

# Clean Annapolis River Project



## 2017-2018 Year in Review

June 19, 2018

### Message from the Executive Director, Levi Cliche



Human impacts on the environment and the dangers they pose to ecological integrity and human well being are becoming more and more apparent every year. Researchers are discovering new information every day, often identifying new environmental threats or mechanisms by which known threats and predicted impacts are compounding. Major challenges such as plastics in the marine environment, climate change, and its derivative impacts like coastal and inland flooding, drought, ocean acidification, warming of ecosystems and species displacement are more and more present in the media and our social consciousness. It can be overwhelming, and often disheartening.

On the other hand, these impacts are becoming more difficult to dispute, and there appears to be a growing understanding that we are all affected, regardless of where we live, what sectors we represent in society, and what world views we hold.

Response to global environmental concerns is a growing part of worldwide intergovernmental discussion and policy development. The Paris Agreement, which came into effect in 2016, has been ratified by 178 parties around the world. The agreement sets a target to keep global temperature rise this century to under 2° Celsius, and recognizes the need to support global adaptation to the effects of climate change, undertake reductions in greenhouse gas emissions, provide transparent intergovernmental communication and public accountability on climate action, and to continue to adapt climate response according to emerging conditions and scientific information.

There is growing participation in environmental discourse and growing concern from industries that are not primarily focused on environmental issues. One example is the insurance industry's contribution to the climate change discussion, driven by observed upward trends in insurance claims made for flood and wildfire-related damages. Another is the fossil fuel sector, and the realisation that the need to move toward energy sources that reduce global carbon emissions will likely have negative financial impacts on companies and investors in that sector, as reserves of fossil fuels become effectively "stranded" as they become less marketable and their use becomes more restricted.

At a local scale, there is much happening that can help us adapt to environmental challenges and reduce our ecological impact. Municipalities are aware of many of the risks that climate change poses to our social, economic and environmental wellbeing, and have identified priorities to address these threats. There is a groundswell in local citizen action on issues such as sea level rise, ocean plastics, and species at risk stewardship. Industry stakeholders representing commercial fisheries, forestry, agriculture, and energy are willing participants in discourse and solution-seeking.

CARP has been striving to integrate our work with all of these processes at all levels in an effort to strengthen the collective impact that all contributors have within the Annapolis River watershed. We believe in an approach to ecosystem management that considers multiple values including social, cultural, economic, and environmental. We hold that finding environmental solutions that are sustainable in the long term is to include everyone in the process of defining those solutions, and

[www.annapolisriver.ca](http://www.annapolisriver.ca)





in carrying them out.

The severity and scale of the environmental impact our species has globally can seem overwhelming, but we can all contribute at a local scale. I am encouraged by growing discourse and action globally, and more locally, and find renewed inspiration to work toward surmounting our shared challenges. I sincerely hope that that hope is shared, and that you are inspired to act individually, as a local citizen, a stakeholder, and in partnership with groups like CARP toward an ecologically sustainable future.

## Message from the Board of Directors

Clean Annapolis River Project 2017-2018 Board of Directors:

Al Angrignon  
Bob Duff

Murray Freeman  
Mark Hebert

Orris Orlando  
Britt Roscoe

Bob Rowe  
Maggie Shackleton

Heather Stewart (new)  
Josie Todd

It has been a busy year for the nine volunteers that make up the CARP Board of Directors. In addition to the regular monthly meetings there have been numerous meetings of the Finance committee, Fund Development committee, Human Resources committee and the River Festival committee. As you can see the main focus of the Board is funding.

In any not-for-profit organization funding tends to be the number one concern and CARP is no exception. The Board and CARP staff have worked together finding ways to reduce expenses and increase revenue. We have had some success but there is still work to be done. We are very excited about the Community Interest Company (CIC) which will be able to provide a variety of environmental services to the community while allowing the profits to be turned back to CARP. These funds can be used to cover core expenses and sustain various projects.

The year end review clearly shows the wide range of projects being carried out in the watershed and the level of community engagement. It is encouraging to see the number of volunteers and the age range of the volunteers. Connecting residents of the watershed to the watershed is an important part of the stewardship process.

The River Guardians program is a prime example of the problem we face with our current funding model. After 27 years the River Guardian program which samples the river water and measures E.coli concentration, has not been able to secure funding for sampling this field season. This is valuable data and the program should continue but CARP does not have discretionary funds to support the program. The current funding model determines what work we can do not necessarily the work that is most important. We hope the CIC will help address this problem.

We have an excellent CARP staff, CARP Board and working relationship between the two. This winning combination and continued community support allows CARP to be a leader in community based environmental science.

