and values that will guide the development and implementation of the Watershed Management Plan. These principles were inspired by the guiding principles established in the Integrated Watershed Management Plan of the Peace and Slave Watersheds in Alberta.

- **Respect a diversity of peoples and values**
  - By demonstrating individual and collective respect for the air, land, water and living beings, and
  - By appreciating the diversity of values and cultures found in the Shediac Bay Watershed.
- **Be an ambassador**
  - By promoting our vision and mission;
  - By demonstrating integrity, accountability and practicality, and
  - By practicing effective communication, knowledge-building and consensus decision-making.
- **Be a trustworthy and credible source of information**
  - By being well-informed and providing sound advice;
  - By using an integrated watershed management approach that is science-based and locally relevant;
  - By considering the cumulative effects and the impacts of climate change;
  - By taking into consideration adaptive management options, and
  - By using the watershed as the planning boundary.
- **Be open and transparent**
  - By seeking balanced representation, and
  - By listening to all stakeholders.
- **Be inclusive and collaborative**
  - By facilitating inclusive and collaborative processes and partnerships;
  - By promoting membership and interaction, and
  - By providing opportunities for all stakeholders and First Nations to be involved.
- **Be action-oriented and innovative**
  - By being motivated, resourceful and action-oriented in finding new, innovative ideas and win-win strategies, and
  - By working together to implement measures that will protect/improve water quality in the Shediac Bay watershed.
- **Foster stewardship**
  - By encouraging and enabling individuals and organizations to be good stewards of the watershed and the environment.

1.5 The Planning Process

The first step in the development of the Shediac Bay Watershed Management Plan (WMP) was to engage with First Nations, local stakeholders as well as the public to identify key issues and concerns. This was followed by the formation of a Technical Working Group tasked with developing the plan while taking into consideration the feedback received during the engagement process. Figure 1 shows the main steps of the Shediac Bay WMP development process.

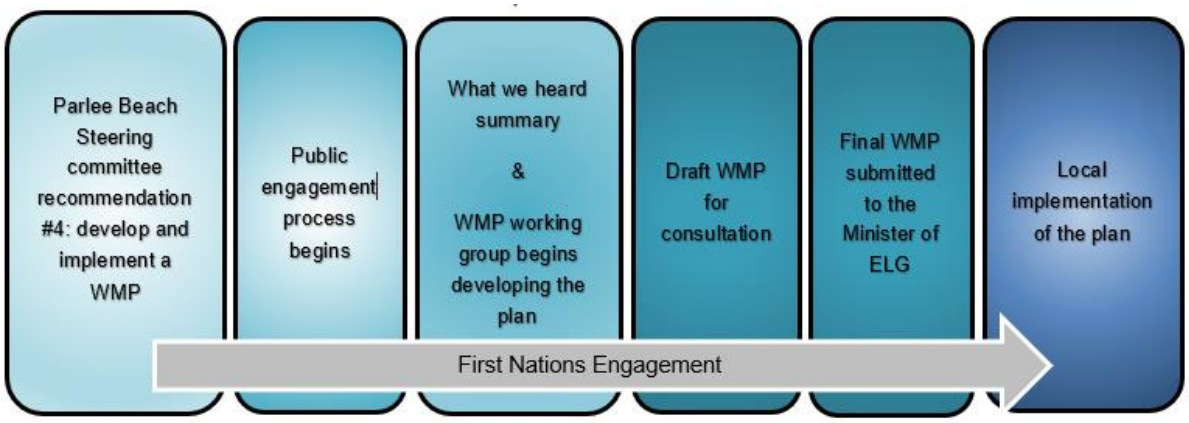
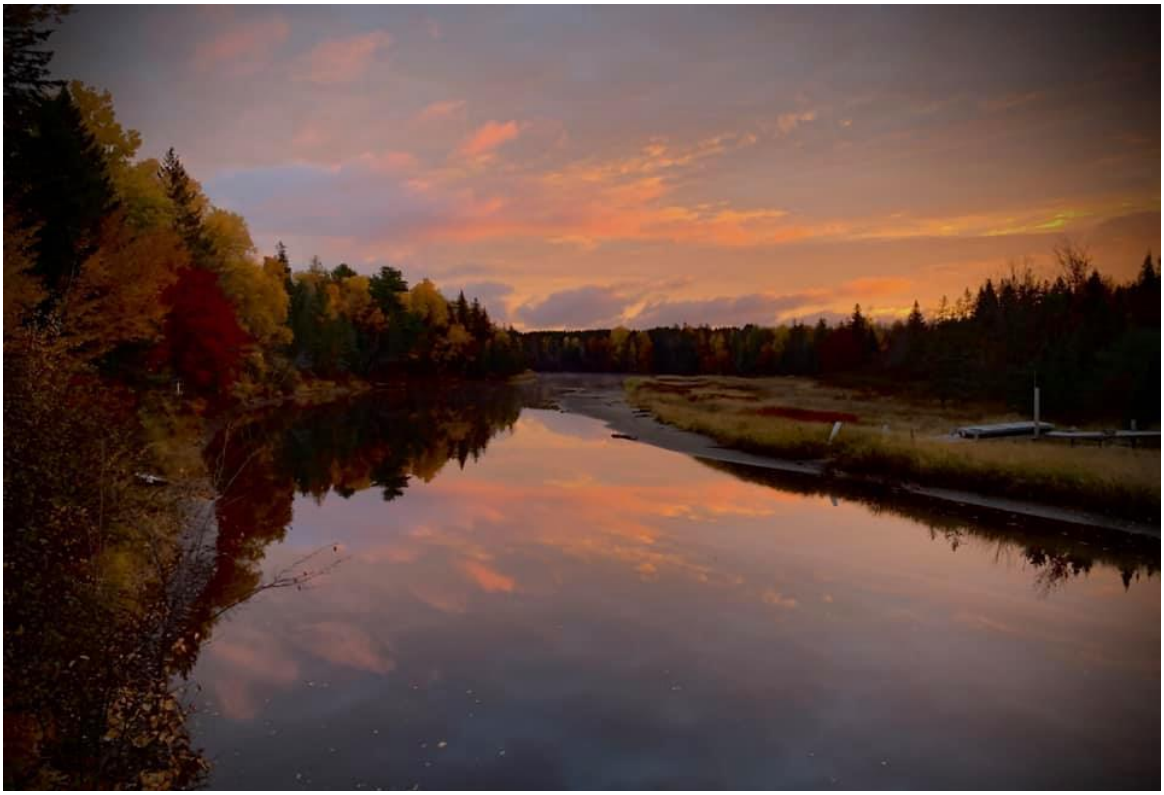


Figure 1: Overview of the Shediac Bay WMP development process



Shediac River at Sunset by David Steeves

2

Characteristics of the Shediac Bay Watershed

2.1 Land Use

The Shediac Bay Watershed represents a surface area of approximately 516 km^2. As shown in Figure 2, the watershed is predominantly (71.90%) forested; agricultural lands represent 9.41% of the watershed area while wetlands represent 7.44% and 7.06% of the area is settled.

The remaining watershed area consists of a mixture of industrial development (1.24%), infrastructure (2.52%), and recreational development (0.40%). Figure 3 represents the locations of the various land uses within the Shediac Bay Watershed boundaries.

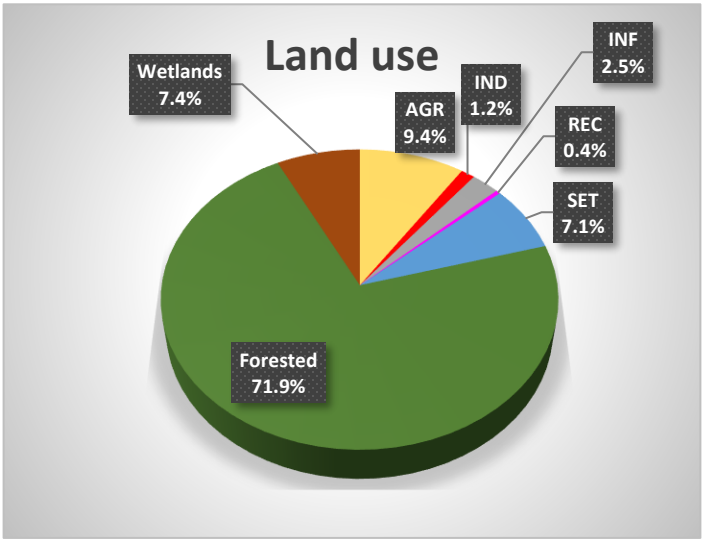


Figure 2: Land use in the Shediac Bay Watershed

Kayaking on the Scoudouc River by Brian Atkinson

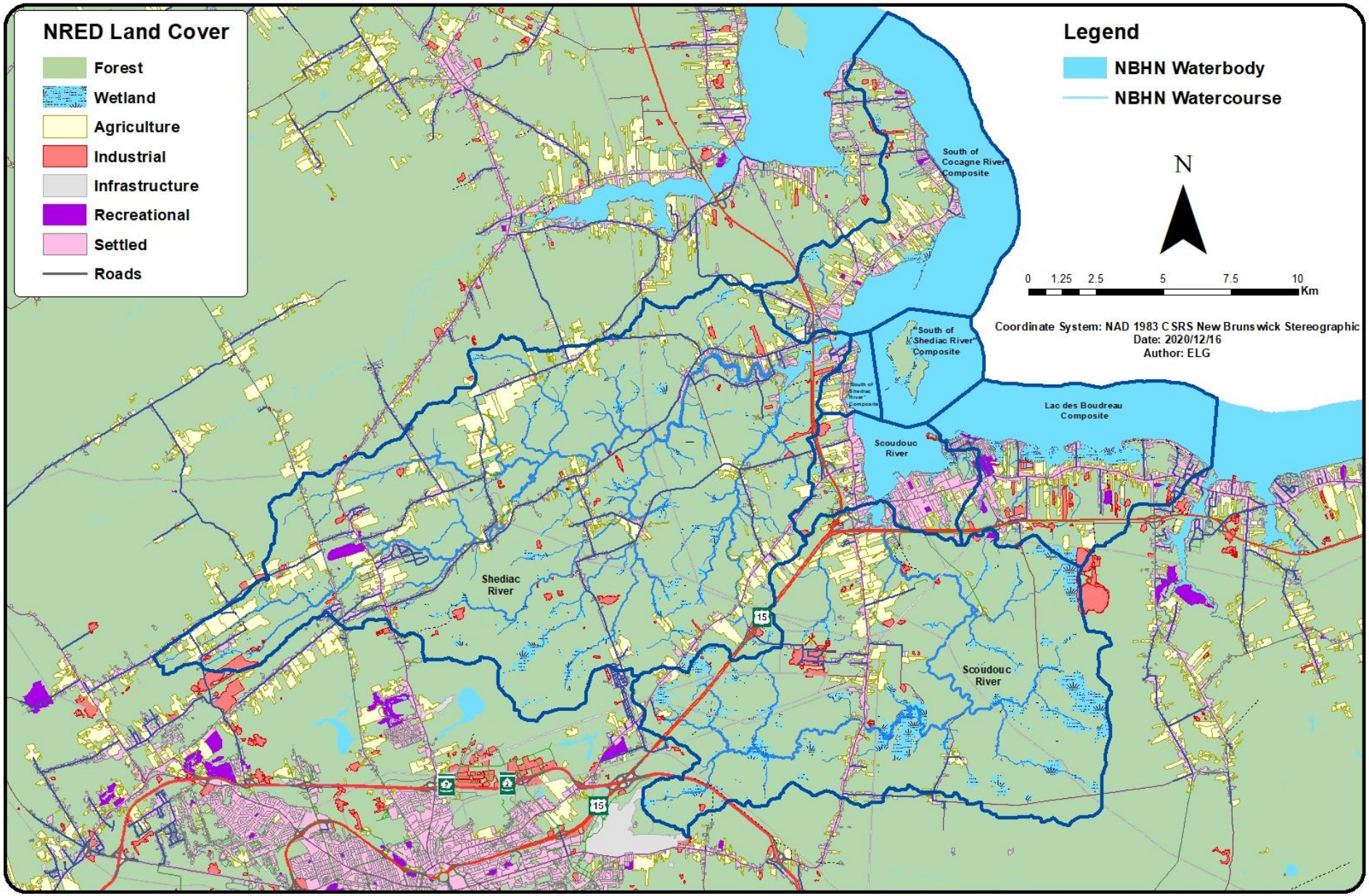


Figure 3: Shediac Bay Watershed land use map

2.2 Natural Environment

The Shediac Bay Watershed is mostly forested with a mixed assemblage of coniferous and deciduous tree species (Rowe 1992). The watershed includes two major river systems: the Shediac River and the Scoudouc River. Each of these drains into Shediac Bay which is part of the Northumberland Strait. There are a few smaller streams not connected to the two major river systems that drain directly into Shediac Bay. Inland and coastal wetlands in the watershed provide important functions such as water purification, protection against flooding and sea level rise, and habitat for many bird, mammal, reptile and amphibian species that are uniquely adapted to wet environments.

Wetland near Grande Digue by the Shediac Bay Watershed Association

The Shediac Bay Watershed is also home to species at risk. Table 1 below provides a summary of provincially and federally listed species at risk that occur in or near the Shediac Bay Watershed.

Table 1: Federally and Provincially Listed Species at Risk in the Shediac Bay Watershed

List of Species at Risk	Provincial Listing	Federal Listing
Bald Eagle	Endangered	Not at Risk
Barn Swallow	Threatened	Threatened
Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern
Bicknell's Thrush	Threatened	Threatened
Bobolink	Threatened	Threatened
Brook Floater Mussel	Special concern	Special Concern
Canada Warbler	Threatened	Threatened
Common Nighthawk	Threatened	Threatened
Eastern Meadowlark	Threatened	Threatened
Eastern Wood-Pewee	Special Concern	Special Concern
Horned Grebe	Special Concern	Not listed
Monarch butterfly	Special Concern	Special Concern
Olive-sided Flycatcher	Threatened	Threatened
Peregrine Falcon	Endangered	Special Concern
Piping Plover melodus ssp	Endangered	Endangered
Red Knot rufa ssp	Endangered	Endangered
Southern Twayblade	Endangered	Not listed
Wood Thrush	Threatened	Threatened
Wood Turtle	Threatened	Threatened

A January 2020 search of the Atlantic Canada Conservation Data Center (AC CDC) noted the presence of three bird species currently listed as threatened under the *Federal Species at Risk Act* as well as by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (i.e. Barn Swallow, Canada Warbler, and Olive-Sided Flycatcher). In addition, the Southern Twayblade, a rare bog orchid that lives only a few weeks each year is currently listed as endangered under the *New Brunswick Species at Risk Act* and has been documented in the Scoudouc River sub-basin. Furthermore, according to the AC CDC, sightings of the Piping Plover, which is currently listed as endangered under the federal *Species at Risk Act*, have been reported along the coast of this watershed up until at least 2013.

Barn Swallow by the Island Nature Trust

Southern Twayblade by Allan Cressler

Olive-sided Flycatcher by the Species at Risk Public Registry

Agricultural lands are scattered throughout the rural portions of the watershed. Farming is essential in maintaining a local food supply; however, it can impact water quality in a watershed. It is essential that watershed partners help farmers find the guidance and support they need to continue making their living and providing this essential service while mitigating impacts as much as possible.

Canada Warbler by the Species at Risk Public Registry

2.3 Socio-Economic Environment

The Shediac Bay Watershed has a population of approximately 16,000 full-time residents resulting in an average population density of about 31 people per km^2. The population is not evenly distributed within the watershed. There are five incorporated areas (Shediac, Cocagne, Beaubassin Est, Dieppe, and Moncton), and nine local service districts (Dundas, Grand Digue, Moncton, Pointe-du-Chêne, Scoudouc, Scoudouc Road, Shediac, Shediac Cape, and Shediac River-Shediac Bridge) in or in some cases, partially within the Shediac Bay Watershed (Figure 4). The Town of Shediac is the most densely populated area with a density of approximately 124 people per km^2 outside of the peak tourist season. It is currently the fastest growing municipality in New Brunswick. Table 2 represents the population growth of the Town of Shediac in recent years. Parlee Beach Provincial Park is also located within the watershed and is a major economic driver for the region. It draws hundreds of thousands of tourists each year who stay at the numerous campgrounds and hotels and help local businesses prosper.

