

## Clean Annapolis River Project: 2015-2016 Year in Review

### Fish Habitat Restoration

#### Goals/Objectives:

The Fish Habitat Restoration Program includes a number of complimentary projects that support the restoration and enhancement of freshwater ecosystems in order to improve habitat quality for several native species, including brook trout and Atlantic salmon. Fish habitat restoration activities included the implementation of restoration actions identified from both watercourse crossing assessments conducted beginning in 2010 as well as from the sub-watershed plans developed since 2012. Restoration actions included the use of methods such as wing deflectors, boulder cluster placement, digger log installation, and installation of other instream habitat structures to improve instream habitat quality in targeted subwatersheds.



In order to address habitat fragmentation caused by previously identified barrier culverts, fish passage remediation actions were completed. These actions included the installation of tailwater control structures, baffles, and outflow chutes.

#### Highlights:

##### Nictaux River Sub-watershed

A restoration management plan was completed for the Nictaux River sub-watershed by CARP in 2013. Some excavator work, including the reconstruction and bolstering of degraded rock weir structures, was initiated on the Nictaux River in 2014 to improve habitat complexity and productivity for salmonids. This work was continued in the 2015 field season with the completion of adjustment work on three of the rock structures where reconstruction work began in 2014, and with the reconstruction and bolstering of three additional new weirs in 2015. Additionally, four deflector weirs and a double digger log were installed using hand tools by CARP staff and volunteers downstream of the rock weirs.

#### Project Funders:



Fisheries and Oceans Canada  
Pêches et Océans Canada



##### Fish Passage Restoration and Habitat Enhancement

- Forty-five culverts were shortlisted for potential restoration based on their outflow drop, slope and upstream habitat gain. These selected culverts were re-visited to determine feasibility of remediation activities;
- Fifteen sites received restoration work, which resulted in the completion of 6 debris removals and 10 tailwater control restorations;
- Access to 33 km of upstream habitat was restored, and



access to an additional 13.7 km was improved as a result of restoration actions;

- Seven custom-made galvanized steel chutes were installed in conjunction with rock weirs to address outflow drops up to and greater than 40cm;
- Eastern cedar posts (sized 3x3's and 5x5's) were installed as baffles or low flow barriers in six culverts as part of restoration activities.

#### Next Steps:

Future fish habitat restoration work will include further implementation of actions recommended in sub-watershed management plans developed by CARP for systems including the Nictaux, Moose and South rivers. Habitat fragmentation remains a prolific issue across the watershed, and future work will address additional barrier culverts.

#### Project Funders:



Fisheries and Oceans Canada  
Pêches et Océans Canada



NSLC  
adopt  
a stream

### Striped Bass Research and Outreach

#### Goals/Objectives:

The overall research goal for this project was to collect information about striped bass in the Annapolis River Watershed. Three objectives were set to achieve this goal: to conduct egg tow surveys at known historical spawning sites on the Annapolis River; to conduct beach seine surveys at sites on the Annapolis River and estuary, Bear River and Allain's Creek; and to conduct a variety of outreach activities to encourage submission of recreational angler catch data and scale samples, and to raise general awareness about the project.

#### Highlights:

- No striped bass eggs were collected during the 36 egg tows that were conducted during the 2015 field season. This is similar to 2014, where no eggs were collected during surveys;
- No juvenile or adult striped bass were collected during beach seine surveys ;
- A variety of forage fish were collected during beach seine surveys, with a total of 4742 individual fish collected, representing 17 species from 13 families, indicating that availability of prey is likely not a limiting factor for striped bass;
- Surveys conducted on the Annapolis River, Bear River and Allain's Creek in 2015 yielded no evidence of the presence of striped bass eggs or juvenile fish. Anecdotal evidence from recreational anglers indicates that migrant adult fish still access these waterways. This supports DFO's (2014) conclusion that the Annapolis River spawning population is extirpated, but that the river still acts as foraging and/or overwintering ground for migrant adults.

#### Next Steps:

Field sampling conducted through the Striped Bass project was a component of a larger research initiative by the Striped Bass Research Team and Acadia University. The 2015 field season marked the final year of field data collection in the Annapolis River watershed (Annapolis River, Allains Creek, Bear River). All data has been submitted to the Striped Bass Research Team, to support their ongoing research projects.

The CARP office will continue to act as a Striped Bass Stewardship Center, where recreational anglers can pick-up and submit angler kits, which include log books, scale sample envelopes, and additional resources about the Striped Bass Research Team's various initiatives.

**Project Funder:**



## Wood Turtle Monitoring and Stewardship

**Goals/objectives:**

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 2015 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.