Last year at the AGM I had my three cue cards with "Annapolis River", "Ours To Enjoy", "Ours To Protect" and I see that happening. The improved river access at Bridgetown and Annapolis Royal has resulted in a noticeable increase in boating, fishing and swimming. Not only Annapolis County residents but people from Kings County and Digby County have enjoyed the cruise between these two points. At least one Kings County boater made the trip three times. A livestock fencing project in the Bridgetown area has been noticed and praised by many people and recognized as part of the good work done by CARP. People are frequently reporting turtle sightings and the volunteer help has been impressive. People are becoming more concerned and more involved. Every cause needs a champion and for the Annapolis River CARP is that champion. With your continued support things can only get better.

Sincerely,  
Murray Freeman

[www.annapolisriver.ca](http://www.annapolisriver.ca)



## Support for Education and Training

As a community-based organization, CARP strives to create opportunities to provide education and training to local students, young professionals and partner organizations. During the 2017-2018 program year this included:

- 2 Nova Scotia Clean Leadership Internships
- 1 Canada Summer Job position
- 2 Agri Canada Green Internships
- 1 Eco Canada Internship
- 3 high school co-op placements
- 3 Center of Geographic Science work term placements
- 3 Duke of Edinburgh Award students completing skills and volunteer service components
- 12 local students engaged in service learning projects
- 5 Options to Opportunities classes (Digby, Annapolis, Bridgetown, Middleton, West Kings) engaged in service learning projects
- Participation in the Center of Geographic Science Industry Expo
- Field training provided to summer staff with the Jijuktuk'wejk Watershed Alliance
- Fish habitat assessment training course organized with the NLSC Adopt A Stream program

## Public Outreach

In the 2017-2018 program year CARP was involved in over 100 public outreach programs, meeting over 4300 people in the process. This includes special events, activities and presentations organized by CARP, as well as guest presentations at other community events.

In June 2017 CARP partnered with Champlain Elementary School for a second year to offer a full week of enrichment programming for all students in all grades. This week included field trips to First Lake to explore the topics of forestry, water quality, wildlife, and wetlands, and a trip to the Annapolis Basin Marsh for critter dipping, birdwatching, and outdoors games.

Whenever possible we aim to fulfill teachers' requests to have CARP work with their students. This has led to several exciting special projects over the last year. Students from Lawrencetown Education Center are working to build cold frames as part of their entrepreneurship project. Some of these frames will be used by CARP to support ongoing projects and additional frames are for sale to community members. Students have also been starting and tending to seedlings to be used in rain gardens for our *Soaking Up Stormwater* project.

Students in the Middleton Regional High School O2 program have been working to restore the gardens at Riverside Park in Middleton, so that they can be replanted with pollinator friendly species and add to the aesthetics of their community. This class is also building rain barrels and has assisted with wood turtle visual surveys this year.

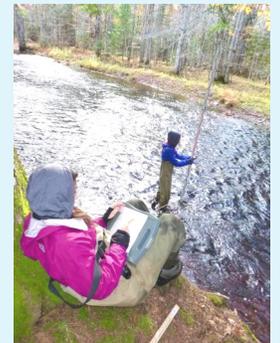
We are also working to find overlaps between our work and other community interests. There is a great deal of interest in climate change impacts and sea level rise in the Annapolis Royal community, so in April 2017 a guest presentation by Dr. Tim Webster of the Applied Geomatics



Students in AWEC Oceans 11 examining haddock stomach contents



Students from BRCS tree planning in our new riparian buffer



AWEC students conducting fish habitat suitability assessments



CES students critter dipping at the French Basin Marsh



Research Group was organized to catch everyone up to speed on some of the work that has been done to model flood risk in the Town of Annapolis Royal. In order to support the *Landbird Species at Risk in Forested Wetlands* project, led by Dr. Cindy Staicer at Dalhousie University, a series of three public workshops were hosted, which has led to a contingent of volunteers supporting field activities for this project. CARP is also working to support initiatives led by partner organizations such as the Mersey Tobeatic Research Institute and Bird Studies Canada.

## Annapolis River Festival

On June 15, 2017 CARP hosted the third *Annapolis River Festival*. This event was developed as CARP's major fundraiser and thanks to the dedication of an army of volunteers, the Festival has continued to grow in its success. Highlights from 2017 included:

- 1700+ festival attendees
- 457 participants in water-based activities, including dragon boat races, canoe races, and boat tours
- 120+ community event volunteers
- Over \$36,400 raised for Clean Annapolis River Project