Year	Population	Growth
1996	4,664	+7.4%
2001	4,892	+4.9%
2006	5,497	+12.4%
2011	6,053	+12.4%
2016	6,664	+10.1%

Table 2: Town of Shediac population growth (1996-2016)

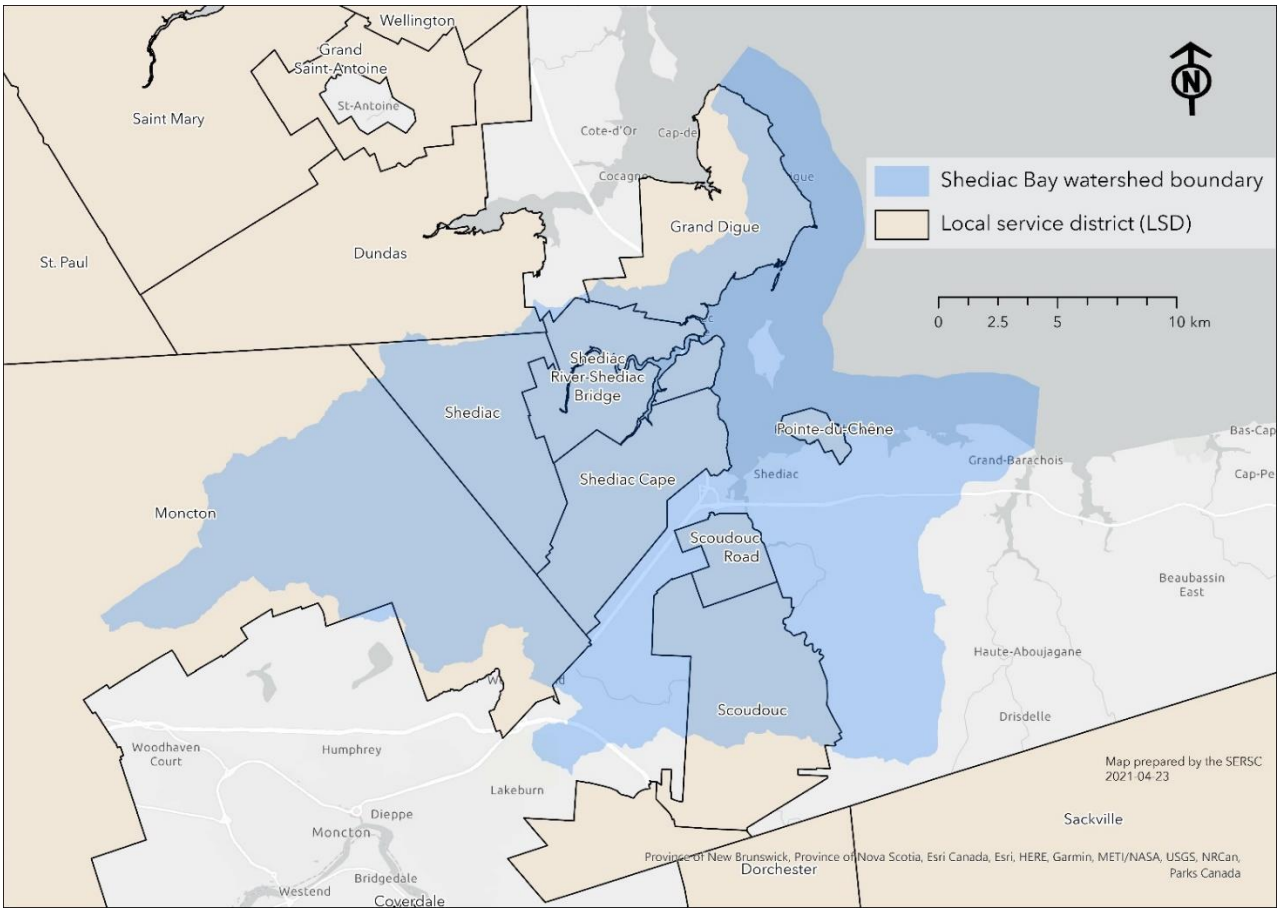


Figure 4: Local Service District boundaries in the Shediac Bay Watershed

The Town of Shediac's drinking water source is groundwater extracted from 7 active water wells. Watershed residents that reside outside of the serviced area obtain their drinking water from privately-owned water wells. Figure 5 shows the location of the Town's wellfield protected areas.

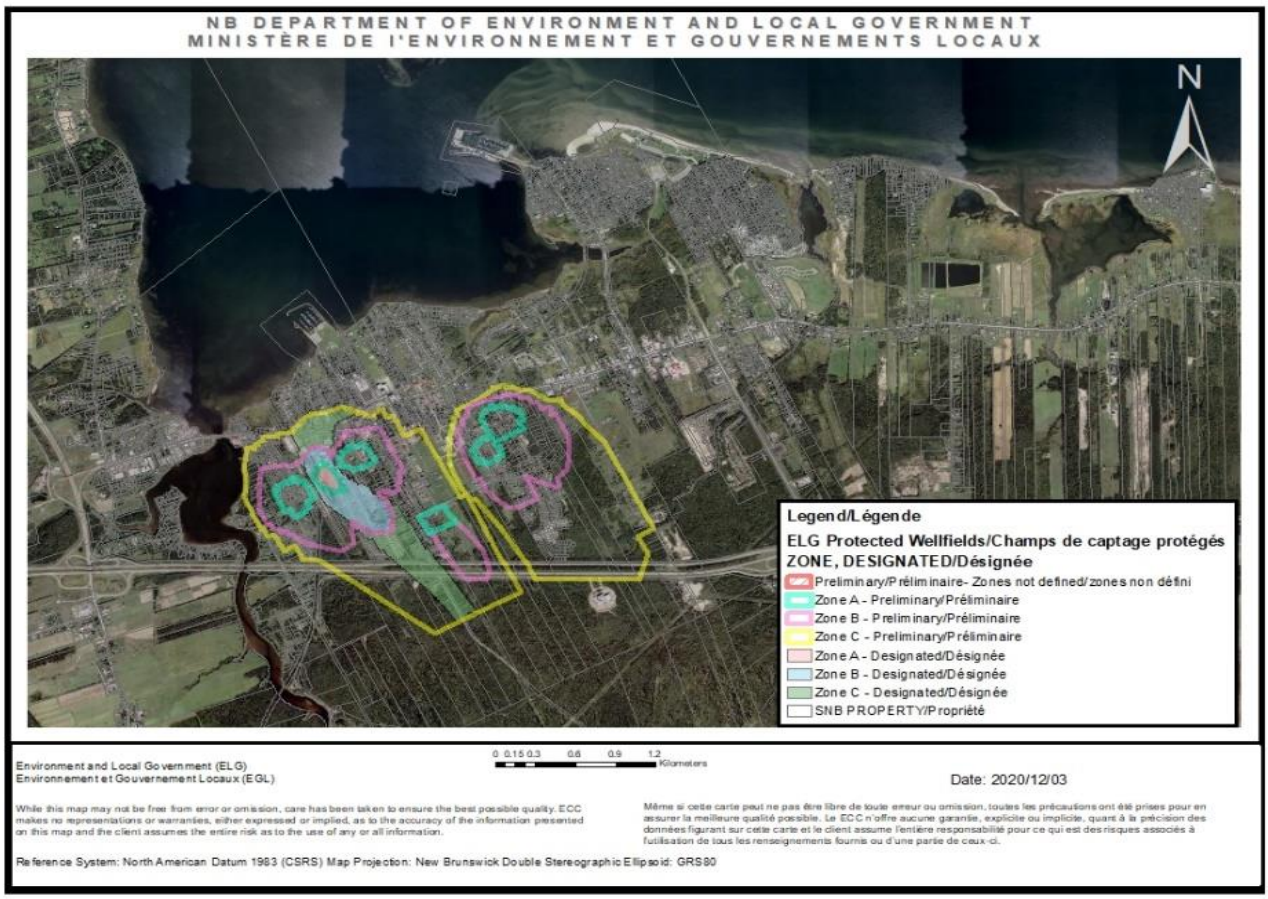


Figure 5: Town of Shediac wellfield protected areas

Wastewater services are provided by the Greater Shediac Sewerage Commission (GSSC) in the serviced areas of the watershed. The GSSC services extend beyond the municipal limits of the Town of Shediac however, it does not cover the entire watershed area. Sewage in the un-serviced areas is managed with the use of on-site septic systems. Some people living along the coast have raised concerns regarding homes/cottages that were built on historic, small sub-standard building lots that do not meet current standards for accommodating a typical on-site septic system. Figure 6 shows the area serviced by the GSSC as well as the un-serviced areas that have been the subject of past studies.

The watershed spans three distinct planning authorities namely, the South East Regional Service Commission, the Kent Regional Service Commission and two independent planning departments (i.e. City of Moncton and City of Dieppe). Figure 7 shows the location of the watershed in relation to these planning regions. Developing partnerships with all applicable planning authorities will be essential in ensuring the long-term success of this Watershed Management Plan.

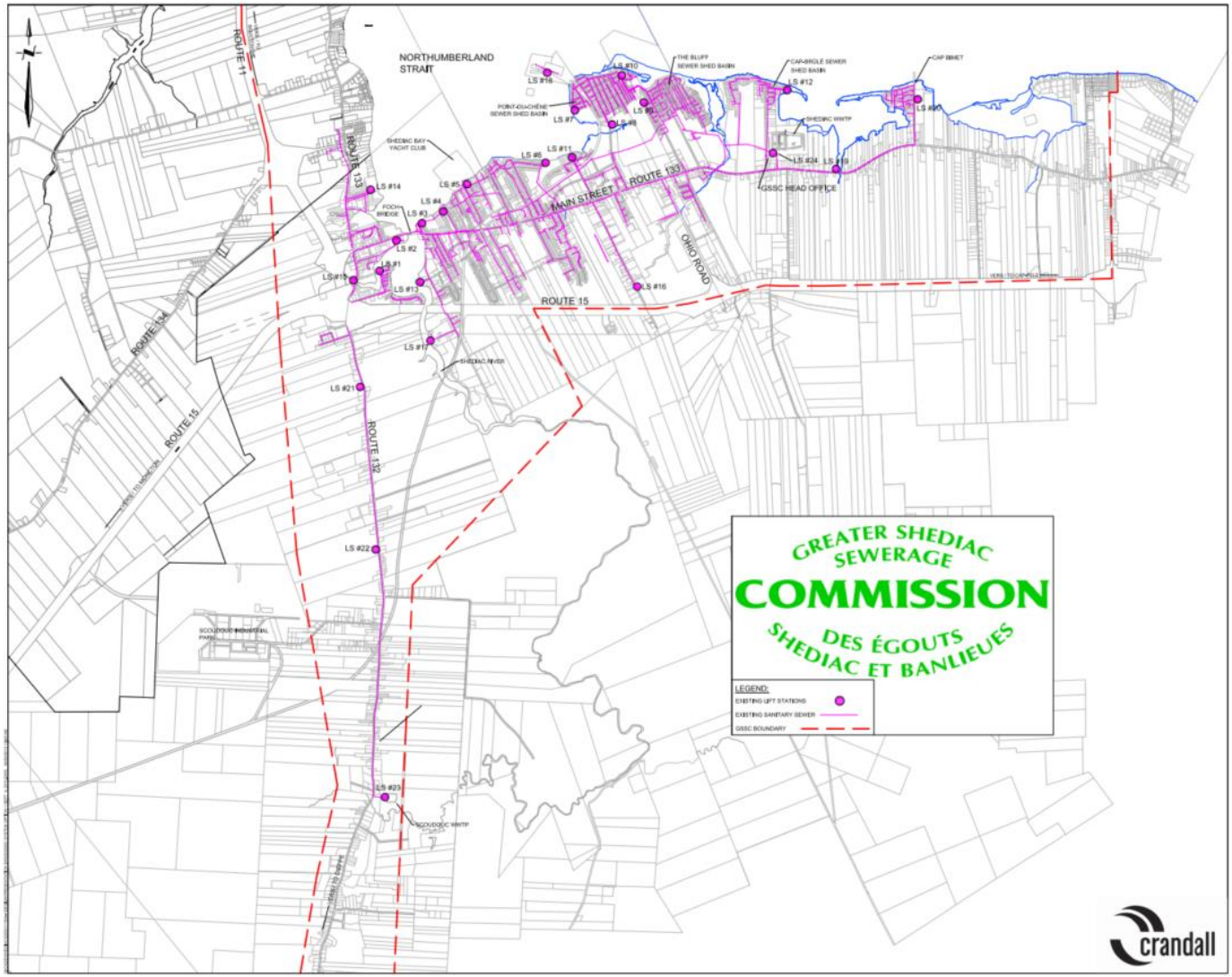


Figure 6: Area serviced by the GSSC (pink lines represent the location of the GSSC sewer lines and the pink dots represent the locations of the GSSC lift stations)

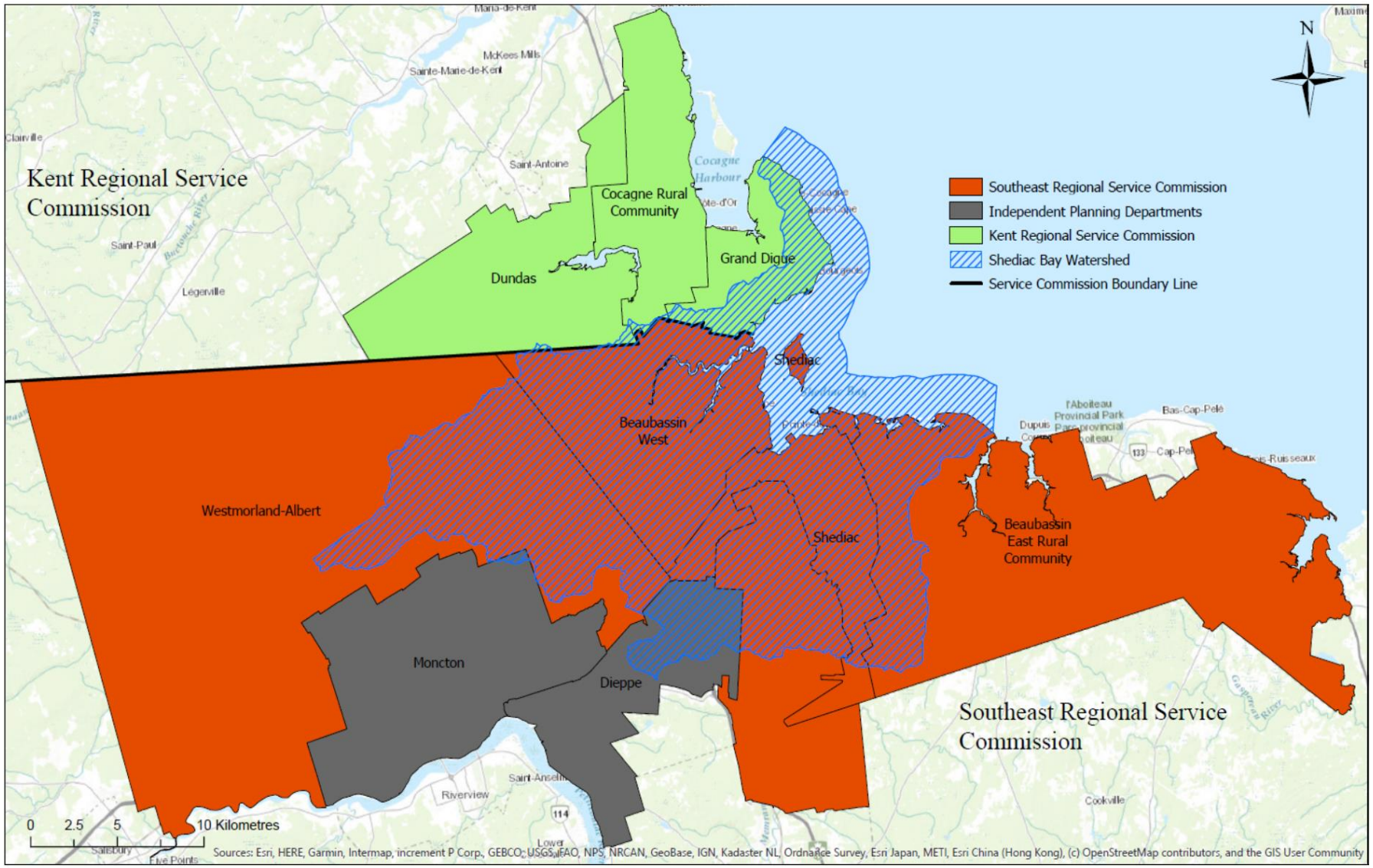


Figure 7: Planning regions within the Shediac Bay Watershed

2.4 Climate Change

Although climate change is a global issue, projections indicate the effects on climate in Canada will be greater than much of the rest of the world. Temperatures here are expected to rise two times faster than the global average. In northern Canada, this rise is expected to be three times faster. New Brunswick is already experiencing higher temperatures, greater precipitation intensities and increasing sea levels (Bush and Lemmen, 2019). This along with reduced sea ice cover, will increase the risk of coastal flooding and erosion (Daigle, 2020). According to *New Brunswick's Climate Change Action Plan* (2016), our province can also expect: an elevated risk of heat-related health concerns; new pests and invasive species; flood damage; impacts from extreme winds, and icing of trees and power lines.

Average annual temperatures in New Brunswick have already increased by 1.5 °C over the past century, with most of this warming (i.e. 1.1 °C) taking place over the last 30 years (Government of New Brunswick, n.d.). Temperatures have increased in all parts of the province. Climate models predict that by 2100, New Brunswick's average temperatures will increase by 5 °C. Figure 8 shows the current and projected annual mean temperatures in New Brunswick (Roy and Huard, 2016).

