City Stream Watch 2015

Summary Report











City Stream Watch 2015

MVCA RVCA SNC

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Thank you to our 2014 Funding Partners:

Community Foundation of Ottawa: The Community Foundation of Ottawa awarded $10,000 for the RVCA City Stream Watch Invasive Species Targeting Project. These funds supported nine invasive species removal projects that took place along six waterways in the Rideau Valley watershed this year.

Introduction

The collective goals of the City Stream Watch Program at the three Conservation Authorities are to:

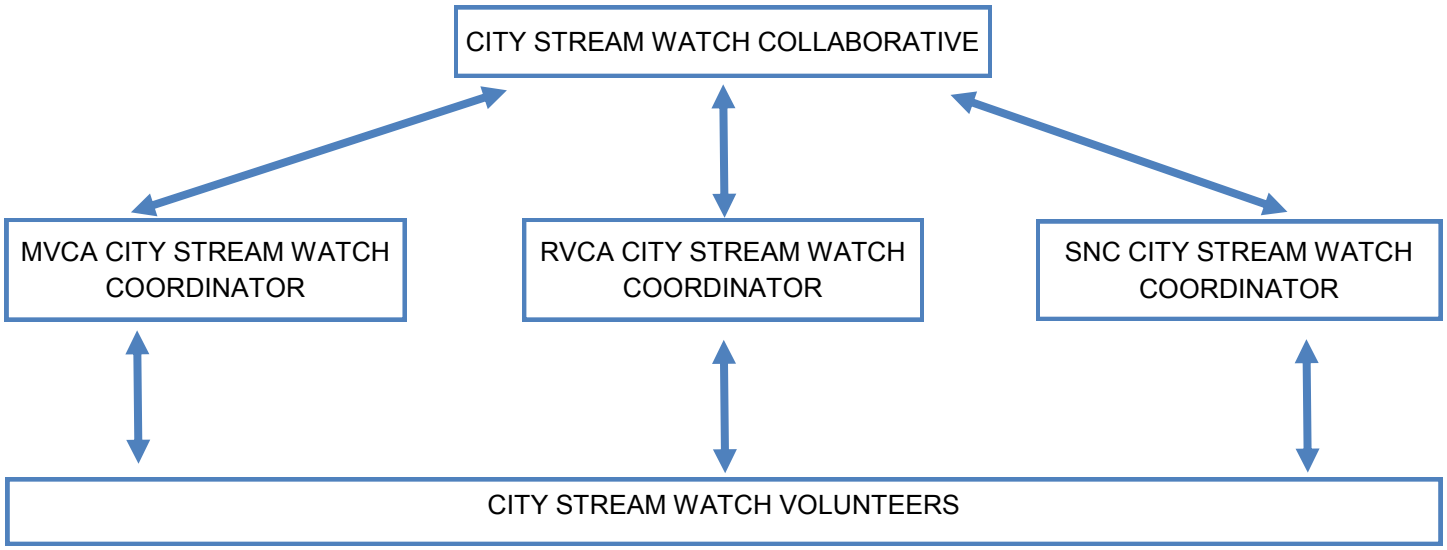
- Provide consistent data collection, data management and reporting of urban and rural stream health across the City
- Target restoration initiatives and landowner stewardship actions based on monitoring results

Mississippi Valley Conservation
With the recent focus on development and restoration activities in the Kanata West Development area, Mississippi Valley Conservation (MVCA) and the Friends of the Carp River (FCR) have undertaken several initiatives aimed at assessing and furthering the health of the Carp River Watershed. The Carp River Watershed/Subwatershed Study (2004) recommended enhancements to habitat and flow, and targeted stewardship activities as key objectives in restoring the overall health of the river. In 2012, MVCA staff and FCR undertook a field study to identify priority areas for restoration and stewardship actions, to assess expanding upon the monitoring efforts downstream of the Kanata West Area and to test a pilot citizen science based volunteer monitoring program in the Carp Watershed. Based on the success of this initial work, there is interest in continuing and expanding upon these efforts by offering the City Stream Watch program in the Carp River watershed and other watersheds within the City which are subject to similar changes in land use and associated impacts.

Rideau Valley Conservation Authority
The Rideau Valley Conservation Authority (RVCA) and key partners collaborated to develop the *Lower Rideau Strategy* which lists a number of environmental issues and/or threats along many of the tributaries. These include poor water quality, loss of vegetation (including wetlands and forest), loss of biodiversity, changes in hydrology and stream alterations. The report recommended that to improve conditions along these tributaries, local agencies need a coordinated approach to promote good land stewardship practices and provide public educational opportunities. These recommendations are objectives of the City Stream Watch program. Although the *Lower Rideau Strategy* does not include all of the tributaries that City Stream Watch works on, the tributaries of the Ottawa River face the same issues and threats, and the same recommendations apply.