**Highlights:**

- 18 individual turtles were observed through visual surveys, nesting surveys, radio-telemetry, or incidental to radio-telemetry; four of which were first captures.
- Four turtles were radio-tracked during the 2015 field season. Two of the turtles tracked were females identified through visual surveys. Transmitters remained equipped to these turtles throughout the overwintering period
- Five turtles were observed making nest attempts, and four nesting events were observed. These nests were subsequently protected and monitored. Three of the four nests resulted in successfully emerged, live hatchlings. In total 21 hatchlings were notched and released at their respective nesting sites.
- Five new stewardship plans were developed in consultation with private landowners in Aylesford, Meadowvale and Paradise
- Volunteers contributed over 475 hours to field surveys, including radio-telemetry, visual surveys, nest surveys, and emergence surveys;
- A variety of public education and outreach activities were conducted, engaging over 200 members of the public, including group field surveys, classroom presentations, school field trips, and family events

such as “Wood Turtle Day” at Oaklawn Zoo, and “Breakfast with Wood Turtles” with the Paradise Active Healthy Living Society

#### Next steps:

This project will continue in 2015-2016, building on previously conducted data collection and stewardship actions. Additional landowners/managers will be sought for the development of Stewardship Plans. There will be an increased focus on developing volunteer capacity for field activities, in order to ensure the project remains financially viable. During the 2016 field season visual survey efforts will focus on expanding the confirmed range of wood turtle within the Annapolis River watershed, in order to identify areas for increased stewardship efforts.



In 2015 a draft Recovery Strategy for the Wood Turtle (*Glyptemys insculpta*) in Canada was released, and open to public comment until April 1, 2016. Once a final Recovery Strategy has been approved, and subsequent Wood Turtle Action plans developed, CARP will continue to ensure that the Wood Turtle Monitoring and Stewardship supports national recovery efforts.

CARP would like to pilot the use of GPS trackers that will be affixed to selected individuals, to monitor the frequency of their interactions with threats within their habitat (i.e. roads, agricultural activities, etc.). This will increase the knowledge of turtle movements in the watershed, and allow a better assessment of the levels of risk that populations are exposed to. However, at this time, purchase of the required equipment is financially unfeasible.

#### Project Funder:



### Growing Ecological Health: Community Reforestation

#### Goals/Objectives:

The overall goal of the Community Reforestation project was to improve ecological health in the Annapolis River watershed by planting native trees and shrubs in a variety of landscapes to achieve site specific ecosystem enhancement and restoration objectives. Objectives included restoration of degraded riparian habitat, creation of shelterbelts to improve habitat connectivity, enhancement of degraded forest ecosystems, and increasing tree cover in urban landscapes. The project also provided an opportunity for community members to contribute to tangible ecological enhancement actions, which helps to develop strong connections with the local ecosystem, and foster a philosophy of ecological stewardship within individuals and their community.



## Highlights:

Project activities allowed for ecosystem enhancement and restoration activities on 24 sites. Nine of the sites were planted with caliper trees to improve the urban environment of schools, towns, trails and parks. Fifteen sites were planted with tree seedlings. For each site:

- a thorough site assessment was conducted, which included soil tests, observation of existing vegetation, wind and harsh climate exposure and present and past uses;
- tree selection was then made according to the site requirements and objectives of the planting site
- professional recommendations regarding tree care and maintenance were provided to all landowners
- In total 6378 trees and shrubs were planted, this includes 6120 seedlings, 51 caliper trees and 207 shrubs
- 3 hectares of shore line were protected
- 44.6 hectares of habitat were protected

The 2015 community reforestation project was extremely successful in engaging volunteers in ecosystem enhancement actions, with 430 community members participating in the project, including local students, community groups and private landowners. The project was also very effective in fostering partnership with key stakeholders, including the Municipality of the County of Annapolis and the Town of Annapolis Royal.

**Next steps:** There are still many sites within the watershed that require additional restoration and/or enhancement efforts. Clean Annapolis River Project will consider how future projects can address these sites.

## Project Funder:



## River Guardians Water Quality Monitoring

**Goals/Objectives:** River Guardians is a citizen science water quality monitoring program that has been running continuously since 1992. The River Guardians program provides information about a variety of water quality parameters, provides training to community members in water stewardship, and has established a long-term record of the river's health.



## Highlights:

- Biweekly monitoring events at 8 sites from April through October, 2015
- Parameters monitored: E. coli bacteria, dissolved oxygen, water temperature, air temperature, pH, conductivity, turbidity
- Biweekly reporting of bacteria levels through public signs at 6 River Guardians sites
- Biweekly reporting on a project website, hosted at <http://riverguardians.weebly.com/>

**Next steps:** Monitoring will be continued at all 8 sites in 2016-2017. Data collected through the River Guardians program will be analyzed to identify long-term trends, and incorporated into project planning. Additional efforts will be made to ensure that results from monitoring are publicly visible, in order to raise awareness about threats to water quality.