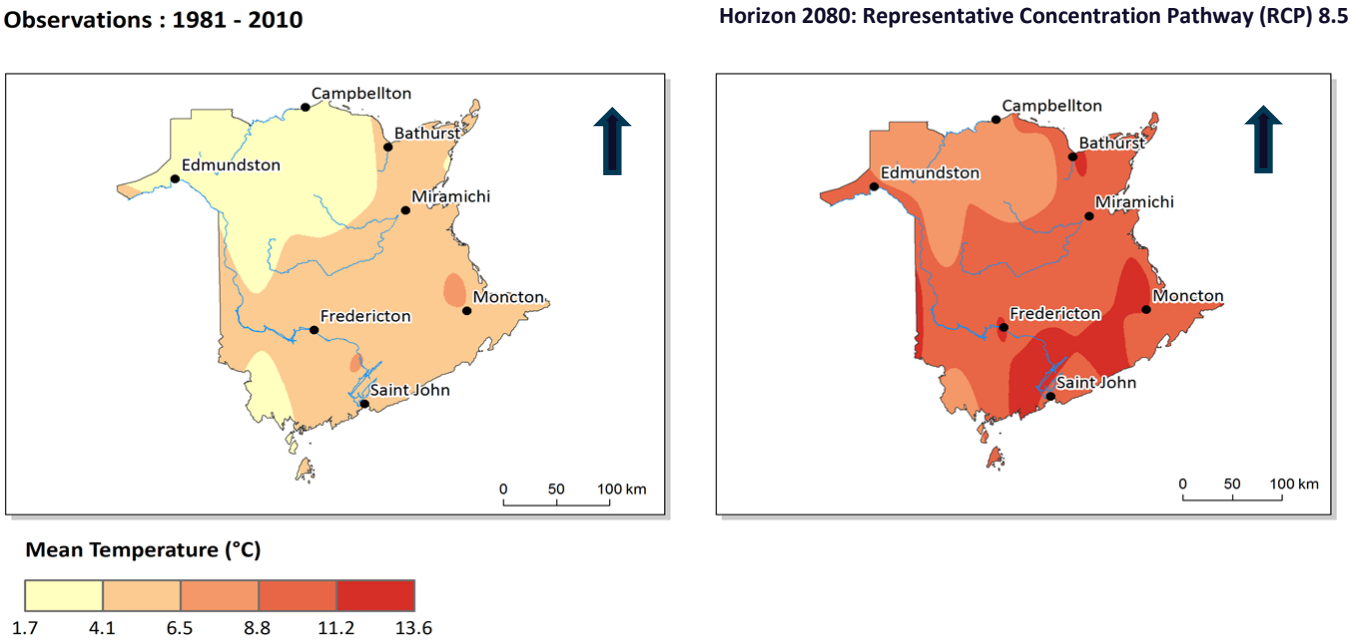


Figure 8: Current (1981-2010) and projected (2080) annual mean temperatures in New Brunswick

It is also anticipated that climate change will result in an increase of 150 mm in the average total annual precipitation (Figure 9) in the Shediac Bay Watershed (Roy and Huard,2016). However, it is projected that the number of annual rain days will decrease; therefore, the overall increase in the total precipitation is likely to occur through higher intensity rain events.

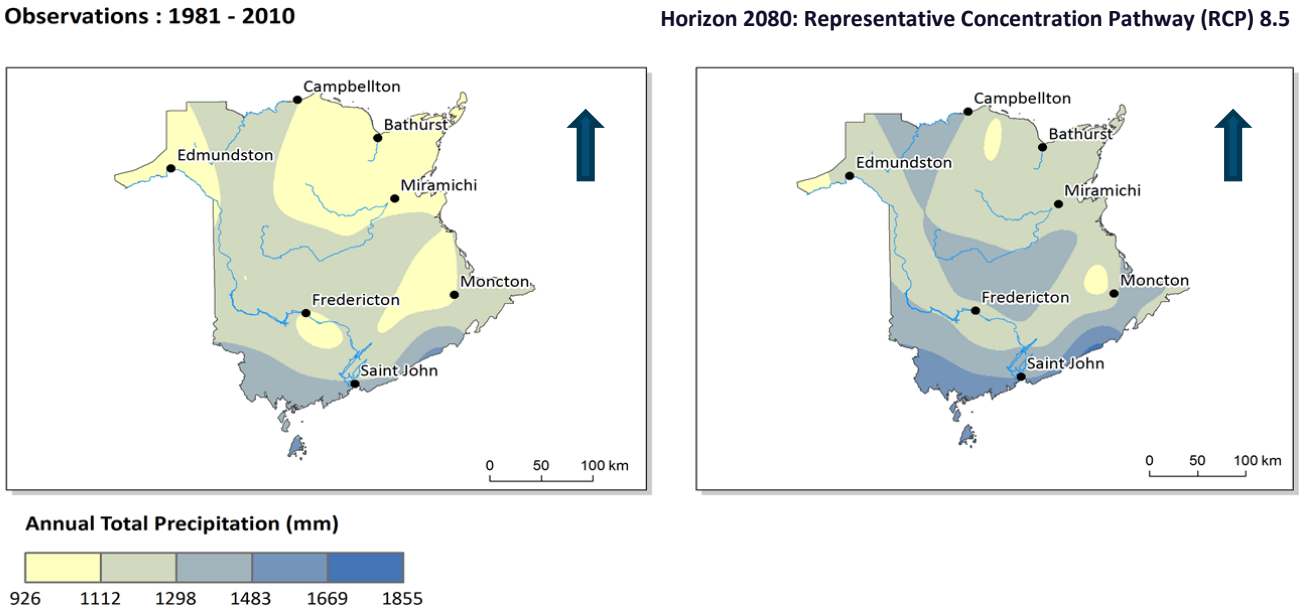


Figure 9: Current (1981-2010) and projected (2080) annual total precipitation (mm) in New Brunswick

In short, it is likely that warmer weather, higher intensity rainfall, combined with rising sea levels, will negatively affect water quality in the Shediac Bay Watershed (i.e. warmer water temperature, increased runoff and sedimentation could in turn increase nutrients and bacteria in the watershed). Improved stormwater and nutrient management; maintenance and enhancement of riparian zones and buffer zones; as well as wetland preservation, will become more important than ever in minimizing the potential impacts of climate change on surface water quality in the Shediac Bay Watershed.

August 10, 2019 heavy rain event by Town of Shediac

December 21, 2010 storm by the South East Regional Service Commission

2.5 Water Quality in the Shediac Bay Watershed

The Shediac Bay Watershed Association (SBWA) has been monitoring surface water quality throughout the watershed since the early 2000's to study long-term trends in water quality.

In 2016, in response to growing water quality concerns at Parlee Beach, the Government of New Brunswick formed a Steering Committee tasked with, among other things, developing an enhanced watershed monitoring program to help gain a better understanding of the potential sources of bacteria in the watershed and at Parlee Beach. The enhanced watershed monitoring program commenced in 2017 and continued from 2018 to 2020. This program was largely carried out following rain events exceeding 10 mm within a 24-hour period. Meanwhile, the SBWA long-term monitoring program was conducted during periods of dry weather (i.e. no rain events, ambient conditions). The sampling sites (Figure 15) are classified in several categories (e.g. agricultural, freshwater, stormwater, effluent, marine, and sediments) based on their location. Detailed water quality reports related to the results of the enhanced water quality monitoring programs can be accessed on both the Government of New Brunswick Website and the SBWA Website.

The following section provides an overview of current surface water quality in the watershed based on the analysis of freshwater samples collected at ten (10) long-term monitoring sites from 2018 to 2020. These sites (Figure 10) were selected based on their representation of the watershed and their accessibility. Four of the sites are located in the Scoudouc River sub-watershed while six of the sites are located in the Shediac River sub-watershed.

Water quality data was assessed by applying the Canadian Council of Ministers of the Environment (CCME) Water Quality Index (WQI) to the data. The WQI is a tool that allows water to be classified into different categories by comparing the data of various parameters (Table 3) to the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 2014). The index is a number between 0 and 100, with zero representing poor water quality and 100 representing excellent water quality (CCME, 2017). The categories for the index are as follows:

Excellent: 95.0 – 100 **Good:** 80.0 - 94.9 **Fair:** 65.0 - 79.9

Marginal: 45.0 - 64.9 **Poor:** 0 - 44.9

Metals/metalloids	Nutrients	Major Ions	General Chemistry
Arsenic	Total Ammonia	Chloride	Dissolved Oxygen
Copper	Nitrate		pH
Iron	Total Phosphorus		Turbidity
Zinc			

Table 3: List of parameters included in the WQI calculation

Figure 10 represents the calculated WQI based on the latest data from 2018 - 2020 at the long-term freshwater monitoring sites in the Shediac Bay Watershed. All sites along the Scoudouc River were in the "fair" category (65.0 - 79.9) except for Scoudouc F which was in the "marginal" category (45.0 - 64.9). In the Shediac River, three out of six sites (Shediac A, Shediac C and Shediac G) were in the "good" category (80.0 - 94.9) while the remaining sites were in the "fair" category (65.0 - 79.9). It should be noted that monitoring sites that fall in the "marginal" category often fail to meet water quality guidelines and/or fail by a considerable margin while monitoring sites that fall in the "fair" category occasionally fail to meet water quality guidelines and do so by a wide margin. Furthermore, monitoring sites in the "good" category rarely fail to exceed water quality guidelines, and if they do, it is usually by a narrow margin.

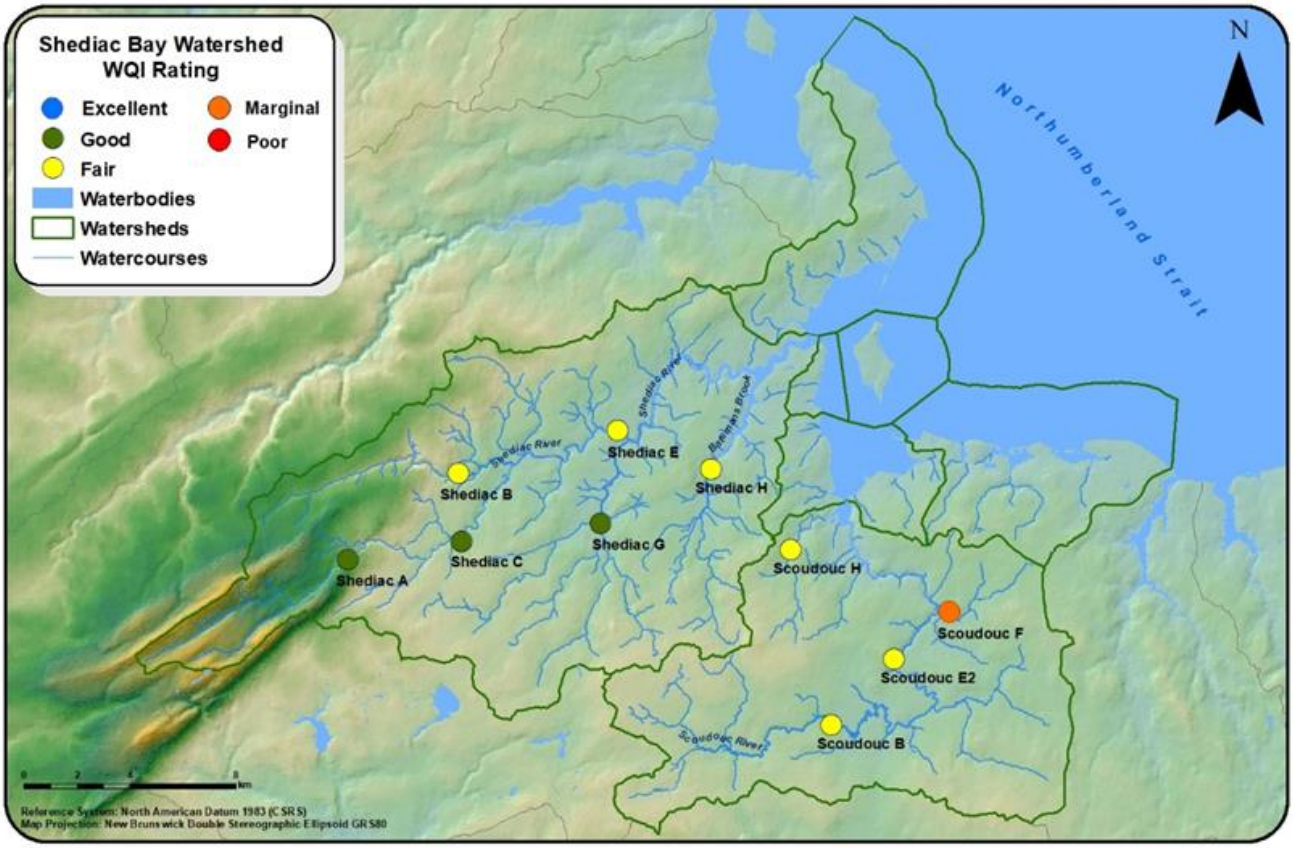


Figure 10: Shediac Bay Watershed Water Quality Index Rating

The parameters driving these results (i.e. parameters that most often did not meet their guideline), were iron and total phosphorus, followed by dissolved oxygen, turbidity and zinc (Figure 11). It is common to have elevated iron concentrations in New Brunswick which can occur naturally because of geological influence.

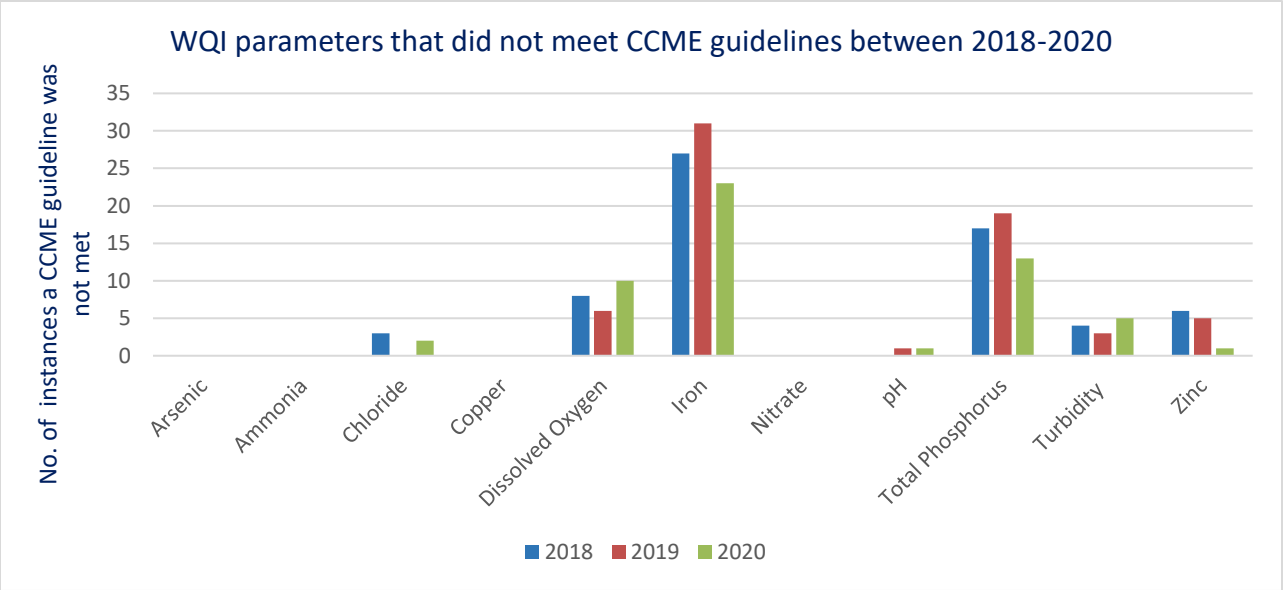


Figure 11: WQI parameters that did not meet CCME guidelines between 2018-2020

In addition to using the CCME WQI, five key indicators of water quality were evaluated against available guidelines. *E. coli* results were compared using the *Guidelines for Canadian Recreational Water Quality (Health Canada, 2012)* which has an *E. coli* single-sample maximum concentration of 400 MPN/100mL. Total phosphorus was compared against an Ontario provincial objective of 0.03 mg/L, since there are currently no guidelines for this parameter in New Brunswick (OMOE, 1994). Furthermore, total nitrogen was compared to the recommended value of 0.7 mg/L to prevent eutrophication in streams and rivers (Dodds et al 1998). The remaining indicators (i.e. dissolved oxygen and pH) were compared to the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life.*

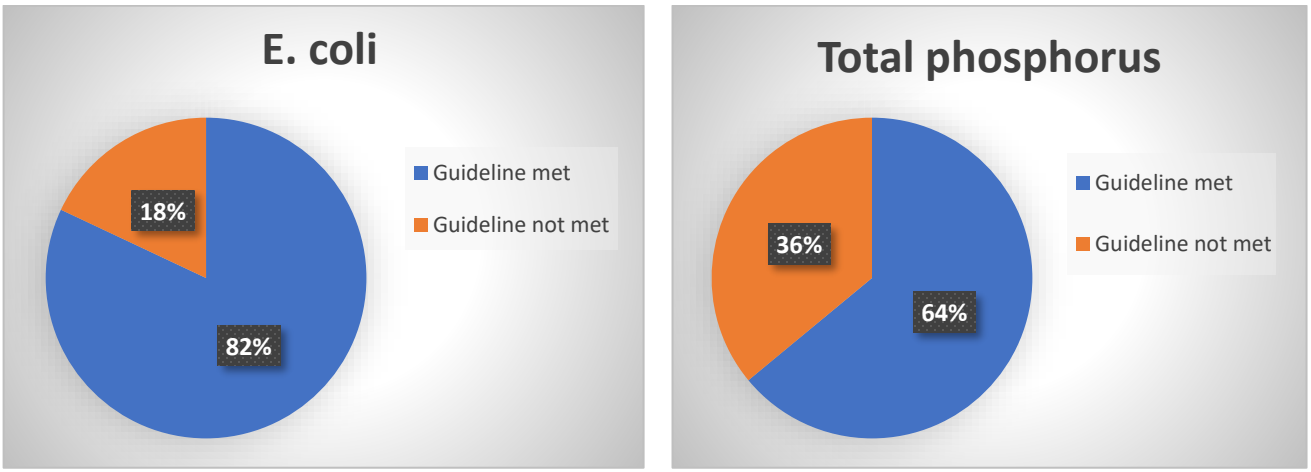


Figure 12: Percentage of *E. coli* and total phosphorus samples that met their respective guideline

E. coli concentrations met the guideline (<400 MPN/100 mL) 82% of the time and total phosphorus (<0.03 mg/L), 64% of the time. Sedimentation (i.e. surface runoff and erosion) in the watershed could be contributing to the total phosphorus and *E. coli* concentrations.