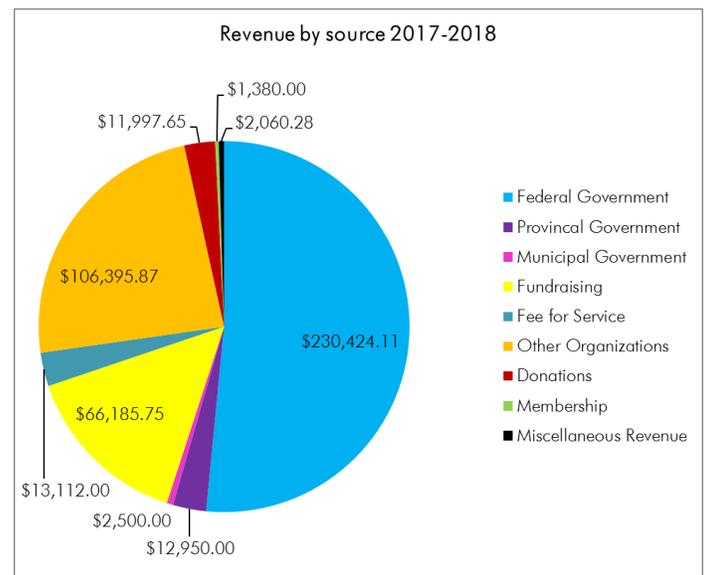
The fourth annual Annapolis River Festival will be held Saturday July 14, 2018 at Jubilee Park in Bridgetown, Annapolis County. We hope to attract over 2000 visitors to the park and have been working to ensure a Festival schedule that appeals to everyone. An exciting new addition includes a free petting farm to help keep families entertained and an improved assortment of food and drink options available throughout the day.



## Organizational Funding

Securing funds to sustain CARP's work is an ongoing challenge. Most of the organization's funds come in the form of project specific grants, which set out strict limitations. The chart below illustrates the sources of revenue for the 2017-2018 program season.

CARP has been actively seeking options for diversifying funding and ensure more sustainable funding. One of the options we are pursuing is the development of the Community Interest Company. *Integrated Ecosystem Solutions (IES) CIC* will be among the first Community Interest Companies (CIC) registered in Nova Scotia. A CIC is a hybrid between a for-profit business and a non-profit organization, combining the ability to generate a profit with support for a community benefit. Integrated Ecosystem Solutions will offer a variety of environmental services and products, similar to those offered by environmental consultants, and invest back into the community through the financial support of Clean Annapolis River Project and their various partner organizations.





## Project Highlights

### Soaking Up Stormwater

#### Project Overview:

Stormwater is the term for water that originates during precipitation events and snow/ice melt. Stormwater can soak into the soil (infiltrate), be held on the surface and evaporate, or runoff and end up in nearby streams, rivers, or other water bodies (surface water). With an increase of impermeable hard surfaces such as roofs, parking lots, driveways, sidewalks, and roads, stormwater is becoming a greater issue in our built landscapes. As surface water moves across the landscape it can collect harmful substances along the way, transporting them into our storm sewers or directly into natural waterways. We are working with the Bluenose Coastal Action Foundation to address the issue of stormwater runoff in Southwest Nova Scotia by utilizing low impact development (LID) techniques to soak up stormwater. Examples of LIDs include rain gardens, bioswales, dry creek beds, tree planting, depave events, and rain barrels. The project will also provide ongoing support and education through presentations and meetings to local communities, schools, and municipalities on how to properly manage stormwater on their properties and ways to conserve water.

#### 2017 Highlights:

- A home water audit was developed concentrating on water conservation and stormwater management in and on homeowner properties. The assessment was targeted to students, but could be completed by any member of a household. The purpose of the home water audit was to determine how much water individuals and families were using in their homes, along with how well stormwater was being managed on properties. A total of 86 audits were completed with more to be retrieved;
- 653 seedlings were planted on a floodplain site located in Middleton, Nova Scotia in hopes to uptake some of the stormwater and prevent downstream erosion and flooding in the area;
- Numerous site assessments were conducted, and a public demonstration rain garden occupying 21m<sup>2</sup> was constructed in Digby, Nova Scotia with planting carrying forward into Spring of 2018.

#### Future Directions:

Throughout 2018, additional site assessments will be conducted to determine suitable sites to construct additional LIDs. At least 1200 m<sup>2</sup> of stormwater will be diverted as a part of an LID project in Digby, Nova Scotia. Six rain gardens ranging from 19-28m<sup>2</sup>, along with dry creek beds and bioswales will be constructed at this site.



This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada



RBC  
Blue Water  
Project™



[www.annapolisriver.ca](http://www.annapolisriver.ca)





## Fish Passage Restoration and Habitat Enhancement

### Project overview:

While threats to fish populations are numerous and diverse, degradation of freshwater habitats remains the most significant contributor to the observed declines in species. Much of this habitat loss has been attributed to modifications of the physical environment by human land-use impacts. Habitat fragmentation, a key contributor to habitat loss, is considered a significant threat to fish populations worldwide. Watercourse alterations through human activities, such as the construction of watercourse crossings, have the potential to significantly affect the ecological integrity of aquatic ecosystems.

Watercourse crossings that are poorly designed, installed incorrectly, or lack regular maintenance can become barriers to fish passage. In addition to habitat fragmentation, other threats to fish populations include in-stream habitat loss through channel modification, sedimentation, and alterations to water quality. In order to address these threats to freshwater habitats within the Annapolis River watershed, CARP has built upon its ongoing fish habitat restoration program (formerly "Broken Brooks") through a multi- Clean Annapolis River Project 2016-2017 Year in Review 9 faceted and deliberate approach using sub-watershed management plans. The project has evolved to include aquatic connectivity assessments, targeted habitat quality and connectivity restoration, and consultation with partners and stakeholders. By taking this approach, CARP has implemented varied restoration and enhancement actions in watercourses supporting significant recreational fisheries.

### 2017 Highlights:

- 10 culverts received restoration work, which included the installation of 7 tailwater control weirs, 1 low-flow barrier, 10 baffle pairs, 4 fish chutes, and the removal of 7 debris piles. These remediation activities restored access to 18.77 km of upstream habitat for native fish species
- Including the 8.55 km of upstream habitat passage improved in the year 2016 and the work completed in 2017, a grand total of 27.32 km of enhanced fish passage conditions have been restored through this project since the projects goals were remodelled and updated in 2015
- 1.65 km<sup>2</sup> of potential spawning habitat in the Fales River was enhanced through the process of sandwanding, removing fine, compacted sediments in the streambed
- 5 double digger logs with deflectors were installed in the Black River spanning a length of 365m and assisting in restoring 3.285 km<sup>2</sup> of in stream habitat. These digger logs will support upstream riffles and create downstream pools, therefore enhancing both trout and Atlantic salmon spawning, rearing, and migration habitats

### Future directions:

In the year 2018, the project will continue the improvement of habitat connectivity and instream habitat restoration within the Annapolis River watershed. The fish habitat connectivity of several watercourse crossings will be surveyed as well as their barrier status determined and these results will be recorded on the new, web-based Aquatic Connectivity Analytical Database (ACAD). Continued improvement and restoration actions that target barrier watercourse crossings, specifically



the passage of fish through culverts, will be addressed with the goal of providing 5 km of newly accessible upstream habitat. Instream habitat restoration work will also be undertaken with continued sandwanding actions in the Fales River and the removal and repositioning of digger logs and deflectors in both the Fales River and the South River.



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada



## Aquatic Connectivity Analytical Database

### Project Overview:

Aquatic habitat connectivity refers to a network of streams and rivers in a watershed, and how accessible the habitats within that network are to fish and other organisms. In 2014, CARP began working with the Adopt-a-Stream program to develop a province-wide database that will provide a tool for housing provincial watercourse crossing data from community groups. The database has been continually improved throughout its development as the aquatic connectivity program has been adapted to make data collection and watercourse crossing assessments more effective.

### 2017 Highlights:

- The Aquatic Connectivity Analytical Database (ACAD) was launched in April 2018 after several years of development and can be accessed online at: <http://culverts.speciesatrisk.ca/>
- ACAD is an online database that stores culvert assessment data, analyzes data for potential barriers to fish passage, and produces reporting outputs based on the results for 6 species: brook trout, American shad, alewife, American eel, rainbow smelt, Atlantic salmon



### Next steps:

The ACAD will be used by community-based conservation groups that are assessing road-watercourse crossings for barriers to fish migration using the NSSA's NSLC Adopt A Stream assessment protocols, training, and support through their Aquatic Connectivity Program.



## Wood Turtle Monitoring and Stewardship

### Project Overview:

The overall goal of the Wood Turtle Monitoring and Stewardship project is to ensure the long-term persistence of the wood turtle and its habitat in the Annapolis River watershed. Project objectives in 2017 included: monitoring the movement patterns and distribution of wood turtles in the watershed through the use of radio telemetry; assessing habitat use by sub-populations in the Annapolis river watershed; implementing an outreach program to engage communities within the watershed to create awareness and promote education about the ecological needs and importance of the wood turtle; recruiting, training and re-training volunteers in project activities, in order to build organizational capacity and develop a skilled and engaged volunteer base; engaging landowners and stakeholders in the development and adoption of stewardship activities tailored to land uses around confirmed wood turtle habitat in the watershed; and providing support for province wide recovery initiatives.

### 2017 Highlights:

- Twenty-three visual surveys conducted with a total of 204.73 hours of effort (171.3 hours volunteer effort)
- Twenty-nine radio telemetry surveys conducted with a total of 221.75 hours of effort (181.33 hours volunteer effort); four individuals tracked using radio telemetry;
- 11 individual wood turtles observed through visual, nesting and radio-telemetry surveys
- Two nests successfully protected
- Five new stewardship plans developed for private landowners

[www.annapolisriver.ca](http://www.annapolisriver.ca)





- Over 500 individuals engaged in project activities including outreach events and field activities
- New public signage designed, and four signs produced to help raise awareness about native freshwater turtles and to encourage reporting of species at risk;
- Ongoing participation in the provincial Wood Turtle Recovery Team and other regional species at risk recovery initiatives



Future Directions:

CARP has applied for grants to support the continuation of this work in the 2018-2019 project year. The project will continue to emphasize the engagement of volunteers to support field activities. This project creates great opportunity for educational programs, and CARP will continue to involve schools and community organizations in field surveys. Surveys will focus on expanding the confirmed range of wood turtles in the Annapolis River watershed.