South Nation Conservation
Within the South Nation Conservation's (SNC) jurisdiction in the City of Ottawa there are a number of urban streams which have been impacted by development and urbanization. These streams have limited or no riparian green space which negatively impacts water quality and the aquatic habitat due to increased runoff, erosion, pollution, and water temperature. Implementing the City Stream Watch Program in the SNC watershed will address these issues while also focusing on recommendations from the City of Ottawa's Water Environment Strategy. Furthermore, the City Stream Watch Program will lead to improvements in program consistency between the three Conservation Authorities within the City of Ottawa and greater overall understanding and collaboration.

City Stream Watch Organizational Chart



Stream Habitat Assessment Methodology

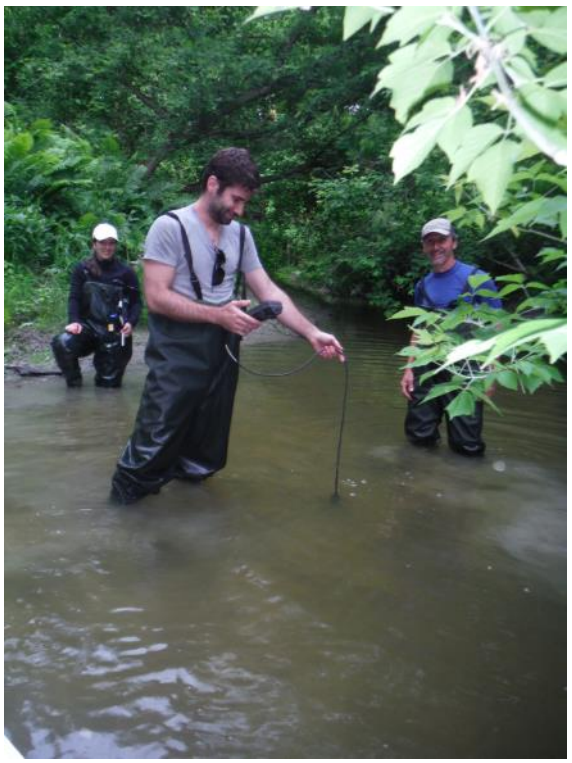
The City Stream Watch program uses a stream characterization assessment protocol for surveying streams. The protocol was originally developed by the Ontario Ministry of Natural Resources and Forestry (MNRF), but was modified by the RVCA to make it more effective for monitoring purposes and more easily performed with volunteers.
Each stream is monitored on a cyclical basis every six years to help track changes over the long term and measure success of stewardship and restoration efforts. Throughout the field season, for each stream being surveyed, staff and volunteers begin at the mouth of the stream and survey to its headwaters. The following data is recorded for each 100 metre segment:

- Stream width and depth, bankfull width and depth
- UTM coordinates for the start and end of each 100 metre section
- Water quality parameters: dissolved oxygen, conductivity, pH, temperature
- Air temperature
- Overhead cloud cover
- Photographs of start and end of section
- Human alterations, land use, bank stability, bank composition, shoreline vegetation types
- Instream morphology, instream habitat (substrate, vegetation abundance and type, woody debris, vascular plants, undercut banks)
- Details on beaver dams, stormwater outlets, tributaries and migratory obstructions to fish passage
- Pollution/garbage observed
- Wildlife observed
- Enhancement and restoration opportunities

Measuring wetted width

Measuring 50 metres upstream

Volunteers displaying the equipment used for stream habitat assessments



Measuring water quality parameters

Headwater Drainage Feature Protocol

The City Stream Watch program added the Headwater Drainage Feature (included in the Ontario Stream Assessment Protocol—OSAP) protocol to the program in 2013. This protocol measures zero, first and second order headwater drainage features (HDF). It is a rapid assessment method characterizing the amount of water, sediment transport, and storage capacity within headwater drainage features. RVCA is working with Toronto and Region Conservation Authority (TRCA) and the MNRF to implement the protocol with the goal of providing standard datasets to support science development and monitoring on headwater drainage features.

Additionally, this module provides a means of characterizing the connectivity, form and unique features associated with each HDF (OSAP Protocol, 2013). An initiative is underway to evaluate how these data can help in understanding the cumulative contributions of individual headwater drainage features on the downstream watershed state (see Stanfield et al., 2013).

Headwater drainage features have not traditionally been a component of monitoring efforts, and as such, little is known about their form and function in the landscape (OSAP, 2013). These features may provide direct, both permanent and seasonal, habitat for fish by the presence of refuge pools, seasonal flow, or groundwater discharge. They may also provide indirect habitat through the contribution of exported food (detritus/invertebrates) (Wiplfi and Gregovich 2002). These features may be important sources, conveyors or storers of sediment, nutrients and flow, and may have an important role for terrestrial species, such as amphibians (OSAP, 2013).