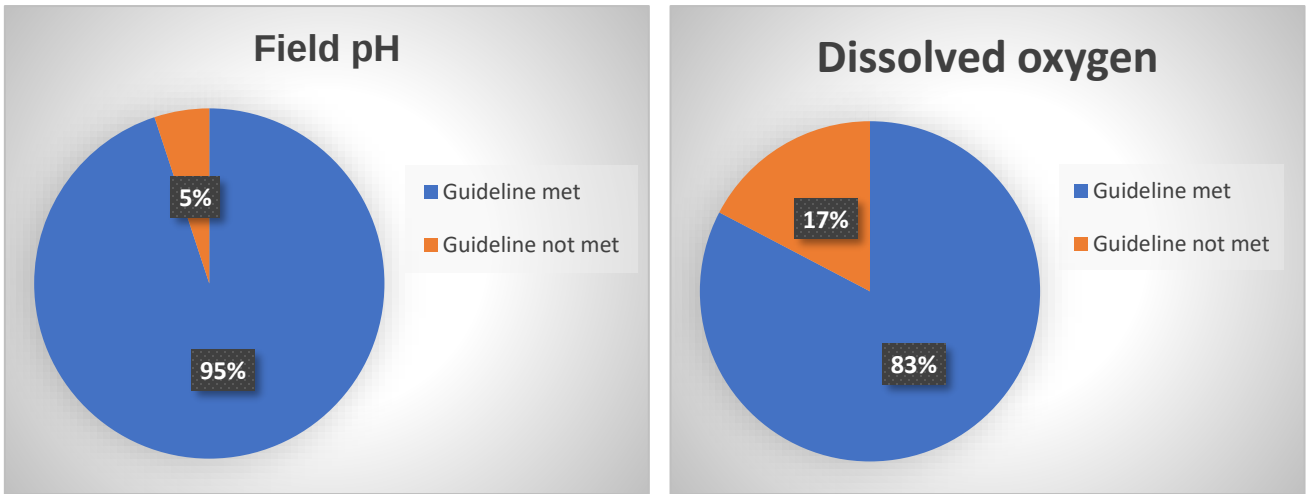
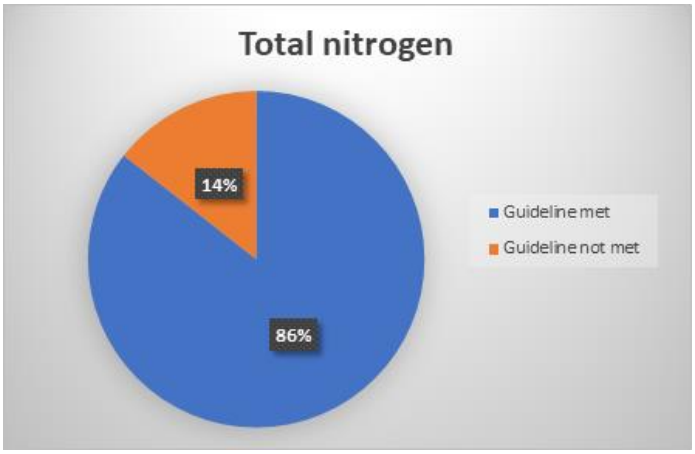


Figure 13: Percentage of pH and dissolved oxygen samples that met their respective guideline

The pH concentration in the Shediac Bay Watershed was good and met the guideline (>6.5 and <9.0) 95% of the time while the dissolved oxygen guideline (>6.5 mg/L) was met 83% of the time. Excessive growth of plants/algae due to an abundance of total phosphorus could have an influence on dissolved oxygen levels in surface water. As plants and algae die-off, they use up oxygen as part of the decomposition process. Increases in the temperature of surface water can also decrease the dissolved oxygen concentrations in a waterbody. Therefore, addressing sources of excess total phosphorus and maintaining buffer zones around watercourses could help increase oxygen levels.



Total nitrogen met its guideline of 0.7 mg/L, 86% of the time. Both total phosphorus and total nitrogen could be indicative of surface runoff in the watershed.

Figure 14: Percentage of total nitrogen samples that met the guideline

Overall, water quality within the Shediac Bay Watershed is good. However, like many other watersheds in New Brunswick, there are areas within the watershed where sediment laden runoff is likely causing exceedances in some water quality parameters. Implementing the actions outlined in this Watershed Management Plan will help address these issues and improve water quality in the watershed over time.

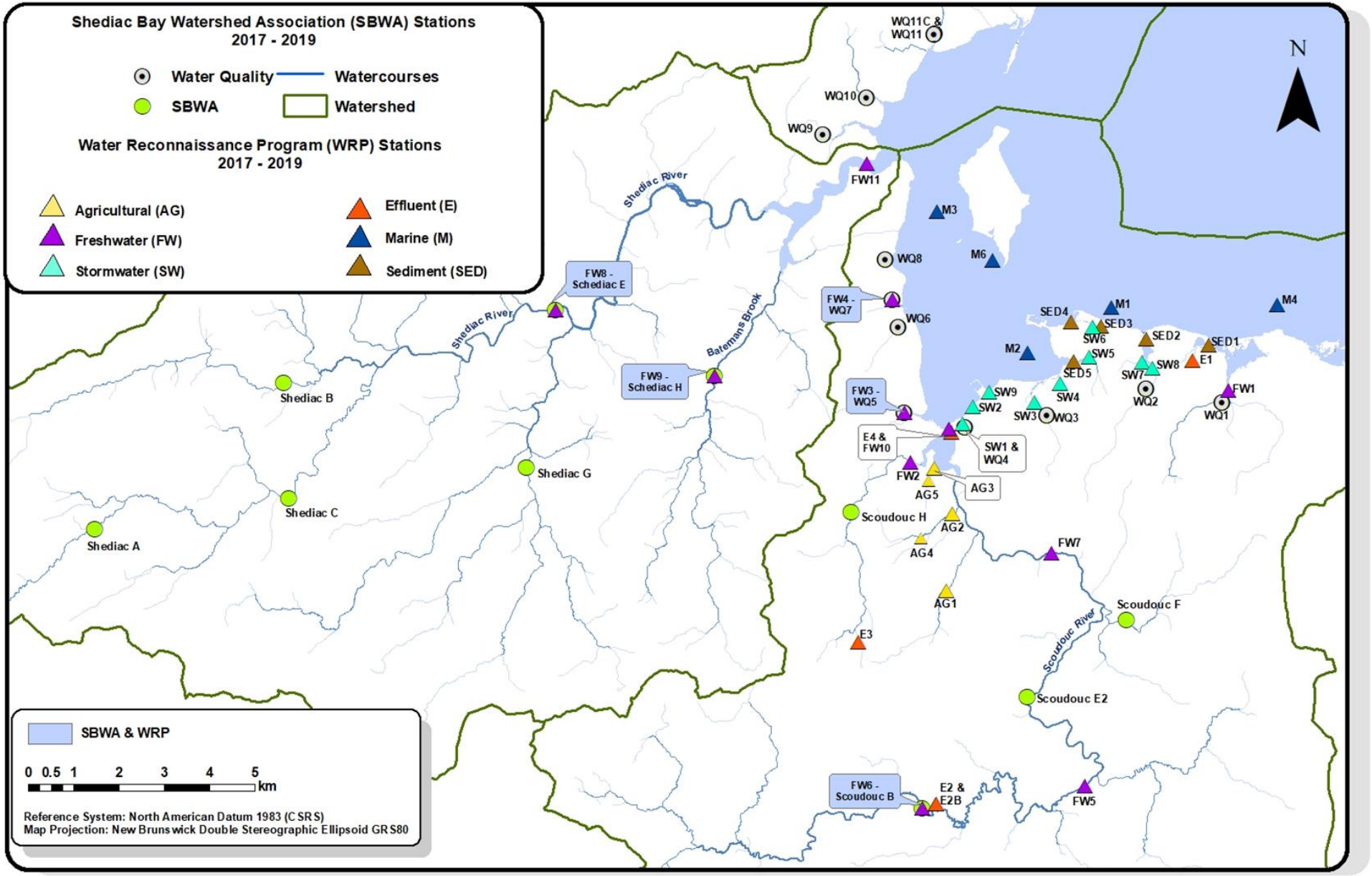


Figure 15: Water quality monitoring locations and perceived influences within the Shediac Bay Watershed

2.6 Water Quality at Parlee Beach

Parlee Beach is a provincial park beach located in the coastal portion of the Shediac Bay Watershed. One of North America's finest beaches, Parlee boasts the warmest salt water in Canada and has been awarded the Blue Flag international eco-certification. The Government of New Brunswick has adopted a Water Monitoring Protocol for Provincial Park Beaches that provides evidence of overall water quality and helps inform decisions as to whether the water is likely suitable for swimming. Based on water quality results collected at Parlee Beach to date, it has been determined that there is no chronic water quality issue and water quality is suitable for swimming most of the time.

The *2019 Parlee Beach and Shediac Bay Watershed Water Quality Results* report summarises recreational water quality monitoring data for the 2017, 2018 and 2019 swimming seasons. During the 2019 beach water quality monitoring season, samples were collected for one hundred and seven (107) days, resulting in 1,070 samples (one sample each for *E. coli* and enterococcus at each of the five stations along the beach). In total 97.3% of all samples met the *Guidelines for Canadian Recreational Water Quality*. During 2018, there were 136 sampling days and 1,360 samples, of which 98.2% met the guideline values. In 2017, 1,452 samples were collected, of which 98.6% met the guideline values (Paynter, 2020).

Children playing at Parlee Beach, by Brian Atkinson

The occasional exceedance of a guideline value has been temporary, with water quality quickly returning to normal levels. More information about the provincial recreational beach water quality monitoring program and the most up-to-date water quality data can be viewed at: beaches.gnb.ca.

Following a series of projects and studies undertaken in 2017-2018 to better understand water quality at Parlee Beach, the Steering Committee for Water Quality at Parlee Beach's Final Report concluded that the occasional exceedance of guideline values are likely a result of bacteria originating from within the Shediac Bay Watershed making their way to Parlee Beach during a combination of meteorological and oceanographic conditions. It was recommended that to protect water quality at Parlee Beach, the bacteria sources which exist throughout the watershed should be addressed.

Since the Shediac Bay Watershed drains into Shediac Bay near Parlee Beach (Figure 16), it is important to understand that **everyone in the Shediac Bay Watershed has a role in protecting the environment and water quality at Parlee Beach**.

To learn more about how you can help make a difference and get involved in the implementation of the Shediac Bay Watershed Management Plan, please contact the Shediac Bay Watershed Association.

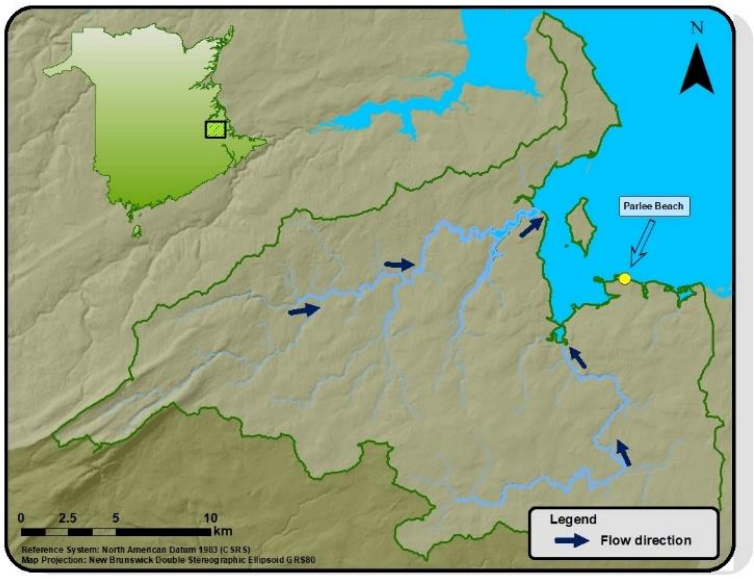


Figure 16: Location of Parlee Beach in relation to the Shediac Bay Watershed

To help keep Parlee Beach and the environment clean, please always remember to:

- Dispose of garbage at appropriate locations.
- Dispose of waste from pleasure boats at appropriate facilities.
- Collect dog waste. Domestic animal waste can be a source of pollution.
- Keep up with regular maintenance of on-site septic systems.
- Empty septic systems of recreational vehicles at appropriate locations and not directly into the ground.

Reporting concerns related to the environment or water quality

Concerns related to the environment and/or water quality can be reported one of two ways:

- For non-emergencies, please contact the Department of Environment and Local Government's Moncton Regional Office at (506) 856-2374.
- For emergencies (including petroleum or other types of spills), please contact the Coast Guard's 24-hour hotline at 1-800-565-1633.

Together, all residents of the Shediac Bay Watershed can help protect Parlee Beach water quality.

Parlee Beach by Michel Mallet

3

Issues, Goals and Actions

3.0 Issues, Goals and Actions

In October 2019, the Department of Environment and Local Government (DELG) initiated a public, First Nation and stakeholder engagement program to identify issues and concerns and help inform the development of a Shediac Bay Watershed Management Plan. A technical workshop took place on the afternoon of October 17th, 2019. The workshop was followed by an open house in the evening. Both events took place in the Town of Shediac and nearly 100 stakeholders were invited. Two questionnaires were developed; one for use at the stakeholder workshop, and the other was available to fill out at the open house. The questionnaire was posted on DELG's website for the month of October 2019. Throughout the engagement process, the primary issues raised by participants included concerns related to the **impacts of stormwater** on water quality and quantity in the Shediac Bay Watershed; the **impacts of agricultural activities** on water quality, the **Greater Shediac Sewerage Commission's lift stations**, some of which periodically overflow during heavy rain events, inadequate **on-site septic systems** in the un-serviced areas of the watershed, **land development in ecologically sensitive areas**, the protection of **wetlands** and **riparian zones**, and **water quality at Parlee Beach** which can be affected by **water quality in the watershed**. Further information on the results of the early engagement program can be accessed here.

Respondents suggested the Watershed Management Plan should identify issues that need to be addressed and propose goals and actions to address these issues. It was further suggested that best management practices should be developed to improve agricultural practices in the watershed, and new regulations or development plans should also be created to limit development in environmentally sensitive areas. Finally, it was suggested that the Watershed Management Plan should clearly define roles and responsibilities, and reliable funding should be made available to help the community address the issues. A second round of engagement was undertaken in 2020 where First Nations and stakeholders were given another opportunity to provide feedback.

The draft Shediac Bay Watershed Management Plan was posted online on February 4th, 2021. This marked the beginning of a final round of engagement. Written notifications were sent to stakeholders, newsletters were sent to the First Nation Communities of Fort Folly, Indian Island and Buctouche and a virtual meeting was held on February 18th, 2021. Written comments were accepted until March 5th, 2021. The feedback received during the final round of engagement was used to improve and finalize the draft plan.

First Nation involvement:

The participation of Mi'gmawe'l Tplu'taqnn Inc. and the First Nation Communities of Fort Folly, Buctouche and Indian Island was an integral component of the development of the Shediac Bay Watershed Management Plan. The following issues were brought forward by First Nations during the engagement process.

"*Love of money and ignorance will contaminate clear drinking water. Contaminated water will eventually eliminate life on reserves as we know it. Clear water gives life to everyone regardless of race, color or creed. So, we must protect our drinking water at all costs*". Vince Barlow, Mi'gmawe'l Tplu'taqnn Inc. (MTI) Elder.

Clean air and clean water are of great importance to First Nations. On March 11, 2020, a community engagement meeting was held at Indian Island First Nation where a presentation was given to a group of elders. Concern was expressed around the potential impact of poor water quality on the use of traditional medicinal plants such muskrat root which grows along slow-moving rivers or streams and in wetlands. Medicinal plants cannot be used if the water they grow in is polluted. Concern was also expressed around garbage washing up on beaches and whether commercial fisherman and recreational boat owners are properly disposing of their waste.

It was further suggested that more policing of waterways is needed, and fines should be issued when people are caught discarding waste into the water.

The concept of Two-Eyed Seeing was shared during the development of this plan. Etuaptmumk is the Mi'gmaq word for Two-Eyed Seeing. Etuaptmumk (Two-Eyed Seeing) is often explained by saying it refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing and learning to use both these eyes together, for the benefit of all (Institute for Intergrative Science & Health). In essence, it is important that Indigenous knowledge be considered in addition to Western knowledge when implementing the Shediac Bay Watershed Management Plan.

The First Nation engagement that took place during the development phase of the Shediac Bay Watershed Management Plan was a starting point for First Nations Involvement in this plan. This initial engagement resulted in recommendations being made for gathering indigenous knowledge in the Shediac Bay Watershed and the sharing of this knowledge through education and awareness programs. These recommendations are included as actions in the following section and will be pursued during the implementation phase.

In total, 26 actions were developed by the Technical Working Group to address the concerns identified during the consultation process, and these actions were grouped within seven overarching goals. Leads and partners were identified for each action to clearly define roles, and timeframes were selected to guide and help prioritize actions. The various actions were assigned specific timeframes based on the number of years it could take to complete the action, (e.g. up to two years, up to five years, up to ten years). It is important to note that this Watershed Management Plan is not regulatory in nature and all timeframes listed in Table 4 will be dependent on the availability of funding and the participation of partners and volunteers. Accessibility of funding and collaboration with partners will be critical for the successful implementation of this plan. Key performance indicators of success to measure the effectiveness of an action, will be developed by the leads of each action and the Implementation Committee as they are initiated.

Shediac Bay Watershed Management Plan Goals:

Goal #1: Implement the Watershed Management Plan
Goal #2: Protect and Improve Water and Habitat Quality
Goal #3: Improve Stormwater Management
Goal #4: Improve Wastewater Management
Goal #5: Protect the Coastal Areas of the Watershed
Goal #6: Education, Awareness and Communication
Goal #7: Protect Water Quality at Parlee Beach

Table 4: Shediac Bay Watershed Goals and Actions

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
Goal #1: Implement the Watershed Management Plan			
1. Create a Watershed Management Plan Implementation Committee. • Identify key performance indicators of success for each action to measure their progress. • Actions are prioritized and implemented annually. • Share progress publicly each year.	Lead: Shediac Bay Watershed Association (SBWA) Partners: The leads for each specific action	Short and long-term	NB Environmental Trust Fund, in-kind funding, etc.
2. Collaborate with partners on similar/overlapping initiatives (e.g. EcoVision, Town of Shediac Climate Change Adaptation Plan).	Lead: Watershed Management Plan Implementation Committee Partners: Shediac Bay Watershed Association, Town of Shediac, Local Service Districts of Grand-	N/A	N/A

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Digue, Moncton Parish, Shediac Bridge-Shediac River, Scoudouc and Pointe-du-Chêne; Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		
Goal #2: Protect and Improve Water and Habitat Quality			
3. Complete stream surveys (i.e. walk the streams with landowner permission while focusing on point source pollution (pipes) and fish habitat health including areas where buffer zones are lacking, sedimentation issues, etc.) This will help in planning and prioritizing future actions. The issues identified should be photographed and mapped (e.g. GPS points). • Stream barriers/obstructions will also be identified during the stream surveys.	Lead: Shediac Bay Watershed Association Partners: Environment and Climate Change Canada (Conduct shoreline sanitary surveys), Department of Fisheries and Oceans Canada, other community-based groups/organizations,	Short/medium-term	NB Environmental Trust Fund, EcoAction Community Funding Program, NB Wildlife Trust Fund, DFO Habitat Stewardship Program

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	and Fort Folly Habitat and Restoration		
4. Complete a physical habitat assessment of the watershed. Characterize the streams and rivers of the watershed (e.g. canopy, algae, substrate composition, temperature, flow, bank erosion measurements), and comparative analysis to any previous information/surveys. • Any habitat concerns identified will be shared with the Department of Fisheries and Oceans Canada. • Physical habitat assessments should be completed at the Shediac Bay Watershed Association long-term monitoring stations and other sites as needed. • The habitat assessments should be repeated every few years to monitor for any changes.	Leads: Shediac Bay Watershed Association; Mi'gmawe'l Tplutaqnn Inc., Anquantum, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation, Indian Island First Nation Partners: NB Department of Environment and Local Government, NB Department of Natural Resources and Energy Development (stream surveys protocol for fish habitat), Fort Folly Habitat and Restoration, and the	Short/medium-term	NB Environmental Trust Fund, EcoAction Community Funding Program, salmon and fish foundations or programs (e.g. Atlantic Salmon Conservation Foundation, Fisheries and Oceans Canada), and NB Wildlife Trust Fund, Indigenous Protection and Conserved Areas (IPCA) program funding

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Department of Fisheries and Oceans Canada		
5. Gather indigenous knowledge in the Shediac Bay Watershed.	Leads: Mi'gmawe'l Tplutaqnn Inc., Anquantum, Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation Partners: NB Department of Environment and Local Government, and Shediac Bay Watershed Association	Short/medium-term	NB Environmental Trust Fund (depending on project scope. i.e. environmental or educational work)
6. Reduce excess nutrients in the watershed originating from human activities (e.g. total phosphorus, total nitrogen). • Develop feasible nutrient reduction goals and plans. This can be done with the advice of	Lead: NB Department of Environment and Local Government Partners: Shediac Bay Watershed Association,	Short-term	NB Environmental Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
technical experts and/or academia as needed. Examples of nutrient reduction goals may include but are not limited to the following: monitoring results are below the guideline value* a certain percentage of the time or sites with elevated nutrients show decreases over time.	university researchers, the NB Department of Agriculture, Aquaculture and Fisheries, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		
• The implementation of actions from the Watershed Management Plan (e.g. action # 11, 12, 14 -18) by their respective leads could reduce anthropogenic sources of nutrients in the Shediac Bay Watershed starting with priority areas such as the Scoudouc River watershed and small coastal streams (e.g. sampling locations: WQ8, WQ10 and WQ11).	Leads and partners are outlined under each action.	Medium-term	
7. Reduce bacteria *(E. coli* and Enterococcus) in the watershed originating from human activities.	Lead: NB Department of Environment and Local Government	Short-term	NB Environmental Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
• Develop achievable *E. coli* and Enterococcus reduction goals. This can be done with the help of technical experts and/or academia as needed. For example, monitoring results are below the *Guidelines for Canadian Recreational Water Quality* a certain percentage of the time or sites with elevated bacteria show decreases over time.	Partners: Shediac Bay Watershed Association, university researchers, NB Department of Agriculture, aquaculture and Fisheries, the Town of Shediac, Local Service Districts of Grand-Digue, Shediac Bridge-Shediac River, Scoudouc, Moncton Parish, and Pointe-du-Chêne; Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		
• The implementation of actions from the Watershed Management Plan (e.g. action # 11, 12, 14- 18) by their respective leads, in	Leads and partners are outlined under each action.	Medium-term	

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
order of priority to reduce and eliminate anthropogenic sources of bacteria.			
8. Acknowledge landowners who implement Beneficial Management Practices that will help reduce nutrients and bacteria in the watershed. This could be done by profiling the landowner in a newsletter, on a webpage, by posting a sign on their property, by using the property for educational purposes, etc.	Leads: Leads and/or partners of any given action, Agricultural Alliance of NB, Blue Flag (marinas, beaches), Local Governments (EcoVision 2025), and the Greater Shediac Chamber of Commerce (program being developed for businesses)	Medium-term	NB Environmental Trust Fund, TD Friends of the Environment Foundation Grant
9. Continue and improve the SBWA long-term water quality monitoring program, as needed, to monitor changes and improvements in the watershed over time. For more information, please refer to the water quality monitoring sections on pages 18 and 56.	Lead: Shediac Bay Watershed Association Partners: NB Department of Environment and Local Government, Universities (e.g. Université de Moncton, Mount Allison University, University of New Brunswick), Environment	Long-term	Environmental Trust Fund, EcoAction Community Funding Program, NB Wildlife Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	and Climate Change Canada (CABIN program), Department of Fisheries and Oceans Canada, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island		
10. Understand surface water quality in the watershed. • Water quality data is reviewed and assessed on an annual basis by the Shediac Bay Watershed Association or by someone appointed by them. Advice can be obtained from water quality specialists as needed. • The annual water quality data assessment will be shared publicly. Reporting may include but	Leads: Shediac Bay Watershed Association Partners: NB Department of Environment and Local Government, Atlantic Water Network (Atlantic Data Stream), Universities (Université de Moncton, Mount Allison University, University of New Brunswick), Environment	Short-term	NB Environmental Trust Fund, EcoAction Community Funding Program

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
is not limited to the following formats: newsletters, information session, summary type reporting, etc. • A state of the watershed report will be written every five years.	and Climate Change Canada, and the Department of Fisheries and Oceans Canada, and Mi'gmawe'l Tplutaqnn Inc. Lead: Shediac Bay Watershed Association or someone appointed by the committee	Medium-term	
11. Build relationships with farmers and other partners. • Form a working group tasked with the following actions: ○ Developing a questionnaire for local famers along with a site visit to increase our knowledge of the various agricultural practices in the watershed (e.g. type of farms, type and timing of fertilizer applications). ○ Identifying funding programs and work in collaboration with farmers to	Lead: NB Department of Agriculture, Aquaculture and Fisheries (regional office) Partners: local farmers, Shediac Bay Watershed Association, Université de Moncton researchers, Agricultural Alliance of NB, NB Soil and Crop Improvement Association, and the NB Department of	Long-term	Environmentally Sustainable Agriculture, NB Environmental Trust Fund, Harmful Alternation Disruption or Destruction (HADD), Environmental Damages Fund, TD Friends of the Environment Foundation Grant, DFO Habitat Stewardship Program

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
help them apply Beneficial Management Practices on their farms such as: ➢ Installing cattle fencing to keep cattle out of watercourses. ➢ Installing watercourse crossings for cattle if needed. ➢ Revegetating buffer zones where needed. ➢ Providing alternative water supplies for cattle when access to a watercourse is removed. ➢ Managing manure spreading including the timing of application.	Environment and Local Government -Regional Water Planning Officer		
12. Maintain and improve buffer zones in riparian areas. • Work in collaboration with riparian and coastal landowners to improve buffer zones by revegetating where needed. • Educate riparian and coastal landowners about the importance of maintaining	Lead: Shediac Bay Watershed Association Partners: NB Department of Environment and Local Government (Watercourse and Wetland Alteration), Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly	Long-term	NB Environmental Trust Fund, EcoAction Community Funding Program, Insurance Bureau of Canada, NB Wildlife Trust Fund, DFO Habitat Stewardship Program

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
vegetation and improving riparian zones (i.e. information sessions, educational pamphlet).	Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation, Indian Island and Red Dot Association of Shediac Bay		
13. Continue and expand existing clean-up programs in the Shediac Bay Watershed. • Continue the annual coastal garbage clean-up program (i.e. Ménage ton Rivage). • Continue the annual garbage clean-up program in Grand-Digue. • Expand the garbage clean-up program into the Scoudouc and Shediac River watersheds (e.g. Adopt a Stream Program).	Leads: Shediac Bay Watershed Association, and the Southeast Regional Service Commission Partners: Town of Shediac (EcoVision 2025), ATV Country Wheelers Club, Local Service Districts of Grand-Digue, Shediac Bridge-Shediac River, Scoudouc, Moncton Parish and Pointe-du-Chêne, Ménage Ton Rivage/Beach Sweep program, New Brunswick Wildlife	Long-term	NB Environmental Trust Fund, volunteer base, Town of Shediac, TD Friends of the Environment Foundation Grant, NB Wildlife Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Federation Adopt a River Program, Adopt a Highway Program, the Red Dot Association of Shediac Bay, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		
Goal #3: Improve Stormwater Management			
14. Implement actions to improve stormwater quality and reduce stormwater quantity in the watershed. For example: • Installing rain barrels, reducing permeable surfaces, applying stormwater treatment measures, etc.	Lead: Shediac Bay Watershed Association Partners: Southeast Regional Service Commission, Kent Regional Service Commission, Town of Shediac, Local Service Districts of Grand-Digue, Shediac Bridge-Shediac	Long-term	NB Environmental Trust Fund, EcoAction Community Funding Program, Atlantic Provinces Association of Landscape Architects (APALA), Insurance Bureau of Canada, in-kind support from the Town of Shediac and

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	River, Scoudouc, Moncton Parish and Pointe-du-Chêne, NB Department of Environment and Local Government, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		Southeast Regional Service Commission, National Disaster Mitigation Program (NDMP) funding from Public Safety Canada
• The SBWA will continue working with landowners to develop rain gardens.	Lead: Shediac Bay Watershed Association Partner: Town of Shediac	Long-term	
• Continue the pet waste reduction program and explore opportunities to add new pet waste collection stations where needed. ○ The Town of Shediac will manage the dog waste stations within the Town limits, Parlee Beach Provincial Park	Lead: To be determined Partners: Town of Shediac and Parlee Beach Provincial Park, and Red Dot Association of Shediac Bay	Medium-term	In kind funding for the Town of Shediac and the Parlee Beach Provincial Park. NB Environmental Trust

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
will manage the stations within the park boundaries and volunteers to manage the stations within the un-incorporated areas are needed.			Fund for the un-incorporated areas
• Conducting a bird behaviour study in the Town of Shediac to identify patterns of congregation and large population roosting behaviours (important source of bacteria). Bird control measures could be explored in areas where large congregations of birds have the potential to impact water quality at Parlee Beach.	Lead: To be determined Partners: Town of Shediac, Parlee Beach Provincial Park	Medium-term	In-kind funding
• The Department of Tourism, Heritage and Culture is committed to assessing options and working with partners to explore opportunities and find feasible solutions that will address water quality and odour concerns at the Parlee Beach Provincial Park lagoon and channel.	Lead: Department of Tourism, Heritage and Culture	Short-term	In-kind funding
15. Work with the Town of Shediac to encourage the implementation of a Stormwater By-Law and Best	Lead: Town of Shediac	Short/medium-term	N/A

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
Management Practices (BMP) to help reduce stormwater run-off. E.g. bioretention systems, grassed swales, constructed wetlands, green roofs, rain gardens, porous asphalt, downspout disconnection using rain barrels, sand filters, dry retention ponds, dry/wet stormwater ponds, stormceptors, etc.	Partners: South East Regional Service Commission, and Kent Regional Service Commission		
16. Identify and mitigate sources of sedimentation (i.e. runoff) in the watershed. • Work with partners to identify and implement actions that will reduce sedimentation (erosion) in the watershed.	Lead: Shediac Bay Watershed Association Partners: ATV Country Wheelers Club, Department of Transportation and Infrastructure (dirt road management), South East Wood Marketing Board, the Agricultural Alliance of NB Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche	Long-term	NB Environmental Trust Fund, Department of Fisheries and Oceans, NB Wildlife Trust Fund, DFO Habitat Stewardship Program, Atlantic Salmon Conservation Foundation

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	First Nation and Indian Island First Nation		
Goal #4: Improve Wastewater Management			
17.The Greater Shediac Sewerage Commission will implement actions outlined in their Five-Year Plan 2021-2025 which includes infrastructure improvements, extension of existing services, elimination of infiltration, and upgrades to its wastewater treatment plant.	Lead: Greater Shediac Sewerage Commission Partners: Town of Shediac, Local Service District of Point-du-Chene, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation	Medium/long-term	Infrastructure Bilateral Agreements, Investing in Canada Infrastructure Program (ICIP), Federal Gas Tax Fund (GTF) or other infrastructure funding programs as appropriate, Atlantic Salmon Conservation Foundation, NB Wildlife Trust Fund
18. Improve the maintenance of on-site septic systems. • As outlined in Action 21 b) of *A Water Strategy for New Brunswick 2018-2028*	Leads: NB Departments of Justice and Public Safety and Health	Medium-term	Federation of Canadian Municipalities

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
"explore options for ensuring that on-site sewage systems are properly functioning and maintained". This may include improving internal access to on-site septic system information across relevant departments through identifying opportunities to link Parcel Identifier Numbers (PID)s with on-site septic system record numbers. • Education program (see goal #5) for Local Service Districts and private landowners.	Partners: Service NB, and NB Department of Environment and Local Government		
19. The two marinas will continue to subsidize their sewage disposal stations. • Tracking and reporting on the use of the sewage disposal services should be done annually.	Leads: Shediac Bay Yacht Club, and the Pointe du Chêne Harbour Authority Partner: Blue Flag initiative	Long-term	In-kind funding
Goal #5: Protect the Coastal Areas of the Watershed			
20. Develop long-term policies aimed at protecting locally important coastal features such as wetlands. A GIS modelling study of different coastal features in the	Lead: South East Regional Service Commission	Long-term	Federation of Canadian Municipalities, Natural Resources Canada, NB

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
Shediac Bay Watershed was undertaken in 2020 to increase understanding of their protective value (i.e. how they may help protect people and mitigate the impacts of climate change, and estimating the financial cost associated with replacing their functions). The results of the modelling study will be used to develop long-term policies aimed at protecting these important coastal features.	Partners: Town of Shediac, Local Service Districts of Grand-Digue, Shediac River-Shediac Bridge and Pointe-du-Chêne; NB Department of Environment and Local Government, Environment and Climate Change Canada, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		Environmental Trust Fund
21. **Implement shoreline restoration demonstration projects to increase community awareness on the importance of coastal areas.**	Lead: Shediac Bay Watershed Association Partners: Red Dot Association of Shediac Bay, Green Infrastructure Committee, Mi'gmawe'l	Medium/long-term	NB Environmental Trust Fund, Indigenous Protected and Conserved Areas Funding, NB Wildlife Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation		
22. Apply actions from the climate change adaptation plans for the Town of Shediac, the Rural Community of Beaubassin-Est, and Village of Cap-Pelé.	Leads: Town of Shediac, Rural Community of Beaubassin-Est, and Village of Cap-Pelé Partners: South East Regional Service Commission, Kent Regional Service Commission, New Brunswick Climate Change Secretariat, Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First	Medium/long-term	In-kind funding, NB Environmental Trust Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Nation, Buctouche First Nation and Indian Island First Nation		
Goal #6: Education, Awareness and Communication			
23. Develop an education program aimed at sharing indigenous knowledge in the Shediac Bay Watershed. This would include information about the historical use of the land by indigenous people, the language, the use of medicinal plants, etc.	Leads: Mi'gmawe'l Tplutaqnn Inc., Anquantum, Fort Folly Habitat and Restoration, Eel Ground First Nation, Fort Folly First Nation, Buctouche First Nation and Indian Island First Nation	Medium-term	NB Environmental Trust Fund
24.Work collaboratively with partners of existing education programs (e.g. Shediac Bay Watershed Association, Blue Flag program, Cocagne Sustainable Development Group, Homarus, etc.) to expand education and awareness programs throughout the watershed. • A collaborative approach will help avoid duplication of efforts. It will also help identify	Lead: Shediac Bay Watershed Association Partners: Parlee Beach Provincial Park, Agricultural Alliance of NB, NB Department Agriculture, Aquaculture and Fisheries, Agriculture and Agri-Food	Long-term	Environmentally Sustainable Agriculture, Nature NB Environmental Trust Fund, TD Friends of the Environment Foundation Grant (for execution of the education programs),

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
the types of existing educational programs and current educational gaps. The following are examples of beneficial educational topics: ○ For farmers: Beneficial Management Practices related to chemical fertilizers and manure spreading. ○ For landowners in riparian zones: the importance of protecting and restoring riparian zones. ○ For dog owners: how cleaning up after dogs can improve water quality in a watershed and at Parlee Beach. ○ For owners of on-site septic systems: Best Management Practices for proper system maintenance. ○ For boaters: the importance of using sewage and garbage disposal facilities. ○ For everyone: the importance of wetlands in a watershed. ○ For everyone: information to promote the Shediac Bay Watershed Management Plan and opportunities for community participation.	Canada, Red Dot Association of Shediac Bay, Université de Moncton researchers, NB Department of Environment and Local Government, and the Shediac Bay Watershed Management Plan Implementation Committee		NB Wildlife Trust Fund, Climate Action and Awareness Fund

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
○ For everyone: the impact of stormwater runoff and how you can improve and reduce the volume of stormwater. ○ For students: general information on watershed management. ○ For coastal landowners: Best Management Practices for protecting/restoring coastal areas (i.e. alternatives to rock protection).			
Goal #7: Protect Water Quality at Parlee Beach			
25. Implement actions under Goals #1 - # 6 above to help protect and improve water quality in the Shediac Bay Watershed. This will in turn help maintain good water quality at Parlee Beach.	N/A	N/A	N/A
26. Continue monitoring water quality at Parlee Beach and ensure the data remains publicly accessible.	Partners: NB Departments of Environment and Local Government, Health, and	Long-term	In-kind funding

Goals/Actions	Lead Organizations and Partners	Timeframe Short-Term: 2 years Medium-Term: 5 years Long-Term: 10 years	Potential Funding Opportunities (Note: all suggested funds are subject to independent application and approval processes)
	Tourism, Heritage and Culture		

* The Department of Environment and Local Government uses guidelines when assessing water quality data. Nitrates and total ammonia are compared to the CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. There are currently no CCME guidelines for total phosphorus (TP) nor total nitrogen. Therefore, total phosphorus is compared to Ontario's provincial objective (i.e. maximum value of 0.03 mg/L) (OMOE, 1994), while total nitrogen values are compared to Dodds et al. (1998) recommendation of less than 0.7 mg/L for avoiding eutrophication. The use of the above-mentioned guidelines is recommended however, the Shediac Bay Watershed Association and the Shediac Bay Watershed Management Plan Implementation Committee are not limited by these.

Scoudouc River Trail posted by Debbie Gallant (AllTrails App)

4

Shediac Bay Watershed Implementation Plan

4.0 Shediac Bay Watershed Implementation Plan

The main purpose of the Shediac Bay Watershed Management Plan is to address water quality issues in the watershed namely, anthropogenic or human sources of nutrients and bacteria. This will in turn, help protect and improve water quality at Parlee Beach. Implementing the actions outlined in this plan will help achieve this purpose. The near shore area of the Shediac Bay Watershed includes Parlee Beach and this area is considered the receptor environment of the watershed. In addition to implementing a long-term water quality monitoring program, any other water quality data that becomes available could be used as an additional indicator of whether the plan is working.

Following the plan is voluntary, therefore successful implementation of the plan will depend on the formation of a Watershed Management Plan Implementation Committee with balanced representation. It will also depend on the Implementation Committee's ability to access diverse sources of funding and build valuable relationships with partners and volunteers within the community.

The Implementation Committee will invite First Nation representatives to participate and will engage with Mi'gmawe'l Tplu'taqnn Inc., and other First Nation partners, as required, each year as actions are prioritized and defined to determine whether there are any infringements and/or adverse impacts on Aboriginal & Treaty Rights with respect to the projects being proposed.

The first step will be to create the Watershed Management Plan Implementation Committee and appoint a committee chair. The Implementation Committee will be a non-governmental entity made up of local representatives.

The following is a recommended list of committee representatives:

- Shediac Bay Watershed Association;
- Department of Fisheries and Oceans Canada;
- NB Department of Environment and Local Government (Moncton region);
- NB Department of Agriculture, Aquaculture and Fisheries;
- NB Department of Health;
- NB Department of Tourism, Heritage and Culture (Parlee Beach Provincial Park);
- South East Regional Service Commission;
- Local Service Districts with advisory committees;
- First Nations;
- Town of Shediac;
- Stakeholders, and
- Up to three citizens from the watershed.

The Implementation Committee should have access to technical experts (e.g. engineering firms, academic community) whenever expert advice is needed. The committee chair will be responsible for ensuring the committee stays on track with its objectives. It will be important for the committee to have a defined Terms of Reference. The Terms of Reference should include:

- Committee objectives;
- Position terms;
- Short-term and long-term schedules for the various action items, and
- Committee roles and responsibilities including:
    - Annual planning and WMP implementation;
    - Identifying funding programs;
    - Accountability for funds spent;
    - Developing key performance indicators of success for each action;
    - Working closely with the SBWA and partner organizations to promote the WMP, inform the community on actions underway and progress on the WMP;
    - Building relationships, finding partners that could help with implementation, and
    - Annual review (what worked or didn't work, changes to be made, etc.)

Once the Implementation Committee is formed, it will enter an annual implementation cycle (Figure 17). This annual cycle is further defined below.

ANNUAL WATERSHED MANAGEMENT PLAN IMPLEMENTATION CYCLE

1. ANNUAL PLANNING (Fall - Winter)

- During the annual planning phase, the Implementation Committee should prioritize and plan actions for the upcoming year, identify funding opportunities, assign a lead for each action and develop key performance indicators of success. For example:
    - Surface area of restored buffer in a calendar year;
    - Number of people present at an educational event;
    - Surface area of the watershed that was cleaned up during the garbage clean-up program, and
    - Decrease in the number of bacteria samples that were above the guidelines.

2. ACTION IMPLEMENTATION (Spring - Fall)

- The lead for each action will report to and work closely with the Implementation Committee chair as needed.

3. MONITOR KEY PERFORMANCE INDICATORS OF SUCCESS

- This should be completed throughout the year.
- Project leads are responsible for keeping track of the key performance indicators of success and reporting progress to the Implementation Committee.
- Documenting the key performance indicators of success will facilitate the next phase of the annual cycle.

4. REVIEW/SUMMARIZE RESULTS (Fall – Winter)

- Water quality data and project information are reviewed on a regular basis. The Shediac Bay Watershed Association or someone selected by the Implementation Committee will prepare an

annual summary. The summary can be in the form of a newsletter, report, poster etc. It will provide information on water quality, actions undertaken and key indicators of success.

- A state of the watershed report should be prepared every five years.
- The Shediac Bay Watershed Management Plan should be updated as needed and republished every 10 yrs.

5. COMMUNICATION / INFORMATION SHARING (Winter)

- The promotion of the WMP, informing the community on the actions underway and progress on the WMP should be planned and implemented throughout the year, in collaboration with SBWA and other partners. This may include but is not limited to:
    - An annual newsletter (see above #4);
    - A spring information session to inform the community of the Watershed Management Plan, its progress, projects that will take place that year and current water quality issues in the watershed;
    - Seeking opportunities to build partnerships with stakeholders and integrate the Watershed Management Plan into the operational plans of businesses, agencies, planning authorities, etc., and
    - Develop a web page for information regarding the WMP.

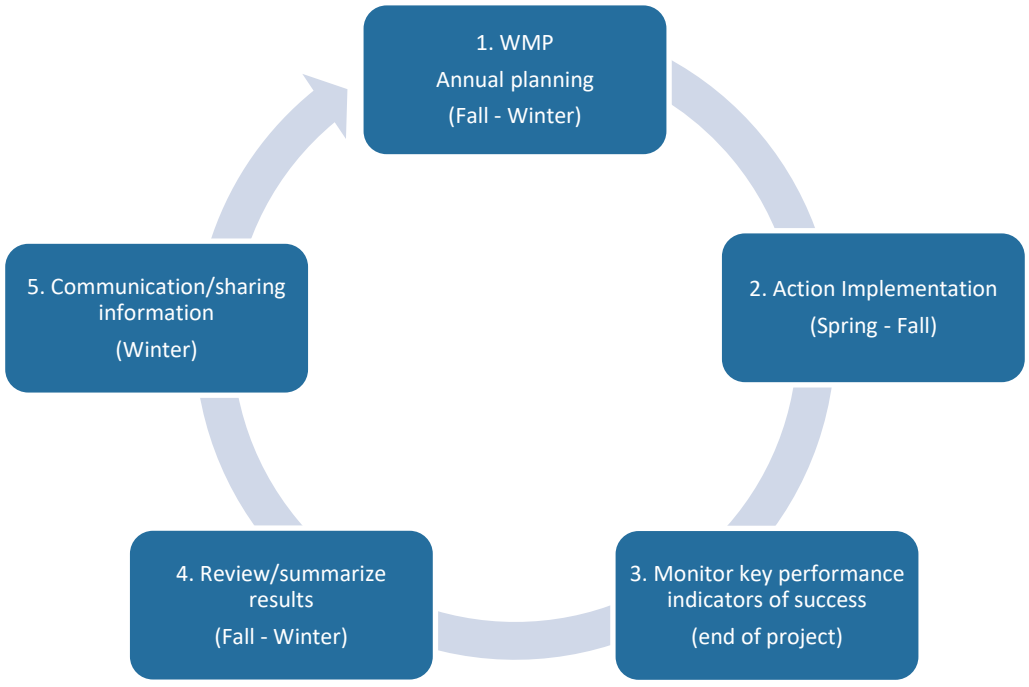


Figure 17: Annual Watershed Management Plan Implementation Cycle

4.1 Long-Term Water Quality Monitoring

The purpose of a long-term water quality monitoring program for the Shediac Bay Watershed is to identify changes in water quality over time. As actions are implemented, it will be important to assess trends in the water quality data to determine whether the plan is achieving its purpose.

An adaptive management approach should be applied when reviewing the water quality monitoring program as it will allow flexibility to make changes as more information is gathered. In other words, as actions are completed, and new data is gathered, the Watershed Management Plan and associated water quality monitoring program should be modified as needed. For example, new monitoring locations or other forms of monitoring such as benthic macroinvertebrate sampling could be added.

A long-term water quality monitoring program was initiated by the Shediac Bay Watershed Association in 1999. The water quality monitoring program is not described in detail in this plan. However, it should be reviewed annually by the Implementation Committee and the Shediac Bay Watershed Association, and advice should be obtained from water quality experts and/or academia as needed.

Field work carried out by Shediac Bay Watershed Association staff, Shediac Bay Watershed Association

5 Next Steps

5.0 Next Steps

The development of a Shediac Bay Watershed Management Plan has been the result of many years of work aimed at better understanding water quality in the watershed and at Parlee Beach. Appendix A includes a list of studies, reports and maps completed in the Shediac Bay Watershed dating back to the 1990's. Implementation of this Watershed Management Plan is the next step towards addressing identified issues and will help protect and improve water quality in the watershed and Parlee Beach.

The Shediac Bay Watershed Management Plan is intended to be a living document. Taking an adaptive management approach will allow the flexibility to make changes as needed.

There are many who care about water quality in the Shediac Bay Watershed. The use of a collaborative approach will be a key step in ensuring the successful implementation of this plan as it will encourage local ownership as well as grassroots participation. A plan developed and implemented through local partnerships can be very effective in addressing issues which will help protect and improve water quality in the long-term.

Parlee Beach Provincial Park, GNB stock photo

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7

Glossary

7.0 Glossary

Adaptive Management Approach: flexible and continuous improvement and adaptation of approaches, policies and management that is undertaken by incorporating new knowledge and innovative design, practices and technology.

Ambient: natural background conditions in the surrounding environment outside the zone in which the environment may be influenced by a point source discharge or source of contamination.

Anthropogenic sources: sources of pollution or environmental disturbance originating from human activity.

Benthic macroinvertebrates: organisms without backbones, which are visible to the eye without the aid of a microscope that live on, under, and around rocks and sediment on the bottoms of lakes, rivers and streams.

Best Management Practices (BMP): methods, measures or practices that, when installed or used, are consistent with an efficient, practical, technically and environmentally sound activity. A BMP designed specifically with respect to water quality will prevent, reduce or correct water pollution.

Buffer zone: an area of land of a defined width that separates an environmentally sensitive area (e.g. a watercourse or a wetland) from an activity that could have an adverse effect on the environmentally sensitive area (e.g. timber harvesting, excavation or construction). Examples of buffer zones used in New Brunswick include a 75-meter set-back between streams used for drinking water and surface water and potentially harmful contaminants, and a requirement to obtain a permit for proposed activities within 30 meters of a watercourse or wetland.

Canadian Council of Ministers of the Environment (CCME): an intergovernmental forum for collective action on environmental issues of national and international concern, led by Canadian ministers of the environment (federal, provincial and territorial).

Coastal areas: areas on the border between land and sea that include features such as beaches, dunes, coastal marshes, inter-tidal areas, dyked lands and rock platforms.

Cumulative effect: the environmental effects of two or more individual human activities that can combine and interact with each other to cause aggregate effects that may be different in nature or extent from the effects of the individual activities.

Environmental Trust Fund (ETF): a funding source provided by the government of New Brunswick dedicated to community-based, action-oriented activities aimed at protecting, preserving and enhancing New Brunswick's natural environment.

Environmentally sensitive areas: "*Places that have special environmental attributes that are worthy of retention or special care*." (Source: British Columbia, 2004. Environmental Best Management Practices for Urban and Rural Land Development, p 5-1).

Guideline: a set of standards, procedures or practices that are intended to help obtain a desired result but are typically not legally binding.

Implementation: the process of putting a plan, policy or decision into action.

Integrated Watershed Management: a continuous, adaptive process of managing human activities and ecosystems at the watershed scale. It integrates multiple concepts and methods, including water management and land use planning and evaluates and manages cumulative impacts.

Invasive species: plants, animals or other organisms introduced to a new location as a result of human activity, including climate change. Species are considered invasive when their introduction or spread threatens to disrupt existing ecosystems.

Non-point sources: diffuse or widely distributed sources of contaminant discharge to water that cannot be attributed to a single, specific location. Discharges from non-point sources typically reach a surface or groundwater indirectly via wind, overland flow (precipitation or snow melt) or infiltration.

Nutrients: various chemical compounds and elements essential to the growth and survival of living organisms. In aquatic ecosystems, nitrogen and phosphorus are the most important, as they are most often in short supply relative to the needs of aquatic plants, algae, and micro-organisms.

Performance indicators: measurable, verifiable characteristics designed to identify, track and report on: a) progress in implementing a plan, strategy, etc.; b) trends in environmental quality; or c) the effectiveness of laws, policies or guidelines at achieving a desired goal.

Representative Concentration Pathway (RCP): "*These are standard scenarios that are used in climate modeling to simulate how the climate might change in response to different levels of human activity. In effect, they represent possible trajectories of greenhouse gas concentrations. Four RCP scenarios were developed to guide climate research, each leading to a different degree of radiative forcing (indicated by the number given to each RCP). RCP8.5 leads to the most warming and describes a possible future resulting from ongoing increases in greenhouse gas emissions (we refer to this as the "High Carbon Scenario" in the Atlas). RCP2.6 leads to the least warming and reflects a future shaped by aggressive and immediate efforts to drastically reduce greenhouse gas emissions. RCP4.5 (our "Low Carbon Scenario") and RCP6.0 are between these extremes, and model futures in which some mitigation of emissions prevents the extreme warming seen in RCP8.5."* (Source: Climate Atlas of Canada).

Riparian zone: *"The lands adjacent to streams, rivers, lakes, ponds, and wetlands. These areas are frequently flooded transitional lands, with no definite boundaries, between the body of water and drier upland areas. Included in the riparian zone are streambanks, the floodplain and plant and animal communities. Riparian zones have diverse plant communities that include both water-loving and upland plants. Many animal species depend on riparian zones for survival, including some species at risk.*

Riparian zones are productive and valuable areas that provide social, environmental and economic benefits" (Source: Harris, P. 2010. Beneficial Management Practices for Riparian Zones in Atlantic Canada).

Watercourse: a feature in which the primary function is the conveyance or containment of water, which includes: the bed, banks and sides of any incised channel greater than 0.5 meters in width that displays a rock or soil bed; water/flow does not have to be continuous and may be absent during any time of year; or a natural or man-made basin.

Watershed Management Plan: a proactive, comprehensive plan that is developed in partnership with First Nations, stakeholders, watershed groups and interested individuals. Its purpose is to build relationships between the partners and to guide the management of water quality and quantity within a specific watershed, in order to achieve a set of desirable outcomes (e.g. achieving water quality objectives).

Watershed: all the watercourses (lakes, rivers) and wetlands that drain to a single, defined point (e.g. the mouth of a river) plus all the land that contributes drainage to these watercourses.

Wetland: land that has the water table at, near, or above the land's surface, or which is saturated, for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activities adapted to the wet environment.

APPENDIX A: List of Studies, Reports and Maps in the Shediac Bay Watershed

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
1	Final Report	2019 Intensive Stormwater Sampling Program in The Shediac Bay Watershed	English French	Consulting Service in Environmental Sciences	Robert N. Hughes	2020/11	GNB
2	Final Report	2019 Parlee Beach and Shediac Bay Watershed Water Quality Results	English French	Wood Environment & Infrastructure Solutions	Paynter, J.	2020/02/27	GNB
3	Map	Map 1: 2017-2019 Government Investments in the Shediac Bay Watershed, Parlee Beach and Surrounding Area	English French	Government of New Brunswick	Department of Environment and Local Government	2019/07/12	GNB
4	Map	Map 2: 2017-2019 Government Investments in the Shediac Bay Watershed, Parlee Beach and Surrounding Area	English French	Government of New Brunswick	Department of Environment and Local Government	2019/07/13	GNB
5	Final Report	2019 Dog Waste Stations Project	English	The Red Dot Association of Shediac Bay	Malolepszy, A., Wedge, P., Wedge, H., Melanson, A., & T. Brydges	2019/10/11	ETF
6	Final Report	2018 Dog Waste Station Final Report	English French	The Red Dot Association of Shediac Bay	Malolepszy A., Wedge P., Wedge, H., Melanson A. & T. Brydges	2018/10/28	GNB
7	Final Report	2018 Parlee Beach and Shediac Bay Watershed Water Quality Results	English French	Wood Environment & Infrastructure Solutions	Paynter, J.	2019/03/22	GNB

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
8	Final Report	Parlee Beach Water Quality: Review of Stormwater Results 2017-2018 Approaches to Stormwater Quality Management Data and Information Gaps	English French	Consulting Service in Environmental Sciences	Hughes, R.	2019/03/01	GNB
9	Final Report	Targeted Onsite Septic System Investigation - Response to NATECH Report Findings	English French	NATECH Environmental Inc	NATECH Environmental Inc	2019/06/01	GNB
10	Final Report	Evaluation of Predictive Modeling for Parlee Beach	English French	Fuss & O'Neill, Inc.	Mas D. & S.Hardesty	2019/03/31	GNB
11	Final Report	Hydrodynamic and Water Quality Hindcasting at Parlee Beach	English French	Wood Environment & Infrastructure Solutions	Wood Environment & Infrastructure Solutions	2019/04/22	GNB
12	Final Report	Parlee Beach Provincial Park Channel Assessment - Study & Report	English French	Crandall Engineering Ltd.	Gallant C., Schroer J. & V. Roussel	2019/02/14	GNB
13	Final Report	Parlee Beach Water Quality Shediac, New Brunswick Final Report	English French	Steering Committee for Parlee Beach Water Quality	Paynter, J. (Project Manager), Gould, K. (DOH), Fox, D. (DELG), Lagacé, S. (DELG), Basque, A. (DTHC), Foster, A. (DTHC), Kinnie, B (DAAF)	2018/03/16	GNB
14	Summary	Parlee Beach Water Quality Summary Document	English French	Steering Committee for Parlee Beach Water Quality	Paynter, J. (Project Manager), Gould, K. (DOH), Fox, D. (DELG), Lagacé, S. (DELG), Basque, A. (DTHC), Foster, A. (DTHC), Kinnie, B. (DAAF)		GNB
15	Summary	Continuing to Address Recreational Water Quality at Parlee Beach: A Renewed Work Plan	English French	Steering Committee for Parlee Beach Water Quality	Paynter, J. (Project Manager), Gould, K. (DOH), Fox, D. (DELG), Lagacé, S. (DELG), Basque, A. (DTHC),	2018/03/28	GNB

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
					Foster, A. (DTHC), Kinnie, B (DAAF)		
16	Final Report	Parlee Beach and Shediac Bay Hydrodynamic Modelling Study New Brunswick	English French	Amec Foster Wheeler Environment & Infrastructure	Amec Foster Wheeler Environment & Infrastructure	2017/12/08	GNB
17	Final Report	2017 Parlee Beach Sand Bacteria and Shallow Groundwater Flow Path Study	English French	Stantec Consulting Ltd.	Stantec Consulting Ltd.	2018/01/25	GNB
18	Final Report	Status Review of On-Site Sewage Disposal in the Unserviced Areas near Parlee Beach	English French	NATECH Environmental Services Inc	NATECH Environmental Services Inc	2017/12/15	GNB
19	Final Report	State of the Bay Water Quality Surveys for *E. coli* in the Shediac Bay Watershed 2000-2017	English French	Shediac Bay Watershed Association	Donelle, R.	2017/11/01	GNB
20	Protocol	A Guiding Principles Document to Assess Cumulative Effects in the Shediac Bay Area	English French	Amec Foster Wheeler Environment & Infrastructure	Amec Foster Wheeler Environment & Infrastructure	2017/07/01	GNB
21	Appendix	Potential Cumulative Effects on Water Quality (Primarily Faecal Coliform Bacteria) - Draft	English French	Government of New Brunswick & Organizations	Government of New Brunswick & Organizations		GNB
22	Final Report	Wetland Delineations Near Shediac, New Brunswick	English French	Overdale Environmental Inc & Atlantic Canada Conservation Data Centre	Popma, T. & S. Blaney	2017/11/30	GNB

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
23	Summary	Parlee Beach Research Group: Bather Density, Pathogen Shedding and Water Quality	English French	Government of New Brunswick	Department of Environment and Local Government	2017/06/27	GNB
24	Summary	Parlee Beach Research Group: Beach Management Practices	English French	Government of New Brunswick	Department of Environment and Local Government	2017/08/21	GNB
25	Final Report	Parlee Beach Provincial Park Best Management Practices	English French	Government of New Brunswick	Department of Environment and Local Government		GNB
26	Project	Dog Waste Stations Project - The Red Dot Association of Shediac Bay	English French	The Red Dot Association of Shediac Bay	Malolepszy A., Wedge P., Wedge, H., Melanson A. & T Brydges	2017/10/01	GNB
27	Brochure	Dog Waste Pollutes our Shediac Bay! - Handout	English French	The Red Dot Association of Shediac Bay	The Red Dot Association of Shediac Bay		GNB
28	Monitoring Plan	Parlee Beach Water Quality: Monitoring Plan for 2017	English French	Independent Environmental Sciences	Hughes, R.	2017/05/01	GNB
29	Interim Report	2017 Faecal Loads in South East New Brunswick Waters - Towards Citizen Monitoring New Brunswick Environmental Trust Fund	English French	Mount Allison University	Garlock, E., Corkum, M. & D., Campbell	2017/09/29	GNB
30	Brochure	Shediac Bay Faecal Contamination	English French	Mount Allison University	Bhojwani, R., Cossar D., Duke K. & T. Oshima	2017/04/10	GNB
31	Brochure	A Spatial Assessment of Fecal Coliform Contamination in Shediac Bay	English French	Mount Allison University	Demers, J., Mackeigan, P., Power, A. & Z. Quintal		GNB

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
32	Brochure	Shediac Bay Contamination: A GIS Perspective - Strata 1	English French	Mount Allison University	McIntyre, L., Rudderham, V., Gallant K. & R. Gallant		GNB
33	Brochure	Analysis of Shediac Bay and Surrounding Area - Strata 2	English French	Mount Allison University	Porter, E., Penney, L. & N. Noyes-West	2017/04/01	GNB
34	Brochure	Shediac Bay Faecal Contamination - Kouchibouguac (Control Area)	English French	Mount Allison University	Cormier, X., Forrest, D., Morrison, J. Phillips, B. & R. Maxime		GNB
35	Brochure	The Efficacy of Three Water Quality Testing Techniques	English French	Mount Allison University	McKibben, A. & J. Grant-Burt		GNB
36	Standard Procedure	Standard Operating Procedure for Collecting Surface Water Quality Samples for the Parlee Beach Watershed Monitoring Assessment	English French	Government of New Brunswick	Department of Environment and Local Government	2017/07/25	GNB
37	Communication	Review of Various Items Province of NB Parlee Beach Reviews and Analysis	English French	Crandall Engineering Ltd.	Cormier, M.	2017/03/14	GNB
38	Communication	Parlee Beach Sewer System Improvements - NB Department of Tourism, Heritage and Culture: Preliminary Cost Estimate and Phase of Work	English French	Crandall Engineering Ltd.	Cormier, M.	2017/09/06	GNB
39	Preliminary Report	Parlee Beach Sewerage System Condition Assessment	English French	Crandall Engineering Ltd.	Gallant C., & M. Cormier	2017/07/25	GNB
40	Final Report	Environmental Evaluation of the Health of the Shediac Bay 2019	English	Shediac Bay Watershed Association	Hébert, J., Donelle, R. & R. Leblanc	2020/03/01	SBWA

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41	Final Report	Environmental Evaluation of the Health of the Shediac Bay 2018	English	Shediac Bay Watershed Association	Hébert, J., Donelle, R. & R. Leblanc	2019/03/01	SBWA
42	Final Report	Environmental Evaluation of the Health of the Shediac Bay 2017	English	Shediac Bay Watershed Association	Hébert, J., Boyd, S. & R. Donelle	2018/03/01	SBWA
43	Final Report	Environmental Evaluation of Shediac Bay Phase 1-2016	English	Shediac Bay Watershed Association	Donelle, R. Weldon, J. & J. Richard	2017/03/01	SBWA
44	Final Report	Water Sampling in Shediac Bay 2015-2016 by the Shediac Bay Watershed Association	English	Shediac Bay Watershed Association	Weldon, J. & R. Donelle	2016/11/01	SBWA
45	Summary	Maritime Marsh Monitoring Program	English	Shediac Bay Watershed Association & Maritimes Marsh Monitoring Program	Lightfoot, H. & L. Tranquilla	2017/02/28	SBWA
46	Final Report	Analysis of Factors that Influence Water Quality in Shediac Bay Vol 1	English	Henderson Environmental Consultant Ltd.& Mount Allison University Rural and Small Town Program	Henderson Environmental Consultant Ltd.	1999/09/01	SBWA
47	Final Report	Initial Oceanographic Assessment of Currents and Exchange in Shediac Bay	English	Henderson Environmental Consultant Ltd. & Coastal Ocean Associates Inc.	Coastal Ocean Associates Inc.	1999/09/01	
48	Proposal	Analysis of Factors that Influence Water Quality in Shediac Bay	English	Mount Allison University & Crandall Engineering Ltd.	Crandall Engineering Ltd.	1999/08/09	

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
49	Final Report	Improving Water Quality in the Shediac and Scoudouc Rivers-Report 2019	English	Shediac Bay Watershed Association	Hébert, J., Donelle, R. & R. Leblanc	2020/03/01	SBWA
50	Final Report	Improving Water Quality in the Shediac and Scoudouc Rivers-Report 2018	English	Shediac Bay Watershed Association	Hébert, J., Donelle, R. & R. Leblanc	2019/03/01	SBWA
51	Final Report	Improving Water Quality in the Shediac and Scoudouc Rivers-Report 2017	English	Shediac Bay Watershed Association	Hébert, J. & S. Boyd	2018/03/01	SBWA
52	Final Report	Improving Water Quality in the Shediac and Scoudouc Rivers-Report 2016	English	Shediac Bay Watershed Association	Hébert, J. & M. Tremblay	2017/03/01	SBWA
53	Final Report	Using Partnerships for Water Quality Monitoring and Remediation	English	Shediac Bay Watershed Association	Hébert, J. & R. Donelle	2016/03/01	SBWA
54	Final Report	Water Quality Remediation and Public Outreach Program 2014	English	Shediac Bay Watershed Association	Hébert, J.	2015/03/01	SBWA
55	Final Report	Water Quality Remediation and Public Outreach Program 2013	English	Shediac Bay Watershed Association	Paquette, J.	2013/03/01	SBWA
56	Final Report	Water Quality Remediation and Public Outreach Report 2012	English	Shediac Bay Watershed Association	Paquette, J.	2013/03/01	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
57	Final Report	Water Quality Remediation and Public Outreach Report 2011	English	Shediac Bay Watershed Association	Bourgeois, J.	2012/03/01	SBWA
58	Final Report	Water Quality Remediation and Public Outreach Report 2010	English	Shediac Bay Watershed Association	Bourgeois, J.	2011/03/01	SBWA
59	Final Report	Water Quality Remediation and Public Outreach Report 2009	English	Shediac Bay Watershed Association	Audet, D.	2010/03/01	SBWA
60	Final Report	Water Quality Remediation and Public Outreach Report	English	Shediac Bay Watershed Association	Bourgeois, J.	2010/03/01	SBWA
61	Final Report	Water Quality Remediation and Public Outreach Report 2008	English	Shediac Bay Watershed Association	Audet, D.	2009/03/31	SBWA
62	Final Report	Water Quality Remediation and Public Outreach Report 2007	English	Shediac Bay Watershed Association	Audet, D. & J. Bourgeois	2008/03/31	SBWA
63	Final Report	Water Quality Remediation and Public Outreach Report 2006	English	Shediac Bay Watershed Association	Audet, D. & J. Bourgeois	2007/03/31	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
64	Final Report	Water Quality Remediation and Public Outreach Report 2005	English	Shediac Bay Watershed Association	Audet, D.	2006/03/31	SBWA
65	Final Report	Water Quality Remediation and Public Outreach Report 2004-2005	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2005/04/15	SBWA
66	Final Report	Water Management, Remediation and Community Capacity Development	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2004/06/26	ETF
67	Final Report	Water Quality Analysis for the Shediac Bay Watershed	English	Shediac Bay Watershed Association	Poirier, J.	2003/06/27	ETF
68	Final Report	Salmonid Habitat Evaluation, Restoration and Education for the Shediac Bay Watersheds Report 2019	English	Shediac Bay Watershed Association	Donelle, R, Hébert, J., Leblanc, R. Weldon, J. & C. Legresley	2019/07/11	SBWA
69	Final Report	Eelgrass Restoration and Restoration Report 2018	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2019/03/01	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
70	Final Report	Salmonid Habitat Evaluation, Restoration and Education for the Shediac Bay Watershed Report 2018	English	Shediac Bay Watershed Association	Donelle, R., Hébert, J. Leblanc, R., Weldon, J. & C. Legresley	2018/07/10	SBWA
71	Final Report	Fish Habitat Restoration, Evaluation and Education for the Enhancement Salmonid Populations in Shediac Bay Watershed Report 2017	English	Shediac Bay Watershed Association	Hebert, J. & R. Leblanc	2017/12/11	SBWA
72	Final Report	Habitat Evaluation, Restoration and Education for the Salmonid Populations in Shediac Bay Watershed Report 2016	English	Shediac Bay Watershed Association	Hébert, J. & J. Richard	2016/11/30	SBWA
73	Final Report	Habitat Evaluation, Restoration and Education for the Salmonid populations in Shediac Bay Watershed - Report 2015	English	Shediac Bay Watershed Association	Hébert, J.	2015/11/30	SBWA
74	Final Report	Dam Removal and Riparian Restoration for Habitat Enhancement - Report 2014	English	Shediac Bay Watershed Association	Weldon, J. & J. Hébert	2014/12/01	SBWA
75	Final Report	NBWTF Salmonid Enhancement and Public Engagement Program - Report 2014	English	Shediac Bay Watershed Association	Donelle, R. & J. Hébert	2014/10/30	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
76	Final Report	NBWTF Salmonid Enhancement and Public Engagement Program - Report 2013	English	Shediac Bay Watershed Association	Donelle, R.	2014/03/01	SBWA
77	Final Report	Oyster Habitat Restoration - Report 2006	English	Shediac Bay Watershed Association	Audet, D.	2006/03/31	SBWA
78	Project	Restoration Cornwall Brook - Report 2006	English	Shediac Bay Watershed Association	Leblanc, M. & D. Audet	2007/01/01	SBWA
79	Final Report	Education on Water Conservation and Stormwater Management in the Shediac Bay Watershed-2019	English	Shediac Bay Watershed Association	Hébert, J. & R. Donelle	2020/03/01	SBWA
80	Final Report	Education on Water Conservation and Stormwater Management in the Shediac Bay Watershed-2018	English	Shediac Bay Watershed Association	Hébert, J. & R. Donelle	2019/03/01	SBWA
81	Final Report	Education on Water Conservation and Stormwater Management in the Shediac Bay Watershed-2017	English	Shediac Bay Watershed Association	Hébert, J.	2018/03/01	SBWA

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82	Final Report	Education on Water Conservation and Stormwater Management in the Shediac Bay Watershed - 2016	English	Shediac Bay Watershed Association	Hébert, J.	2017/03/01	SBWA
83	Final Report	Environmental Management, Outreach, Education and Engagement -2015	English	Shediac Bay Watershed Association	Hébert, J.	2016/03/01	SBWA
84	Final Report	ETF Energy Conservation Awareness Program-Report 2011	English	Shediac Bay Watershed Association	Bourgeois, J.	2012/03/31	SBWA
85	Action Plan Guide	Ecoaction Blue Bay - Report 2009	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2010/03/01	SBWA
86	Final Report	ETF Energy Conservation Awareness Program - Report 2009	English	Shediac Bay Watershed Association	Dawson, E. & T. Melanson	2010/03/31	SBWA
87	Final Report	ETF Energy Conservation Awareness Program - Report 2008	English	Shediac Bay Watershed Association	Bourgeois, J. & J. Paquette	2009/03/21	ETF

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88	Final Report	Ecoaction Blue Bay - Report 2006	English	Shediac Bay Watershed Association	Audet, D.	2007/08/31	SBWA
89	Final Report	Ecoaction Green Boating - Report 2005	English	Shediac Bay Watershed Association	Audet, D. & C. Caissie	2006/03/31	SBWA
90	Final Report	Identifying Habitat for the Brook Floater in the Shediac Bay Watershed 2019	English	Shediac Bay Watershed Association	Hébert, J. & R. Donelle	2020/03	SBWA
91	Final Report	Green Crab Survey in Coastal Waters of the Shediac Bay 2013-2019	English	Weldon Environmental Consultant	Weldon, J.	2019/12	SBWA
92	Final Report	Identifying Habitat for the Brook Floater in the Shediac Bay Watershed 2018	English	Shediac Bay Watershed Association	Hébert. J., Donelle, R. & R. Leblanc	2019/03	SBWA
93	Final Report	Green Crab Survey in Coastal Waters of the Shediac Bay 2013-2018	English	Weldon Environmental Consultant	Weldon, J.	2018/12	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
94	Final Report	Green Crab Survey in Coastal Waters of the Shediac Bay 2013-2017	English	Weldon Environmental Consultant	Weldon, J.	2017/12	SBWA
95	Final Report	Identifying Brook Floater Habitat in the Shediac Bay Watershed 2019	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2020/03	SBWA
96	Final Report	Identifying Brook Floater Habitat in the Shediac Bay Watershed 2016	English	Shediac Bay Watershed Association	Hébert, J.	2017/01	SBWA
97	Final Report	Green Crab Monitoring Report - 2015	English	Weldon Environmental Consultant	Weldon, J.	2015/11	SBWA
98	Final Report	Identifying Critical Habitat for the Brook Floater in the Shediac Bay Watershed - 2015	English	Shediac Bay Watershed Association	Hébert, J.	2016/03/31	SBWA
99	Final Report	NBWTF Identifying Brook Floater Critical Habitat - Report 2014	English	Shediac Bay Watershed Association	Hébert, J.	2014/10/27	SBWA

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100	Final Report	NBWTF Common Tern Colony Conservation Program - Report 2011	English	Shediac Bay Watershed Association	Bourgeois, J.	2010/03	SBWA
101	Final Report	Freshwater Mussel Inventory - Report 2006	English	Shediac Bay Watershed Association	Caissie, C. & D. Audet	2006/03	SBWA
102	Brochure	State of the Shediac Bay and It's Watershed Volume 2 - 2017	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2017	SBWA
103	Final Report	Ecosystem Overview of the Shediac Bay Watershed - DFO 2009	English	Department of Fisheries and Oceans	LeBlanc, C., Turcotte-Lanteigne, A., Audet, D. & E. Ferguson	2009	SBWA
104	Final Report	NBWTF Sedimentation - Report 2008	English	Shediac Bay Watershed Association	Audet, D.	2010/01	SBWA
105	Final Report	Stream Crossing Inventory and Assessment - Report 2008	English	Shediac Bay Watershed Association	Audet, D. & J. Bourgeois	2008/03	SBWA

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
106	Final Report	Septic System Improvement - Phase V	English	Shediac Bay Watershed Association	Audet, D.	2008/03/31	SBWA
107	Final Report	Septic System Improvement - Phase IV	English	Shediac Bay Watershed Association	Audet, D.	2007/03/31	ETF
108	Final Report	Status of the Shediac Bay and it's Watershed - 2006	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2006	SBWA
109	Final Report	Septic System Improvement - Phase III	English	Shediac Bay Watershed Association	Audet, D.	2006/03/31	SBWA
110	Final Report	Septic System Improvement - Phase II	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2005/04/15	ETF
111	Project	Septic System Improvement and Education Project	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2004/06/26	ETF

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
112	General Info	Community Wetlands Atlas - Report 2004	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2004/06/26	SBWA
113	Final Report	Jedaick (Shediac, NB): A Nexus Through Time - Report 2002	English	Archaeoconsulting	Leonard, K.	2002/03/31	SBWA
114	Preliminary Report	Shoreline sanitary survey of the Shediac, Scoudouc, Batemans Wayne Road and Albert-Gallant Watershed 1999	English	Southeastern Anglers Association	LeBlanc-Poirier, N., M. Goguen Leblanc, S. & T. Melanson	1999/11/01	
115	Final Report	Shoreline sanitary survey of the Shediac, Scoudouc, Batemans Wayne Road and Albert-Gallant Watershed 2000 - Report and appendix A	English	Southeastern Anglers Association	Leblanc, S., Melanson, T., LeBlanc-Poirier, N. & M. Goguen	2000/02	SBWA
116	Appendix	Shoreline sanitary survey of the Shediac, Scoudouc, Batemans Wayne Road and Albert-Gallant Watershed 2000 - Appendix B	English	Southeastern Anglers Association	Leblanc, S., Melanson, T., LeBlanc-Poirier, N. & M. Goguen	2000/02/02	SBWA
117	Final Report	Shediac Island Archaeology - Report 1999	English	Archaeoconsulting	Leonard, K.	2000/04/11	SBWA

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118	Final Report	A survey for French military supply depots built in 1749-50 at the port of Shediac and on the Shediac River	English	Archaeoconsulting	Leonard, K.	2000	SBWA
119	Final Report	Evaluation of the CAMP to assess health and four coastal areas within southern Gulf of St. Lawrence	English	Canadian Technical Report of Fisheries and Aquatic Sciences 2649	Thériault, M.H., Courtenay, S. C., Godin, C. & W. B. Ritchie	2006	SBWA
120	Annual Report	SBWA - Annual report 2018-2019	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association		SBWA
121	Annual Report	SBWA - Annual report 2017-2018	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association		SBWA
122	Annual Report	SBWA - Annual report 2016-2017	English	Shediac Bay Watershed Association	Hébert, J.	2017/03/31	SBWA
123	Annual Report	SBWA - Annual Report 2015-2016	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association		SBWA

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124	Annual Report	SBWA - Annual Report 2010-2011	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2011/11/17	SBWA
125	Annual Report	SBWA - Annual Report 2009-2010	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2010/10/27	SBWA
126	Annual Report	SBWA - Annual Report 2008-2009	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2009/11/12	SBWA
127	Annual Report	SBWA - Annual Report 2007-2008	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2008/10/29	SBWA
128	Annual Report	SBWA - Annual Report 2006-2007	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2007/11/08	SBWA
129	Annual Report	SBWA - Annual Report 2005-2006	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association	2006/10/12	SBWA

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130	Annual Report	SBWA - Annual Report 2003-2004	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association		SBWA
131	Annual Report	SBWA - Annual Report 2000-2001	English	Shediac Bay Watershed Association	LeBlanc, R. & D. Goddard	2001/04	SBWA
132	Final Report	Provisional Water Classification Report 2000-2003	English	Shediac Bay Watershed Association	Morrissey, K.	2003/03	SBWA
133	Appendix	Provisional Water Classification Report-2003 Appendices	English	Shediac Bay Watershed Association	Shediac Bay Watershed Association		SBWA
134	Progress Report	Water Classification Progress Report 1999-2001	English	Shediac Bay Watershed Association	Gauvin, N., Goddard. D. & P. Jordan	2002/03/01	
135	Online Publication	Canadian Environmental Quality Guidelines	English	Canadian Council of Ministers of the Environment	Canadian Council of Ministers of the Environment	2007	CCME

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
136	Document Proposed	Management Plan for the Brook Floater (*Alasmidonta varicosa)* in Canada	English	Department of Fisheries and Oceans	Department of Fisheries and Oceans	2016	SARA
137	Final Report	Toward an Integrated Management of Eastern New Brunswick's Coastal Zones; An overview of community watershed groups and their efforts toward the integrated management of their territory	English French	Department of Fisheries and Oceans	Turcotte-Lanteigne, A. & E. Ferguson	2008	DFO
138	Journal Article	A Human Impact Metric for Coastal Ecosystems with Application to Seagrass Beds in Atlantic Canada	English	FACETS Journal	Murphy, G., Wong M., & H. Lotze	2019	FACETS
139	Final Report	The Community Aquatic Monitoring Program (CAMP) for Measuring Marine Environmental Health in Coastal Waters of the southern Gulf of St. Lawrence: 2007 Overview	English	Department of Fisheries and Oceans	Weldon, J., S. Courtenay & D. Garbary	2009	DFO
140	Final Report	Gulf of St. Lawrence: Human Systems Overview Report	English	Department of Fisheries and Oceans	Alexander, D., D Sooley, C. Mullins, M. Chiasson, A. Cabana, I. Klvana, & J. Brennan	2010	DFO
141	Final Report	Relative Abundance of Juvenile Atlantic Salmon (*Salmo salar*) and other Fishes in Rivers of Southeastern New Brunswick, from Electrofishing Surveys 1974 to 2003	English	Department of Fisheries and Oceans	Atkinson, G.	2004	DFO

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
142	Final Report	American Oyster (*Crassostrea Virginica*) Integrated Fishery Management Plan Eastern New Brunswick Area Gulf Region	English	Department of Fisheries and Oceans	Department of Fisheries and Oceans	2009	DFO
143	Online Publication	Sensitivities and Adaptation of Ecosystems and Sectors	English	Natural Resources Canada	Natural Resources Canada	2015/11/13	NRC
144	Book	Shediac Bay watershed Asset Management Plan	English	Mount Allison University	Jordan, P.	2000/06/22	MAU
145	Program	Shediac Bay Watershed Education Program	English	Mount Allison University	Jordan, P.	2000/06/22	MAU
146	Book	Development Options for the Community of Pointe du Chene	English	Mount Allison University	Jordan, P.	2000/06/22	MAU
147	Final Report	Shediac Bay Coastal Zone Sanitary Sewer Study Cap-des-Caissie to Cap-Bimet, NB	English	Mount Allison University & Crandall Engineering Ltd.	Crandall Engineering Ltd.	2000/01/14	

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
148	Final Report	An Assessment of Recent Shoreline Change and Flooding Hazard in the Coastal Region of the Shediac Bay Watershed	English	Mount Allison University	Ollerhead, J. & R. Rush	2000/03/15	
149	Final Report	Statement and Recommendations for Parlee Beach Pollution at Point-du Chene: The Quest for Resolution and Sustainability	English	The Red Dot Association of Shediac Bay	The Red Dot Association of Shediac Bay	2017/02/24	
150	Final Report	Environmental Risk Assessment Report GSSC (Scoudouc) Wastewater Treatment Plant	English	Greater Shediac Sewerage Commission & Crandall Engineering Ltd.	Crandall Engineering Ltd.	2013/03/01	ETF
151	Preliminary Report	Preliminary Environmental Risk Assessment GSSC (Shediac) wastewater treatment plant	English	Greater Shediac Sewerage Commission & Crandall Engineering Ltd.	Crandall Engineering Ltd.	2012/02/28	ETF
152	Evaluation Report	Shellfish Growing Area Annual Update Shediac River (NB-07-010-001)	English	Environment Canada Science & Technology Branch	Godin, P. & B. Richard	2013/09	ECCC
153	Evaluation Report	Shellfish Growing Area Annual Update Shediac Island (NB-07-010-003)	English	Environment Canada Science & Technology Branch	Godin, P. & B. Richard	2013/09	ECCC

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
154	Evaluation Report	Shellfish Growing Area Annual Update Shediac Harbour (NB-07-010-002)	English	Environment Canada Science & Technology Branch	Godin, P., Richard B., Richard, J. & J. Pomeroy	2015/08	ECCC
155	Evaluation Report	Marine Water Quality Re-Evaluation Report, NB Shellfish Growing Area NB-07-020-001, Shediac Bay Atlantic Marine Water Quality Monitoring Report Nr. ST-AR-2013-52.	English	Environment Canada Science & Technology Branch	Godin, P. & B. Richard	2013/12	ECCC
156	Evaluation Report	Évaluation de la zostère dans la baie de Shédiac (French only)	French	Shediac Bay Watershed Association	Donelle, R.	2020/02	SBWA
157	Evaluation Report	Augmentation de la Biodiversité dans la Ville de Shédiac – Rapport 2014-2015 (French version)	French	Shediac Bay Watershed Association	Hébert, J.	2016/03/31	SBWA
158	Evaluation Report	NBWTF Préservation d'une colonie de sternes pierregarin dans la baie de Shédiac – Rapport 2015 (version française)	French	Shediac Bay Watershed Association	Donelle, R.	2015/11	SBWA
159	Evaluation Report	Programme éducatif sur la conservation d'énergie et les changements climatiques	French	Shediac Bay Watershed Association	Association du bassin versant de la baie de Shédiac	2014/03/01	ETF

Ref. No	Document Type	Document Title	Language	Organization(s)	Author(s)	Document Date	Document Website
160	Evaluation Report	Programme de sensibilisation à l'efficacité énergétique et à la conservation de l'énergie	French	Shediac Bay Watershed Association	Paquette, J	2013/03/01	ETF
161	Evaluation Report	Concentrations de nutriments des eaux côtières du sud du Golfe du Saint-Laurent recueillis lors de l'échantillonnage du Programme de Surveillance de la Communauté Aquatique (PSCA) – 2006	French	Shediac Bay Watershed Association	Thériault, M. & S. Courtenay	2008/01	SBWA
162	Evaluation Report	SBWA – Rapport annuel 2002-2003	French	Shediac Bay Watershed Association	Association du bassin versant de la baie de Shédiac		SBWA
163	Evaluation Report	Shediac plan d'adaptation aux changements climatiques	French	Town of Shediac, Southeast Regional Service Commission & Shediac Bay Watershed Association	Commission de services régionaux Sud-Est		ETF

This list is not intended to be exhaustive, however provides a guide to the relevant documents and projects related to the Shediac Bay Watershed Management Plan (WMP).

GNB: a copy of the documents can be found on the Government of New Brunswick website.

SBWA: a copy of the documents can be found on the Shediac Bay Watershed Association website.

ETF: a copy of the Environmental Trust Fund Reports can be requested by email: ETF-FFE@gnb.ca.

ECCC: a copy of the Environment and Climate Change Canada reports can be requested at the Federal Science Library.