As the only NGO in Nova Scotia with a robust wood turtle program, CARP will continue to support efforts of the Provincial Recovery Team by providing training and support to other organizations and partners such as the Jijuktuk'wejk Watershed Alliance. CARP is a leader in stewardship planning on private lands and will continue to support the conservation and recovery of the wood turtle and other species at risk on private lands.

This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



## Ocean Acidification

Project Overview:

The ocean, once considered a good carbon sink for the absorption of worldwide CO<sub>2</sub> emissions resulting from human activities, has been shown to be experiencing rapid changes in seawater chemistry from absorption of CO<sub>2</sub>. The weak acid nature of CO<sub>2</sub> results in a release of protons (H<sup>+</sup>) into seawater, increasing its acidity. Rapid changes in the acidity of coastal and marine waters can have devastating effects on aquatic habitats and biodiversity. While there has been much study into ocean acidification, less is understood about coastal acidification in estuaries. Coastal acidification in estuarine and near shore environments is influenced by a complicated set of relationships, and can be affected by a wide variety of factors such as:

- nutrient loadings and nutrient cycling processes from watersheds,
- the underlying geology and landform structures in watersheds and estuaries,
- metabolic activity in intertidal sediments,
- the amount of freshwater and marine water exchange happening within an estuary or near shore environment.



2017 Highlights:

- In order to better understand the relationships affecting coastal acidification, CARP has partnered with Eastern Charlotte Waterways and Dalhousie University on a three-year project to study the vulnerability of estuaries and near shore environments within the Bay of Fundy to coastal acidification. The study is also aiming to complete a baseline assessment of changes in coastal acidity levels in the near shore and estuarine areas of the Bay of Fundy
- Sampling was initiated in 2016 and continued in the 2017 field season with the collection of monthly acidification water samples throughout the winter, spring, summer and fall, and collection of radium samples in the late summer





Next steps:

Sampling will continue through 2018 with analysis and reporting planned for winter 2018-2019. Dr. Helmuth Thomas at Dalhousie University will lead the analysis component of the project.



## Annapolis River Guardians

Project Overview:

The Annapolis River Guardians program, an extensive volunteer-based water quality monitoring program, is CARP's longest running project and has contributed to the collection of over 27 years of data on the Annapolis River. The program was initiated in the early 1990's by Dr. Graham Daborn and the late Dr. Mike Brylinsky of the Acadia Centre for Estuarine Research, with the intent of providing a long-term record of the river's health and an early warning for environmental problems. Since its inception, over 150 volunteers have participated in the program, and more than 4,500 water samples have been collected and analyzed.

2017 Highlights:

- 3 volunteers helped to collect over 64 water samples for further analysis from the months of May through to September. Due to a lack of funding for the program, volunteer engagement and the number of samples collected were reduced for the 2017 season
- Parameters measured: conductivity, pH, total dissolved solids, turbidity, dissolved oxygen, and water and air temperatures
- All parameters except E. coli fell within acceptable ranges for human use;
- E. coli levels were 'Unacceptable for Recreation', scoring higher than 200 cfu/100L

Future Directions:

CARP is currently seeking sponsors and partners in order to secure the financial resources required to run the program. The River Guardians program will continue in 2018 with a shortened sampling season. It was anticipated that no bacteriological sampling would take place in 2018, but a donation from Hamilton Eel Fishery in June 2018 will allow this sampling to take place for the remainder of the season.

## Restoration and Enhancement of Wetlands in Working Landscapes

Project Overview:

The Restoration and Enhancement of Wetlands in Working Landscapes project aims to restore and enhance the ecological health of wetland habitats found on agricultural landscapes in and around the Annapolis River watershed. Agriculture is the predominant land use in the watershed, and has resulted in significant loss of wetland habitats in and adjacent to pasturelands, forage, and crop fields. This project builds on the strong partnerships developed through CARP's Agri-Stewardship project to implement actions that will seek to enhance/restore wetland habitats on working landscapes where they have been in-filled, cleared, drained, or otherwise lost and/or degraded. Restoration and enhancement includes activities such as exclusion fencing to restrict livestock access to wetlands, planting of wetland species to enhance degraded areas, and removal of invasive plants. The project also seeks to identify and evaluate potential wetland restoration sites using remote sensing, geospatial analyses, and in-field delineation surveys. The project relies on the assistance and expertise of partners such as the Centre of Geographic Sciences (COGS), the Applied Geomatics Research Group (AGRG), the Nova Scotia Department of Natural Resources,



[www.annapolisriver.ca](http://www.annapolisriver.ca)





Nova Scotia Eastern Habitat Joint Venture Stewardship Program, and the wetland delineation assistance from an independent certified individual and expertise from East Coast Aquatics.

### 2017 Highlights:

- Baseline functional assessments for five selected properties within the Annapolis River watershed. Detailed stewardship plans were developed to guide subsequent restoration and enhancement activities on those properties in years one and two of the project;
- Partnered with COGS and AGRG to collect geospatial data and develop a GIS model for identifying and ranking 15 additional sites with strong restoration potential in the Annapolis River watershed;
- Erected 400 metres of agricultural fencing;
- Planted 400 wetland plants;
- Removed approximately 2,800 kilograms of invasive roses to enhance over 0.5 hectares of wetland habitat spanning two different sites;
- Identified and delineated 0.25 hectares of wetland habitat to be restored through excavation in year two of the project.



### Future Directions:

Stewardship plans developed during the first year of the project will be used to guide restoration and enhancement actions in year two. During the 2018 field season, CARP will erect 400 meters of fencing and plant 400 wetland plants to enhance approximately 0.5 hectares of wetland at two separate sites. CARP will also excavate a shallow pond to restore approximately 0.25 hectares of wetland located at a third site. Finally, CARP will use the GIS model developed in collaboration with COGS and AGRG to identify and evaluate 15 additional sites with strong restoration potential for any future wetland restoration work to be undertaken in the Annapolis River watershed.



This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



## Livestock exclusion fencing and riparian zone restoration and enhancement

### Project Overview:

Clean Annapolis River Project (CARP) set out to address cattle access on a prevalent pastureland in an area of the Annapolis river that sees significant public usage for boating and swimming. The property in Bridgetown has been used as pasture for more than 50 years and has recently become a communal pasture for more than 50 animals each year. The result of the large number of animals is directly related to increased erosion, nutrient run off, and silt pollution in the river.



### 2017 Highlights:

- 2.38km of fence was installed with a protected riparian area of over 30,000m<sup>2</sup>;
- 950 saplings of varying indigenous species were planted in the riparian buffer;
- 2 manual nose pumps were installed to provide an alternate water source for livestock.

### Future Directions:

This project was completed in 2017, however, there are many sites where similar work can be conducted within the Annapolis River watershed. Additional planting and willow staking will be



[www.annapolisriver.ca](http://www.annapolisriver.ca)





conducted in the riparian buffer in 2018 by student volunteers and members of CARP's Youth Leading Environmental Change program.



Fisheries and Oceans  
Canada Pêches et Océans  
Canada

## Estuary Monitoring

### Project Overview:

An estuary of the Bay of Fundy, the Annapolis estuary is a unique and complex environment where the freshwater from the Annapolis River and its tributaries mix with the incoming tidal saltwater. Relatively little information has been collected to date about its health, and that is a topic that CARP has begun investigating more closely as part of studies geared at assessing land-based impacts to the estuary. Beginning in 2016 Eastern Charlotte Waterways and CARP have been collecting data about nutrient levels and fecal contaminants in selected estuaries in order to gain a better understanding of current baseline conditions and to develop a long term health record.

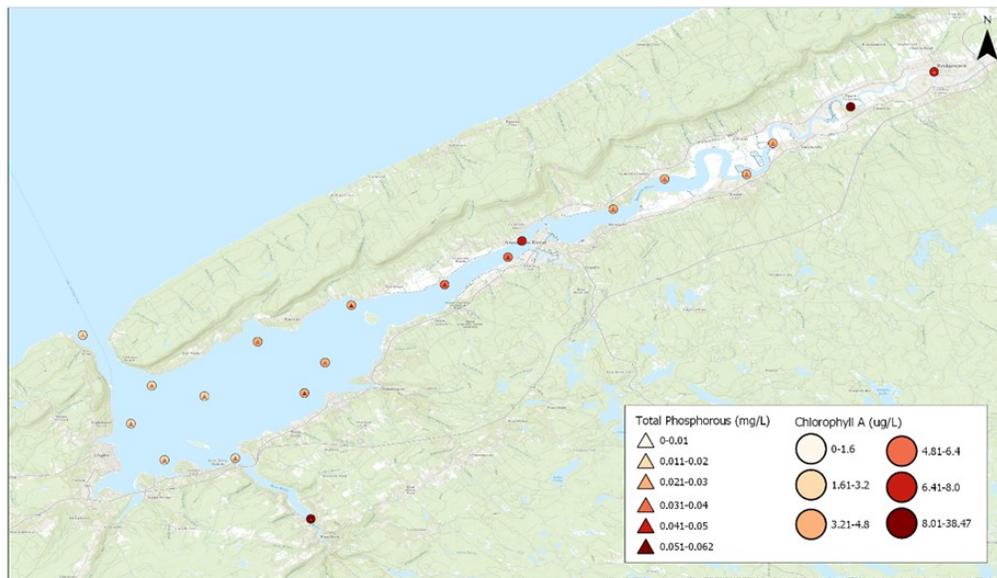
### 2017 Highlights:

- Data from the 3 years of sampling analyzed to assess nutrient levels and fecal contaminants
- Maps have been created showing the results of phosphorus and chlorophyll A sampling
- Priority areas for follow-up monitoring identified; in the Annapolis estuary this includes Bear River and the Bridgetown areas

### Next Steps:

2017 marked the final year of the Estuary Monitoring project. CARP and ECW are working to identify funds for continued work and grants have been applied for to conduct monitoring in priority areas to identify pollution sources, and to establish a demonstration site for reduction of nutrient contamination from an agricultural operation using a tile drain control.

**Annapolis Basin**  
Mean Value of Chlorophyll A & Total Phosphorous Concentrations 2015-2017



0 10 20 Kilometers

This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada



[www.annapolisriver.ca](http://www.annapolisriver.ca)





## Youth Leading Environmental Change

### Project Overview:

Youth Leading Environmental Change is a free program that engages youth throughout the Annapolis River watershed in environmental education, stewardship actions and leadership development training. Youth have the opportunity to learn how landscape features and functions impact human and environmental health, as well as community wellbeing. Participants reinforce their understanding of these concepts and apply them through a variety of environmental restoration and stewardship activities that will positively impact their community and the health of the ecosystem. CARP launched the YLEC program in 2016, and while there is always room for improvement, it has been a great success in terms of engaging youth ambassadors in stewardship and conservation activities.

### 2017 Highlights:

- Activity sessions covering topics such as: wood turtle monitoring, Atlantic sturgeon egg sampling, pollinator gardening, sampling fish using beach seines and fyke nets, fish habitat assessment, barrier culvert remediation, storm water management, benthic invertebrate identification and more
- The development and delivery of a presentation to Annapolis County Council outlining the major issues of concern and potential ways forward
- Participation in the Annapolis Royal Natal Day parade using litter collected beach clean ups to highlight the issue of plastic pollution in coastal and marine habitats
- Support for outreach programs such as Wood Turtle Day at Oaklawn Farm Zoo and the delivery of public presentations about wood turtle stewardship at local libraries
- Additional volunteer support provided outside of the YLEC program for CARP projects including fish habitat suitability index assessments, beach clean ups, and wood turtle monitoring activities

### Next steps:

CARP hopes to continue offering the program and partial funding has been received to support the program in 2018-2019. CARP has opened registration to 40 students and is working to find youth to represent communities from across the watershed. Activities commenced in May will continue through October. Past program participants were surveyed to assess their areas of interest, and youth identified that they would like to find additional opportunities to engage the broader public in order to share their knowledge and experiences. The relationships developed through this program has allowed CARP to provide additional support to students by hosting co-op students and supervising service hours for class credit and the Duke of Edinburgh Award.

Active Kids Healthy Kids



[www.annapolisriver.ca](http://www.annapolisriver.ca)





## Integrated Management Planning for the Annapolis River Watershed

### Project Overview:

CARP has been successful in receiving funding through the Community Foundations of Canada's Community Fund for Canada's 150th for a project titled Integrated Management Planning for the Annapolis River Watershed. This project involved the initiation of a consultation and strategic planning process that will link CARP's organizational planning to components of the County of Annapolis' Economic Development Strategy, most notably the 2050 target to "reduce, remediate and manage contamination of Annapolis County land, air and water".

### 2017 Highlights

- Three public consultation meetings in three locations in Annapolis County in order to identify community members values related to land and water resources and to identify the threats perceived to be of greatest concern.
- Two consultation and strategic planning meetings with identified stakeholder groups in Annapolis County. Focus areas included forestry and freshwater resources.
- Project results were presented at the Bay of Fundy Ecosystem Partnership Science Conference in Truro, and the Communities, Conservation and Livelihoods Conference at Saint Mary's University

### Next Steps:

A final report summarizing the results of community and stakeholder meetings is being drafted and will be released in 2018. The outcomes of these meetings will act as a starting point for continued strategic planning in partnership with the Municipality of the County of Annapolis and other key stakeholders.



Canada



## The Maritime Natural Infrastructure Collaborative

### Project Overview:

Ecosystem services are services that come from nature and benefit people. For example, wetlands provide us with water purification, recreation, and flood risk reduction services simply by performing its natural functions. Consideration of ecosystem services in land use planning can help enhance the net benefits of our land use decisions, as these services provide low cost benefits that increase our preparedness to the impacts of climate change through enhanced community resilience. This project aims to broadly enhance the conversation about ecosystem services and values, especially among land use decision-makers, with particular emphasis on climate change induced inland flooding. Ultimately, the project proposes a hands-on, practical approach that has grown out of a need to address inland flood risk through well-informed decisions and real action.



The primary goal of this project, which is being led by Nature New Brunswick, is to develop tools that will help decision makers integrate ecosystem services into land use decisions. These tools are being developed and tested in New Brunswick, Nova Scotia, and Prince Edward Island. The tools will include information on how to identify, measure, and value ecosystem services in particular sites using various models, including InVEST, and new inland flood risk models being developed by the Université de Moncton. By incorporating all of these tools into one methodology, we aim to provide planners and



[www.annapolisriver.ca](http://www.annapolisriver.ca)





decision makers with a simple and scientifically sound approach for assessing land to help preserve flood risk reduction services.

**Project Highlights:**

- The Moose River Subwatershed was selected as a study site for the project; existing data for this area was provided to project partners
- A public meeting and interviews were conducted to collect local knowledge about the Moose River area and all data was provided to support the Moose River case study

**Next Steps:**

Project partners, including Nature New Brunswick, are working to complete case study analysis. Results of the project will be released to the public in 2018.



This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

**2017-2018 additional special project and outreach funding provided by:**



## Future Opportunities

### Atlantic Canada Marine Microplastics Research Project

The Atlantic Canada Microplastic Research Project, led by Bluenose Coastal Action Foundation, is a partnership aimed at addressing the environmental problem of marine plastic pollution, specifically microplastic (<5 mm in diameter). The project is an ecosystem-based research initiative that will quantify microplastic distribution and concentration across three locations in Atlantic Canada; the Bay of Fundy, the Bay of Islands (i.e., Gulf of St. Lawrence), and the LaHave River Estuary (i.e., Atlantic Coast).



The project will include two years of microplastic sampling and analyses within the three study areas. Samples will be collected from surface water trawls and benthic sediment grabs to quantify microplastic particles and determine concentrations. The culmination of the proposed project will be an international workshop event to share and discuss results of microplastic data with researchers, scientists, non-government organizations and students. This project is in partnership with Clean Annapolis River Project (Annapolis Royal, Nova Scotia) and ACAP Humber Arm (Corner Brook, Newfoundland). Max Liboiron from Memorial University in St. John's, Newfoundland will assist with sampling protocol and procedures as well as conduct lab analysis of the collected microplastic.



This project was undertaken with the financial support of:  
Ce projet a été réalisé avec l'appui financier de :



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

[www.annapolisriver.ca](http://www.annapolisriver.ca)





## Seeds to Soup

The Seeds to Soup project supports the implementation of key recommendations in Nova Scotia’s Healthy Eating Policy (2005) by taking action to address food insecurity, improve food literacy among youth, and improve access to fruits and vegetables. Drawing on the knowledge and experience of partner organizations and individuals within the community, the project will create opportunities for intergenerational knowledge transfer and mentorship in order to achieve three objectives: (1) Increased food autonomy and access to fresh fruits and vegetables among residents of the Annapolis River watershed as the result of a Lawns to Gardens initiative that will provide food insecure individuals with the resources and capacity to grow fresh produce at home; (2) Increased food literacy and local capacity to grow and prepare healthy foods as a result of training and support programs, including a series of public workshops and in-class programming for students; (3) Increased supply of healthy food options available to at-risk community members through local food distribution programs as the result of a food preparation program delivered in partnership with local students. After receiving food literacy education and food preparation skills training, students will process and prepare locally supplied produce for distribution to food insecure households at their school and at the local food bank.



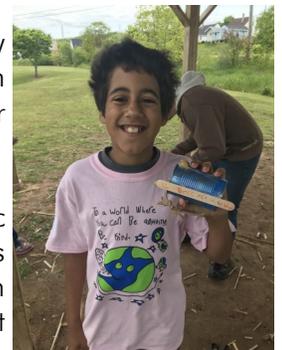
CARP has received partial funding for this project, which will launch in June 2018.



## Annapolis Change Makers

The Annapolis Changemakers project supports CARP’s engagement of community members by creating and supporting opportunities for citizens in the watershed to actively participate in monitoring, conservation and restoration actions that address environmental threats to their communities.

The environmental issues addressed through this project have been selected based on public consultation, to ensure they reflect key areas of concern for community members. These issues include: (1) water quality degradation in the Annapolis River, (2) surface water pollution from stormwater run off, (3) species at risk conservation and monitoring, (4) migratory fish habitat fragmentation and (5) coastal and marine litter.



Through activities such as wildlife surveys, rain garden construction, and beach clean ups, the Annapolis Changemakers project will allow CARP to support community members in taking action to address environmental issues.

One of these initiatives includes a series of beach clean ups which commenced on May. Beach clean ups are scheduled for every other Sunday at locations across the watershed. Details are available on the CARP website at [annapolisriver.ca/cleanup](http://annapolisriver.ca/cleanup).



# The Annapolis River



OURS TO ENJOY,  
OURS TO PROTECT