**Project Funders:**

TD Friends of the  
Environment  
Foundation



## Land-Based Impacts on Estuary Health

**Goals/Objectives:**

The goal of this project was to conduct GIS land-used mapping to identify key stressors impacting the environmental health of the Annapolis estuary ecosystem.

**Highlights:**

GIS analysis of land-uses within the Annapolis River watershed was completed by Jott Consulting. Land-uses examined included: municipal wastewater/sewage treatment, onsite sewage, impervious surfaces, agriculture, forestry, aquaculture, and urban, commercial and industrial land uses. A report compiling results of GIS analysis, a discussion of potential impacts associated with each land-use type, and recommendations for future project planning was produced for internal use and public dissemination among partners and key stakeholders.

**Next steps:**

GIS data layers and results from the project report will be used to facilitate future project planning by CARP. The final report will be made publicly available and disseminated to stakeholders. There is also opportunity for further refinement of data layers, and ground truthing to ensure data reflects current land-uses.

**Project Funder:**

Canada

This project was undertaken with the financial support of the Government of Canada.  
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## Atlantic Canada Estuary Health Assessment

**Goals/Objectives:**

The Atlantic Canada Estuary Health Assessment project is an ecosystem-based action plan to increase knowledge and enhance integrated ecosystem planning in select estuarine environments across the four Atlantic Provinces. This project was a collaborative effort between environmental groups from the Bay of Fundy, Nova Scotia South Shore, Gulf of St. Lawrence, & western Newfoundland, working together to address estuary health in Atlantic Canada.

Clean Annapolis River Project has completed an environmental health assessment of the Annapolis Basin through the analysis of water samples from 20 randomly selected sites within the estuary.

**Highlights:**

- Water samples were collected from 20 sites across the Annapolis basin estuary, and analyzed for eutrophication indicators (nutrients): chlorophyll a, nitrogen, and phosphorous, as well as Secchi depth and dissolved oxygen.

- Fifteen of the sampling sites were chosen for coliform analysis (bacteria) and sampled five times, once in each season in dry conditions, once after a moderate rainfall, and once after a heavy rainfall.
- In the 5 most coastal sampling sites, a sediment sample was collected and analyzed for trace metals, mercury, polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine (OC) pesticides, & total organic carbon (TOC).
- A “Report Card” was produced to communicate the results of the analysis to partners and the public

#### Next Steps:

A responsive action plan was developed based on the results of water quality analysis, primarily to address bacterial contamination, which can help guide future project development. In future years, CARP hopes to conduct additional monitoring on bacterial levels within the estuary, and assess impact of ocean acidification on the Annapolis basin estuary ecosystem.

#### Project Funder:



### Positive Aging: Education to Action

#### Goals/objectives:

The objective of the “Education to Action” program was to create communities that are engaged in local environmental stewardship initiatives through the promotion of knowledge sharing, capacity building, and by creating inclusive opportunities for participation in citizen science programs by seniors.

#### Highlights:

A variety of public events targeted to seniors were delivered through the project, including:

- 12 public seminars and guest presentations and seniors residences and to community groups whose membership includes seniors;
- Pollinator garden planting at 3 long-term care facilities, and training on butterfly identification and the “Monarch Watch” program;
- 3 training sessions focused on bird identification and contribution of data to citizen science programs, such as the spring migratory bird count, the Christmas Bird Count, and e-Bird;
- Historical angler data collection to support ongoing fish habitat restoration projects.

**Next steps:** CARP will continue to seek ways to engage community members in education and outreach programs that foster an ethic of environmental stewardship and help to develop knowledge and support for environmental conservation initiatives.

#### Project Funder:



## Community Outreach and Education

### Goals/Objectives:

To raise awareness and increase knowledge about environmental issues specific to the Annapolis River watershed and to encourage community members to become engaged in stewardship and conservation actions.

### Highlights:

CARP was able to host a variety of public education and outreach events, and support other community organizations and local schools through guest presentations, and by developing and facilitating custom programs and field activities.

- Engagement of over 300 students from schools across the watershed
- Support for environmental education related programs including: local science fairs, the Annapolis Valley Regional Science Fair, the Citizen Science Expo, the Young Naturalists Club, NSCC Sustainability Days, the Science Atlantic Aquaculture and Fisheries Conference, and Nova Scotia Envirothon
- Support for community events/activities such as Raven Haven Family Fun Day (County of Annapolis), Lawrencetown Exhibition, field days with Girl Guides units, Town of Annapolis Royal Trout Derby, wildlife day at the Fundy YMCA Youth Zone, and more
- Special public programs, including *Kids River Walk*, lunch-n-learn sessions, coordination of the Christmas Bird Count, guided interpretive hikes at First Lake and the Annapolis Basin Trail, and more

**Next steps:** Continue to raise awareness about watershed issues and improve community capacity to engage in stewardship actions.



### Other Financial Support:

