Clean Annapolis River Project

October 2017

Hugging a beautiful yellow birch found during a wood turtle visual survey with our youth leader team

The Waterstrider

News from CARP's frontline

VOICE YOUR IDEAS: CARP and Annapolis County to host community engagement sessions focused on land and water management

Clean Annapolis River Project (CARP) is encouraging Annapolis County residents to voice their ideas and concerns in an upcoming series of community engagement sessions focused on the management of land and water resources in the Annapolis River watershed.

Thanks to financial support from the Rural Community Foundation of Canada's Community Fund for Canada's 150th and the Municipality of the County of Annapolis, CARP is partnering with the County of Annapolis to undertake a strategic planning project that focuses on integrated resource management in the watershed.

This project will allow CARP to link its 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".

Community engagement sessions continued…

By undertaking this process with support of the Municipality, CARP will be better positioned to focus its efforts on the issues of greatest import and impact to the residents of the region while aligning and supporting the existing municipal economic development strategy.

Community engagement sessions are scheduled for:
Thursday October 12, 7-9 PM, Bridgetown, Bridgetown Fire Hall
Tuesday October 17, 7-9 PM, Wilmot, Wilmot Community Center
Wednesday October 18, 7-9 PM, Annapolis Royal, Port Royal Legion

Meetings will be facilitated by an external moderator, with CARP and County staff present. Objectives of the community engagement sessions include collect data… (1) to understand community values as they relate to land and water resources; (2) to identify community concerns related to land-use management and water resources; and (3) to begin to assess management needs related to land use and water resources.

Broad community representation will help to ensure that the data collected and recommendations stemming from the project reflect the interests of the many communities and stakeholder groups of Annapolis County. For those who are unable to attend an in-person meeting, an online survey will be available through the CARP website.

The community meeting series will be followed by targeted stakeholder meetings, in order to gain further insight into the challenges related to land-use and water management issues, and to define solutions to these challenges where possible.

This initiative is made possible by the Community Fund for Canada's 150th, a collaboration between Rural Communities Foundation of Nova Scotia, the Government of Canada, and extraordinary leaders from coast to coast to coast.

Back to school season highlights

We are only 5 weeks into the new school year, but already CARP has had the chance to work with classes from Digby Regional High School, Annapolis West Education Center, Bridgetown Community School, Lawrencetown Education Center, and Middleton Regional High School. These students groups have made valuable contributions to projects such as riparian zone enhancement, tree planting, and invasive species removal.

Left: removing invasive shrubs to restore a pollinator garden at Riverside Park with the grade 10 Middleton O2 class;
Right: the grade 11 O2 class from Bridgetown planted 207 tree seedlings in a new riparian buffer zone.

Restoring aquatic connectivity in the Annapolis River watershed and beyond

September 30 marked the final day of in-stream fish habitat restoration activities. Beginning October 1 water courses are closed to in-stream activity to mitigate threats to spawning brook trout. It was another action-packed restoration season. One of the major components of our ongoing fish habitat work addresses habitat fragmentation caused by barrier culverts. Restoration activities were conducted at 10 sites, with specific actions including 7 debris removals, construction of 6 tail water control structures, low flow barrier installation at 2 sites, baffle installation at 3 sites, and fish chute installation at 5 sites. Additionally, 5 digger logs were installed on the Black River and sand wanding was completed on approximately 1800 square metres of the Fales River system.

Partnering to improve fish habitat beyond the watershed boundaries

CARP was able to draw on its years of experience with instream fish habitat restoration to provide support for a similar project being conducted by Mersey Tobeatic Research Institute, who is working in partnership with Medway Lakes Protected Area and The Medway Community Forest Co-op. In upcoming weeks we will be working with Bear River First Nation to conduct Habitat Suitability Index surveys and provide some training during the process.

CARP has also been collaborating with NSLC Adopt A Stream staff in the delivery of fish habitat on the creation of a culvert database that will be able to house aquatic connectivity data from across the province in a central location, and which will provide a tool for CARP and other community groups to use in the future to help in evaluating aquatic connectivity in their own watersheds for a variety of species.

Fish habitat restoration techniques and terminology

Debris removals- debris removals involve the removal of coarse woody debris, boulders, and other materials that accumulate and plug culverts.

2017 Summer student crew working on a double culvert debris removal in Lawrencetown.

Tail water controls- tail water control structures that essentially control the height of the outflow pool on the downstream side of a culvert. Structures such as rock weirs can be used as tailwater controls to elevate the water levels in outflow pools.

A rock weir under construction in South Williamston during the 2017 field season.

Outflow chutes- outflow chutes are used to direct water into a passable channel at the outflow of a culvert. These chutes create a channel of water that fish can travel through.

A fish chute installed during the 2016 field season.

Low flow barriers- cedar posts are used to install low flow barriers in double culverts where fish chutes are also installed. Barrier are placed at the inflow of one of two culverts to redirect water to the culvert with no barrier during low flow conditions, allowing fish to pass through the culvert.

A low flow barrier installed at the inflow of a double culvert during the 2016 field season.

Baffles- baffles help to reduce water velocities through a culvert and are used to raise the water level in a culvert. Baffles direct water flowing through a culvert to notches sized for low flow conditions. The redirection of flow between baffles creates artificial pools and eddies and helps slow water velocities.

A series of baffles installed during the 2016 field season.

Sanding wanding- sand wanding is a technique used to remove sand and silt from gravel-cobble bed streams, improving spawning habitat for salmon and trout.

Sand wanding being conducted on the Fales River in September 2017.

Digger logs- digger logs are installed in the stream bed to support a riffle upstream and create a pool downstream, which enhances trout and salmon habitats and develop aquatic habitat diversity

A digger log being installed on the Black River during the 2017 field season.

Have you considered volunteering?

Even as the field season winds down, there are a number of critical volunteer roles that we are hoping to fill. Anyone interested in learning more about these or other volunteer opportunities is encouraged to contact the office.

Fund development committee- We are seeking individuals with experience related to social enterprise and entrepreneurship who can contribute their skills to the exploration and development of new funding strategies and opportunities.

Membership committee volunteers- We are seeking volunteers who can help champion our membership program. This includes soliciting new business partners for our member incentive program, developing strategies for membership recruitment, and recruiting new members

Youth Leading Environmental Change
Contributed by Sebastian Conyers

"I have been a member of the CARPs Youth Leading Environmental Change Program for two years. It is hard work but is also one of the most rewarding things I do in the year.

CARP is not just about cleaning the Annapolis River. We do a whole bunch of different things as a group with our dedicated program leader Katie. We survey wood turtles which are an endangered species in Nova Scotia; clean fish habitat which includes building weirs and cleaning clogged water ways; and sturgeon egg habitat surveying. Building and maintaining pollinator gardens and giving outreach talks for our communities are other activities we do in our program.

Everything we do with CARP is always adventurous and educational. One of my favorite activities is wood turtle tracking. This is when we track a wood turtle with a metal tracking rod to track a radio transmitter that we have put on one of the wood turtles. We then travel through the area the turtle was last seen and hopefully pick up a signal. If we find him/her we then weigh, measure and check their general health.

I love this program. I get to see things some people will never see in their life and most likely never will. For example, watching wood turtle babies hatch from their nest for the first time in their life and being able tag them and hopefully see them again sometime in the future.

Working with CARP as a youth member is a lot of fun and is a great way to get out side. CARP not only teaches you about the environment, it also makes us appreciate and respect nature. This is not only for our benefit but also for those who live in it which includes us."

Left: Sebastian teaching a group about wood turtle during CARP's "Wood Turtle Day" program at Oaklawn Farm Zoo

Right: Sebastian radio tracking one of the tagged wood turtles

Creating riparian buffers on the Annapolis River

In 2017 CARP received funding through the Recreational Fisheries Conservation Partnership Program to support the creation of riparian buffer zones on agricultural lands adjacent to the Annapolis River. Two thousand metres of fencing is being installed, most of which is located on a large cattle pasture in Bridgetown, where locally cattle are well known for their free access to the Annapolis River. CARP is working with local students to plant trees and shrubs in the new buffer zone, helping to advance the regeneration of vegetation at the site.

Vegetated riparian buffers provide a wide array of beneficial ecological services, including:

- Improving water quality by filtering nutrients and sediment found in run-off
- Mitigating the impacts of flooding events
- Stabilizing river banks and preventing erosion
- Storage of ground water
- Provision of wildlife habitat
- Regulation of stream water temperature

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Initial fence posts installed along the Annapolis River.

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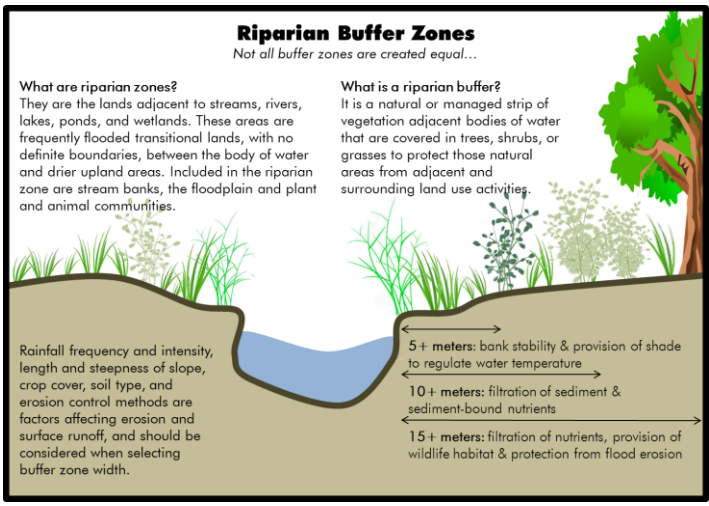
Regulation of buffer zones

In Nova Scotia there are no regulations requiring that farms establish riparian buffers. All of the farms that create and maintain buffer zones do so voluntarily.

There are examples of provinces with regulations requiring that buffer zones be established on agricultural lands. For example, in 1999 Prince Edward Island introduced buffer zones as a way to protect watercourses and wetlands. A 15 meter buffer zone is required adjacent to all watercourses and wetlands.

General rules for buffer zones in PEI

- In buffer zones you need a permit to:
    - alter or disturb the ground or soil
    - dump any material or objects of any kind
    - remove soil or rocks
    - build, repair or remove structures or obstructions of any kind
    - operate vehicles or non-agricultural equipment
    - cut down live trees and shrubs
- You may not grow agricultural crops or use pesticides in a buffer zone except those next to wetlands that are completely shrub swamps, bogs, wooded swamps, seasonally flooded flats, meadows or landlocked ponds. You may prune trees and shrubs in buffer zones as long as you follow the rules above.
- You may also plant grass, trees and shrubs as long as you only use hand tools. You may also cut the grass in a buffer zone. Agricultural equipment may turn in a buffer zone.
- Livestock operations may NOT
    - allow any livestock waste to enter any watercourse or wetland
    - build or expand any intensive livestock operation within 90 metres of any watercourse or wetland without authorization from the Department of Environment, Labour and Justice.



Stormwater management on your property

Stormwater refers to 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 run off and end up in nearby streams, rivers, or other water bodies (surface water). As the amount of area covered by roads, buildings and other impervious surfaces increases, the volume and speed of surface water runoff increases.

Stormwater impacts water quality and quantity by:

- transporting pollution (e.g., sediment, nutrients, debris, household hazardous wastes) directly or indirectly via storm sewer systems into rivers, lakes and streams;
- eroding shorelines, by increasing the volume and velocity of runoff entering receiving water bodies;
- flooding basements and/or on property;
- warming up surface water, making it more susceptible to waterborne bacteria and hazardous to fragile aquatic life;
- overflowing sewage treatment facilities, allowing untreated human waste to flow directly into receiving water bodies.

CARP is currently working with Bluenose Coastal Action Foundation on a project titled *Soaking Up Stormwater*. During winter 2017-2018 there will be a number of workshops designed to help homeowners and municipalities manage stormwater on their properties. Dates and times will be announced on our website and Facebook page.

Another successful Annapolis River Festival

With great excitement, the Annapolis River Festival organizing committee is proud to announce that the 2017 Annapolis River Festival has set a three-year fundraising record, netting $36,400 in support of Clean Annapolis River Project.

Clean Annapolis River Project is a community based environmental organization that works on projects related to the Annapolis River watershed, which spans roughly 2000 square kilometres between Digby and Aylesford. In an effort to adapt to changing funding opportunities the organization has been undertaking major efforts to secure funds that are not dependent on external grants. The creation of a signature fundraising event was identified early on as a key ingredient to this recipe, and thanks to the dedication and vision of a group of volunteer community members, the Annapolis River Festival has hit the mark.

The event takes place at Jubilee Park, where the new floating dock facilities were a welcomed addition to the waterfront activities, which include dragon boat races, guided boat tours and canoe races. On land, activities included live music, a food and beverage tent, a skill sharing expo, kids' games, and CARP's native fish display tank.

The event would not have gained traction without the buy in of sponsors, many of whom have been supporting the Festival since its first year. 2017 sponsors included: The Municipality of the County of Annapolis, Nova Scotia Power, Bridgetown Pharmasave, Investors Group, Lequille Country Store, Graves Freshmart, Fraser's Pro Homecentre, End of the Line Pub, Nautical Seafoods Ltd., Connell Motors, Hamilton Eel Fisheries Ltd., Spicer Construction, Rice's Contracting Ltd., Scotia Bank and Tim Hennigar.

Not only did the Festival surpass itself in terms of fundraising, attendance grew to over 1600 festival goers, with 457 people participating in on-the-water events. Seventeen Dragon Boat teams entered the races, sponsored by Bridgetown Pharmasave, Brite-Span Building Systems, Investors Group, Spicer Construction, Acadian Seaplants, Michelin, Royal Bank, Valley Credit Union, Atlantic Lotto, with an additional 4 community teams.

It takes over 120 volunteers to pull the event off, all under the leadership of Festival Co-coordinators Murray Freeman and his protégé Josie Todd. In a community where so many events are driven by volunteers, CARP is grateful for all of the time and energy that the community is willing to invest in the Festival.

When Festival Co-chair Josie Todd was asked why she signed-on for the job the passion behind her motivation is evident, "When I was growing up we spent a lot of our leisure time in the woods canoe tripping and camping. I went on to study biology and learned about how important is to live in a way that doesn't interrupt the function of the ecosystems we all depend on. I really believe in the work of the Clean Annapolis River Project to enhance the ecological health of the watershed through action and community outreach. The Annapolis River Festival supports that work in a major way."

The organizing committee is already considering feedback to improve the event, and brainstorming exciting new events to keep it fresh. Look for an announcement of the 2018 date soon.

Top Left: Co-chairs Josie Todd and Murray Freeman; Top right: dragon boat racers; Bottom left: HMCS Acadia cadets preparing the whalers; Bottom right: fierce competition during the dragon boat races

Application of remote sensing data in the Annapolis watershed

This summer CARP was successful in its application to the National Wetlands Conservation Fund, a program under Environment and Climate Change Canada, for a wetland restoration project titled : *Restoration and Enhancement of Wetlands on Working Landscapes*.

One of the objectives of the first year of the project is to analyze geospatial and digital elevation data to model, identify and prioritize potential wetland areas in the Annapolis River watershed for restoration. This work will employ a range of technologies, including remote sensing technologies (LIDAR surveys), GIS analysis, and aerial photography. CARP is able to do this work thanks to partners like the Applied Geomatics Research Group (AGRG) who will process LIDAR data, and the Centre of Geographic Sciences (COGS) who will assist with the geospatial modeling and analysis of potential wetland areas.

Light Detection and Ranging (LIDAR) is a remote sensing method used to examine the surface of the Earth. LIDAR systems allow scientists and mapping professionals to examine both natural and manmade environments with accuracy, precision, and flexibility (NOAA, 2017).There are two types of LIDAR, topographic which is used to map the land, and bathymetric which is used to map the seafloor and river beds.

This Fall the AGRG team conducted flights between Bridgetown and Middleton to capture data for both the nearshore and river. Topographic LIDAR data will be used for the wetland restoration project. The model developed for the project will be used to identify potential wetland restoration sites in the Annapolis River watershed, prioritize sites for suitability for wetland restoration, and guide future wetland restoration planning in the watershed.

CARP hopes that bathymetric LIDAR data can be used in the future to develop a hydrodynamic model for the Annapolis estuary. This model could be used to support climate change adaptation and mitigation projects, as it can be used to better understand and plan for the impacts of sea level rise. The model could also be used to examine the impacts of tidal barrier removal, such as modification or breaching of dykes and other tidal barriers, in order to support salt marsh and other coastal habitat restoration initiatives.

The Applied Geomatics Research Group is a team of Research Scientists, Research Associates, and graduate students, applying a suite of Geomatics technologies to explore environmental, health and social issues. As part of Nova Scotia Community College's Centre of Geographic Sciences in Middleton, Nova Scotia, AGRG are acknowledged leaders in educating new researchers in an exciting, growing field.

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