HDFs include small streams, springs, wetlands, swales and ditches and have variable flow conditions from perennial to ephemeral streams. Regardless of the form of the HDF (natural or human made), new science is suggesting that they play an important role as the interface between land and water for water and sediment transport and as corridors for the migration of biota (OSAP, 2013). As a result of their importance and a lack of information for headwater drainage features the City Stream Watch program has incorporated monitoring of these systems for each catchment.

In 2015 the MVCA City Stream Watch program sampled 23 HDF sites focusing on the Kanata North area, Corkery Creek, and Huntley Creek.

In 2015 the RVCA City Stream Watch program sampled 35 sites in the Barrhaven Creek, Bilberry Creek, Mosquito Creek and Stillwater Creek catchments of the Rideau Valley watershed.

In 2015, the SNC City Stream Watch program sampled 50 sites within the City of Ottawa in the North Castor River Subwatershed.

For more information regarding sample locations please see the individual 2015 catchment reports for each subwatershed.

Measuring slope in the Mosquito Creek catchment

Measuring wetted width

Fish Sampling Methodology

Due to different habitat characterizations along the length of a stream, a variety of fish sampling methods are used to identify which species are present at each site sampled. This allows a number of different habitat types to be sampled. Fish sampling is done in accordance with protocols or best practices in order to live-release the fish after sampling is finished.

Seine net (OSAP module)

- Rectangular, with a three-dimensional box in the middle
- One person holds net on shore and other pulls net through water column
- Fish are directed towards the purse in the middle and collect there

Windemere trap

- Resembles a lobster trap but has a metal frame covered in mesh
- Mesh funnels at either end guide the fish into the trap
- Used in shallow areas, with slow or fast moving water
- Used on electrofishing sites in peak spawning periods

Fyke net

- Modified hoop net (series of hoops and funnels covered in mesh, with a lead line and wings)
- Depending on size, can be used in shallow or deeper waters and are good alternatives in places that are difficult to seine or electrofish
- Nets can be set up from 24 hours to multiple weeks, but checked every 24 hours to release any fish that have been caught

Electrofishing (OSAP module)

- Effective way to sample fish in a variety of habitats
- One of the key tools used to effectively sample fish communities
- Electricity is passed through the water which causes a muscle response reaction in fish, temporarily stunning them
- Netters scoop fish from the stream and place in a recovery bucket
- Electrofishing very seldom kills fish if the correct procedures are used
- Electrofishing is completed by staff that have been certified according to provincial standards

Thermal Classification Methodology (OSAP module)

Temperature is an important parameter in streams as it influences many aspects of physical, chemical and biological health. Temperature dataloggers are deployed in each of the creeks from April to late September to give a representative sample of how water temperature fluctuates. Many factors can influence fluctuations in stream temperature including: springs, tributaries, precipitation runoff, discharge pipes and stream shading from riparian vegetation. Water temperature is used along with the maximum air temperature (using the revised Stoneman and Jones method) to classify a watercourse as either warmwater, cool-warmwater, coolwater, cold-coolwater or coldwater .

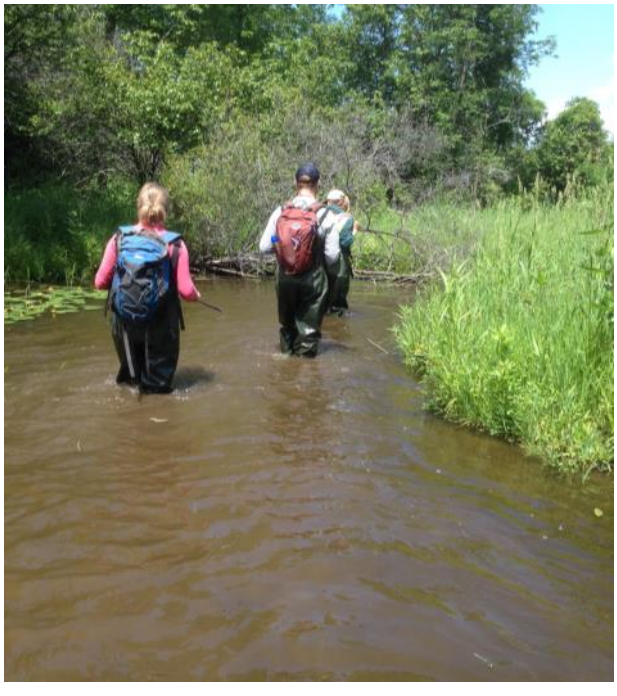
Table 1 Water temperature range classification based on an air temperature of 25 °C

Status	Water Temperature °C
Cold	< 15
Cold-cool	15-17
Cool	17-20
Cool-warm	20-23
Warm	> 23

Data Management/Users

All data collected is maintained in databases at MVCA, RVCA and SNC. Data collected is valuable and is used on a variety of levels. Various agencies and community organizations throughout the City of Ottawa use City Stream Watch data for:

- Watershed reporting
- Identifying potential rehabilitation projects (riparian and instream)
- Analyzing program success
- Background data for planning and regulations reviews
- Sharing information with other agencies (NCC, City of Ottawa, Fisheries and Oceans Canada, MNRF, Ministry of the Environment and Climate Change, etc.), consultants and non-governmental organizations
- Other projects
- Fish community information sent to MNRF (stored in National Heritage Information Centre—NHIC /Natural Resource and Values Information System—NRVIS databases)
- Reports to public landholders on potential projects, important issues and current conditions
- Sharing with the public on websites
- Species at risk information sent to MNRF (stored in NHIC database)
- Consultant information requests



MVCA City Stream Watch 2015 Summary

The *City Stream Watch 2015 Summary Report* highlights accomplishments from the 2015 field season and describes the nature and extent of volunteer projects. To find information collected on the MVCA 2015 streams surveyed (Corkery Creek and the Carp A tributary), please see their individual reports.
These are shared on our website at: http://mvc.on.ca/citystream-watch/

Stream Study Details

The following table outlines the monitoring activities performed on Corkery Creek and the Carp A tributary in 2015. In total, approximately 5.4 kilometres of stream was surveyed in 2015. A total of 16 volunteers from the community participated in the program throughout the field season, contributing a total of 113 hours walking the streams. Furthermore, an additional 45 volunteers worked 98 hours on various projects highlighted by the City Stream Watch program, including two shoreline plantings, an invasive species pull, and a garbage clean up.

The number of sections surveyed is highly dependent on the number of landowners that grant us permission to access their land. This was especially important this year as almost all of Corkery Creek and Carp A flow through private land being used for residence, farm land, or business. In total, 54 sections of stream were surveyed. There was also the opportunity to sample multiple areas for fish communities, and to keep track of temperature fluctuations with temperature probes. Electrofishing helps give us a better idea of the condition of the stream and its ability to sustain wildlife, while the temperature data gives an idea of the thermal regime for the stream.

Table 2 A summary of the 2014 and 2015 stream monitoring efforts

Activities	Huntley Creek 2014	Watts Creek 2014	Corkery Creek 2015	Carp A Trib 2015
Number of Sections Surveyed	118	28	40	14
Number of Volunteers	17	5	13	3
Total Volunteer Hours	79	25	100	13
Number of Fish Sampling Sessions	1		3	1
Number of Temperature Probes	2		3	1

Volunteer Projects

Shoreline Planting

This year we had multiple volunteer projects aimed to improve the health of the Carp River. On May 20th, two large sites along a tributary of the Carp C subwatershed were planted with the help of volunteers from Senstar Corporation. This shoreline planting helps to create more stable banks and improves the ability of the buffer to remove sediment and minimize the contaminants that reach the stream.

Invasive Species Removal and Garbage Clean-Ups

In June, an invasive species pull for a large stand of Himalyan Balsam was held along Carp Creek. In August, MVCA with volunteers from Pinchin Environmental Ltd, held a stream garbage clean-up event on Poole Creek; not only increasing the health of a large tributary to the Carp River, but also improving the appearance of an important natural feature of the village of Stittsville. Both Carp Creek and Poole Creek were CSW streams in 2013.

Volunteers at the Himalayan Balsam pull on Carp Creek

MVCA City Stream Watch Plans for 2016

In 2016, MVCA plans to:

- Survey Kizell Drain
- Survey Shirley's Brook
- Survey an Unnamed Tributary of Carp 'C' subwatershed
- Contact landowners on Corkery Creek for potential shoreline restoration projects

If you are interested in volunteering with MVCA's City Stream Watch program please call our office at 613-253-0006 or go online at: http://mvc.on.ca/volunteer-contact/

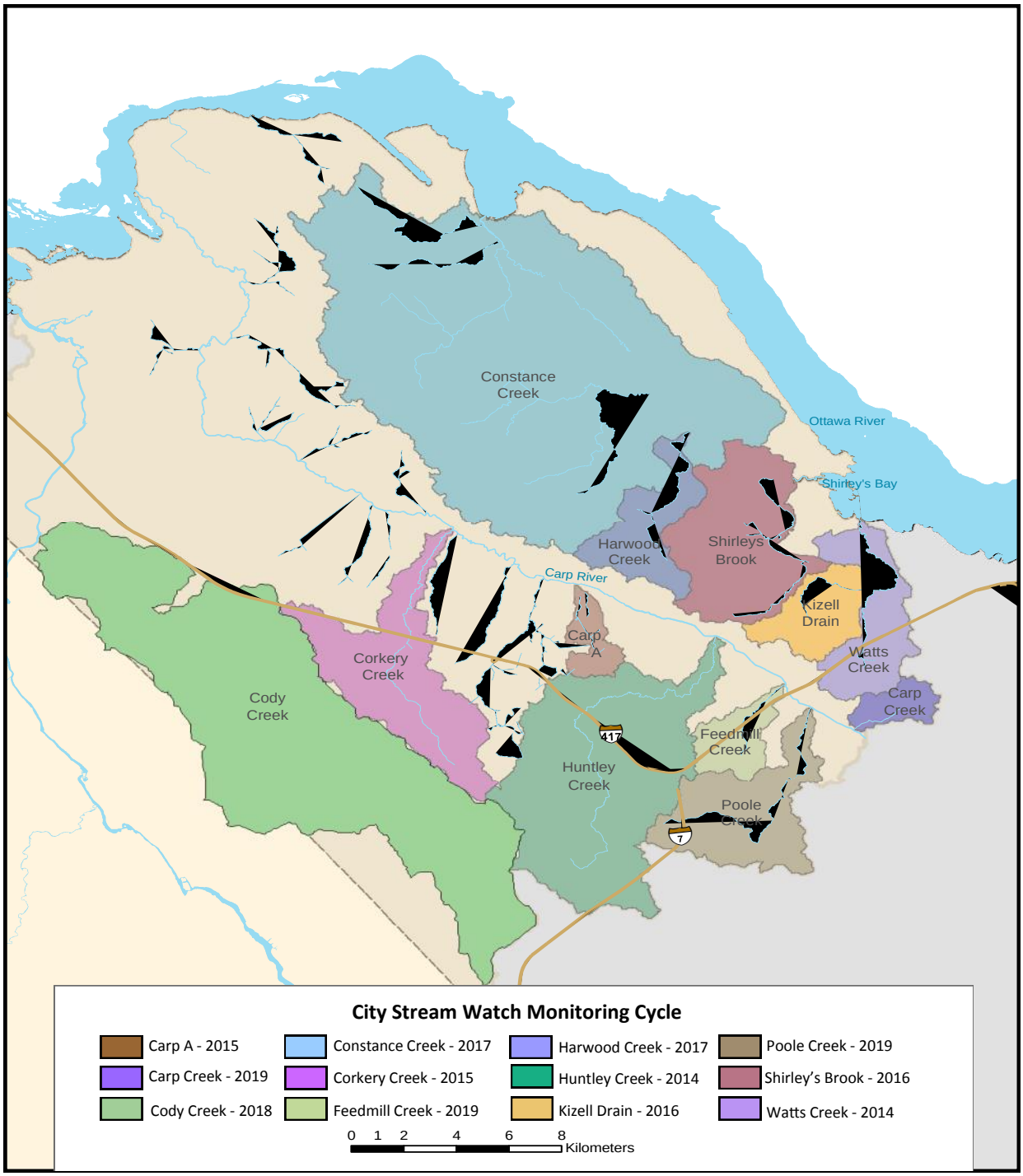


Figure 1 Location and rotation of MVCA City Stream Watch monitoring

RVCA City Stream Watch 2015 Summary

The *City Stream Watch 2015 Summary Report* highlights accomplishments from the 2015 field season and describes the nature and extent of volunteer projects. To find information collected on the RVCA 2015 streams surveyed (Barrhaven Creek, Bilberry Creek, Mosquito Creek, Stillwater Creek), please see their individual reports. These are shared on our web-site at: http://www.rvca.ca/programs/streamwatch/index.html
A total of 315 volunteers from the community participated in the program throughout the field season, contributing a total of 941 hours working on various projects. Approximately 26 kilometres of stream were surveyed in 2015.

Stream Study/Comparison

The following table is a comparison summary of monitoring activities carried out on Barrhaven, Bilberry, Mosquito and Stillwater Creek. Monitoring was conducted over three reporting cycles between 2004 and 2015. Bilberry Creek, Mosquito Creek and Stillwater Creek were surveyed in 2004, 2009 and 2015. Barrhaven Creek was surveyed in 2009 and 2015. Each year the number of sections surveyed is different depending on the number of sections where permission to access the creek is granted, additional tributaries and branches surveyed, as well as whether or not water is flowing in the upper reaches of the creek at the time of surveying. For Barrhaven Creek, low water levels in the section upstream of the stormwater pond resulted in fewer sections surveyed in 2015. On Bilberry Creek, even though a new branch in the upper reaches of the creek was surveyed in 2015, fewer sections were surveyed overall. On Mosquito Creek, limited access resulted in fewer sections surveyed in 2015 whereas 21 more sections were surveyed on Stillwater Creek in 2015 because crews surveyed two additional tributaries of the creek. On all four creeks, volunteer numbers and hours decreased in comparison to the numbers seen in 2009. On Barrhaven Creek, volunteer numbers were unavailable for 2015 because the 15 creek sections were used to train new students working with the program. Reduced volunteer numbers were seen even on Stillwater Creek where more sections were added in 2015. The decrease in volunteer hours and numbers can be attributed to improvements that were made to the Stream Characterization protocol and field sheets in 2014. The changes have made the stream survey process more efficient resulting in less time spent surveying each 100 metre section.

Table 3 Stream study comparison between 2004, 2009 and 2015
N/A: in 2004 volunteer numbers were not tracked by creek

Activities	Barrhaven Creek 2009	Barrhaven Creek 2015	Bilberry Creek 2004	Bilberry Creek 2009	Bilberry Creek 2015	Mosquito Creek 2004	Mosquito Creek 2009	Mosquito Creek 2015	Stillwater Creek 2004	Stillwater Creek 2009	Stillwater Creek 2015
Number of sections surveyed	20	15	45	75	71	28	85	75	65	79	100
Number of volunteers	31	N/A	N/A	63	23	N/A	44	33	N/A	74	43
Total volunteer hours	113	N/A	65	267	87	38	210	117	72	318	152
Number of fish sampling sessions	3	13	5	5	15	1	6	17	5	4	16
Number of temperature probes	1	2	2	4	3	2	4	4	2	4	7

A volunteer measuring water depth

Volunteers measuring 50 metres upstream

The Community Response

A total of 315 volunteers spent 941 hours with the RVCA City Stream Watch program in 2015. Dedicated volunteers are the backbone of the program. Many volunteers participated multiple times and assisted with surveys and events on more than one creek this year.

Table 4 RVCA City Stream Watch Accomplishments 2015

Creek name	Barrhaven	Bilberry	Mosquito	Stillwater	Graham	Sawmill	Pinecrest	Nepean	Black Rapids	Jock River	Rideau River	Ottawa River	Total
Sections surveyed	15	71	75	100									**261**
Fish sites	5	7	8	10									**30**
Fish sampling sessions	13	15	17	16									**61**
Temp probes	2	3	4	7									**16**
Demonstration events	1	0	0	0						1			**2**
Training sessions	0	0	0	0	1								**1**
Stream garbage cleanups	1	2	0	0		2							**5**
Kilometres (km) Cleaned	0.25	1.5				1							**2.75km**
Invasive species removal	0	1	0	0	0	3	1	1	1		2		**9**
Square meters (m^2) of shoreline cleared of invasives		400				2700	800	2800	600		4000		**11300m^2**
Shoreline Planting				1									**1**
Adopt a Stream						yes							**Yes**
Restoration projects												1	**1**
Number of Volunteers	26	24	33	50	29	35	15	10	10	29	19	35	**315**
Number of Volunteer Hours	**52**	**89**	**117**	**180**	**58**	**70**	**30**	**20**	**20**	**116**	**49**	**140**	**941**

Volunteer Projects

Volunteer projects are carried out either for educational or rehabilitation purposes. City Stream Watch in the Rideau Valley watershed carries out the following types of volunteer projects:

- Planting trees and shrubs along stream corridors
- Removing invasive species that will outcompete native plants
- Learning about and participating in fish sampling/identification
- Learning about and participating in benthic invertebrate sampling/identification
- Stream garbage clean ups
- Habitat restoration (bioengineering, habitat creation, wetland restoration)
- Learning about flyfishing

The following is a summary of volunteer projects carried out by the RVCA in 2015. Over the course of the field season, RVCA City Stream Watch ran 18 special events outside of regular sampling.

Invasive Species Removal

Invasive species can be introduced into the environment through a variety of human and natural influences including aquarium and horticultural activities, pet trades, live bait industry, recreational boating, global shipping containers and ballast water. These species are known to have major implications for stream habitat as they can outcompete native species negatively effecting local wildlife, fish and plants.

There are a number of invasive species that have been observed along creeks in the City of Ottawa. Many are known to be very prolific and can be found along an entire stream length. In response to the growing number of invasive species observed during stream surveys, the City Stream Watch Program began removing targeted species in 2010. Removal efforts have been focused on certain species in targeted areas where volunteer removal efforts can halt the spread along the shoreline and make a significant difference in stream habitat. Special effort is made to return to targeted areas for additional removals in subsequent years and to encourage repopulation of the area by native plant species by spreading native seed mixes where appropriate.

In 2015, nine invasive species removals were carried out on six creeks by the City Stream Watch Program with support from the Community Foundation of Ottawa. The species targeted for removal this year were Himalayan Balsam, Japanese Knotweed and European Water Chestnut. The removal methods for invasive species were taken from the Ontario Federation of Anglers and Hunters (OFAH) website and local community members who have been involved in various types of removals.

City Stream Watch volunteers removing Japanese Knotweed, European Water Chestnut and Himalayan Balsam along city creeks and rivers

Figure 2 Japanese Knotweed removal along Sawmill Creek

Sawmill Creek Japanese Knotweed Removal

Three removal events took place along Sawmill Creek in June, August and September 2015. The goal of this pilot project was to see if repeated cuttings of Japanese knotweed throughout the growing season would exhaust the plant enough to reduce the extent of spread. In total, 18 volunteers spent 36 volunteer hours removing the invasive species from a 50m stretch of shoreline. Eighty garbage bags were filled and the area cleared was 900m². Native shoreline seed was dispersed to help regenerate the area and post effectiveness monitoring will be done to determine success in 2016.

City Stream Watch volunteers removing Japanese knotweed along Sawmill Creek

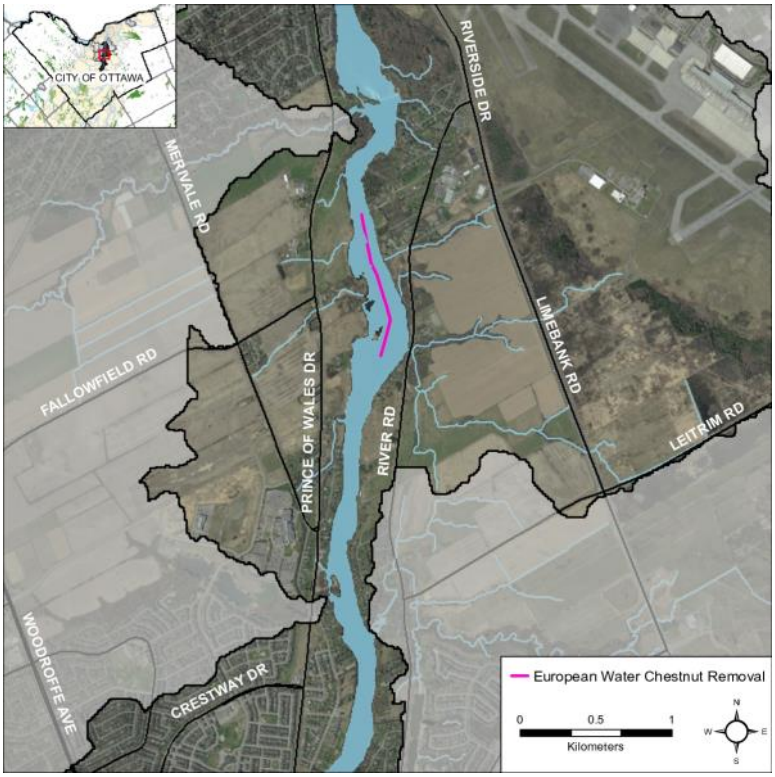


Figure 3 European Water Chestnut removal along the Rideau River

Rideau River European Water Chestnut Removal

The first sighting of European Water Chestnut on the Rideau River was reported to Ducks Unlimited Canada (DUC) in 2014. In 2015, City Stream Watch, the City of Ottawa and DUC joined forces to act fast and control the spread of the invasive species. Two removals of European Water Chestnut were organized on the Rideau River this season. Nineteen volunteers spent 49 volunteer hours in canoes and boats pulling this aquatic invasive plant. In total an impressive 2700kg of plant material was removed from a 1000m stretch of the river. Post effectiveness monitoring will be done by the City of Ottawa in 2016 and follow up removals will be planned.

Volunteers and staff from CSW, the City of Ottawa and DUC removing European water chestnut

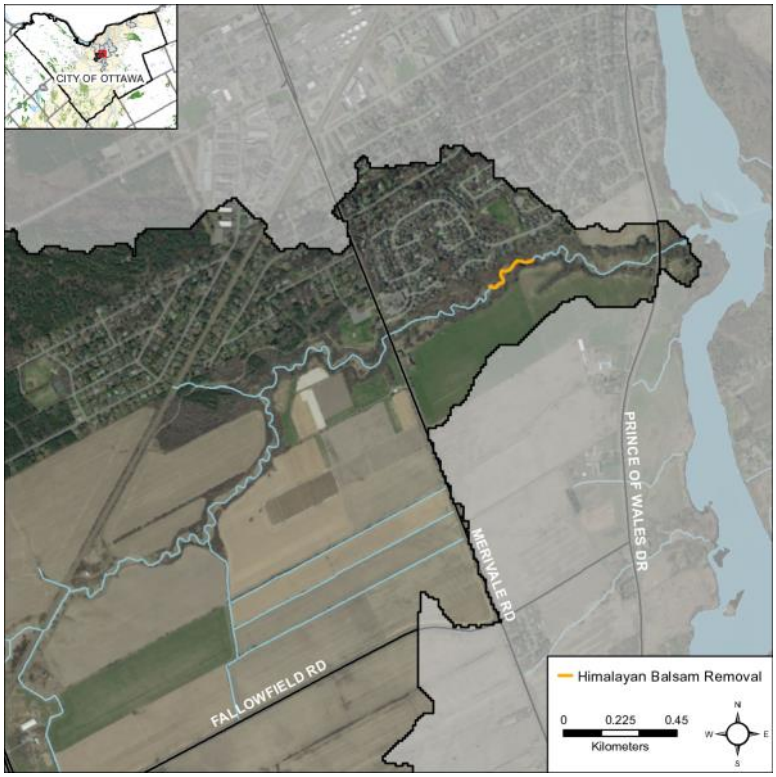


Figure 4 Himalayan Balsam removal on Black Rapids Creek

Black Rapids Creek Himalayan Balsam Removal

Patches of Himalayan Balsam were observed along Black Rapids Creek during stream surveys in 2014. This was the second year that a removal was carried out to stop the spread of this prolific species along the shoreline. Ten volunteers spent 20 volunteer hours removing the invasive species from 150m of shoreline. Post effectiveness monitoring will be carried out in 2016 to determine the success of the removals.

City Stream Watch volunteers at the Himalayan Balsam removal along Black Rapids Creek

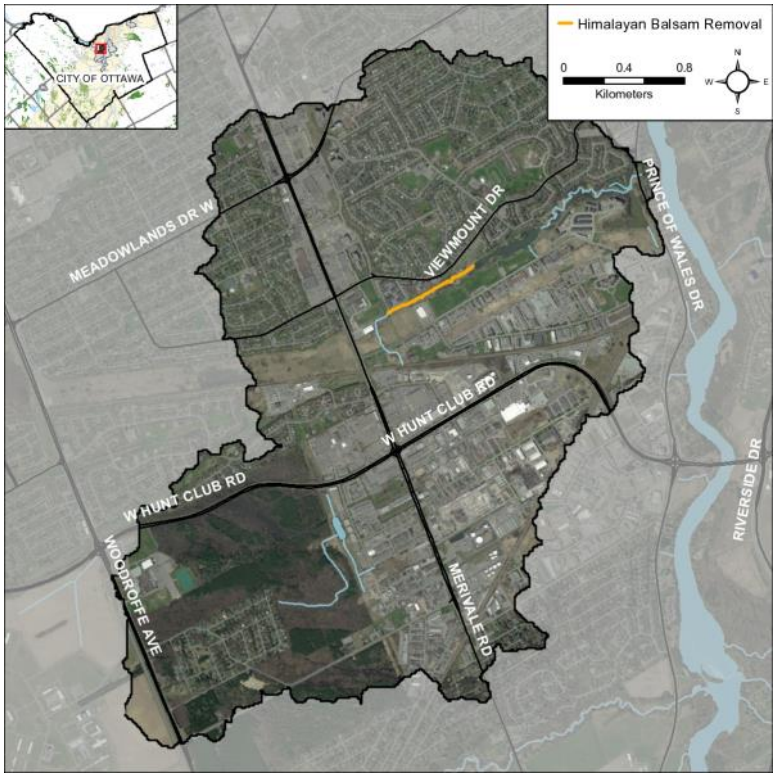


Figure 5 Himalayan Balsam removal on Nepean Creek

Nepean Creek Himalayan Balsam Removal

2015 was the third year in a row that a Himalayan Balsam removal took place along Nepean Creek. Post effectiveness monitoring showed that amounts had significantly decreased where removals had taken place in previous years so this year volunteers were able to move farther upstream to cover new territory. Ten volunteers spent 20 volunteer hours removing Himalayan Balsam from 700m of shoreline covering approximately 2,800m². Post effectiveness monitoring will be carried out again in 2016.

Volunteers removing Himalayan Balsam along Nepean Creek

Figure 6 Himalayan Balsam Removal on Pinecrest Creek

Pinecrest Creek Himalayan Balsam Removal

Himalayan Balsam is well established along Pinecrest Creek, covering much of the riparian area at the south end of the creek. Each year the City Stream Watch program plans removal events to help control the spread of this species. Post effectiveness monitoring has shown some reduction in amounts of Himalayan balsam but the plant is still extremely prolific. This season, fifteen volunteers spent 30 volunteer hours removing Himalayan Balsam from a 200m length of shoreline along Pinecrest Creek. In total, balsam was pulled from approximately 800m² of the riparian area which was seeded with native seed to help with regeneration.

Volunteers removing Himalayan Balsam along Pinecrest Creek

Figure 7 Himalayan Balsam Removal on Bilberry Creek

Bilberry Creek Himalayan Balsam Removal

Himalayan Balsam was observed in many sections during stream surveys this year on Bilberry Creek. City Stream Watch staff and volunteers returned to one of the densest patches of balsam this year to remove the plants. At this event, three volunteers spent 6 volunteer hours removing balsam from 100m of shoreline and dispersing native seed. Post effectiveness monitoring will be carried out in 2016.

Volunteers removing Himalayan Balsam along Bilberry Creek

Stream Garbage Cleanups

Each year City Stream Watch plans stream garbage cleanups to remove debris of human origin from the creeks and shorelines where it is needed most.
In 2015, five stream garbage cleanups took place along three different creeks. Two cleanups were carried out on both Sawmill Creek and Bilberry Creek and one cleanup took place along Barrhaven Creek. In total, approximately 2.75km of creek length and shoreline was cleared of garbage.

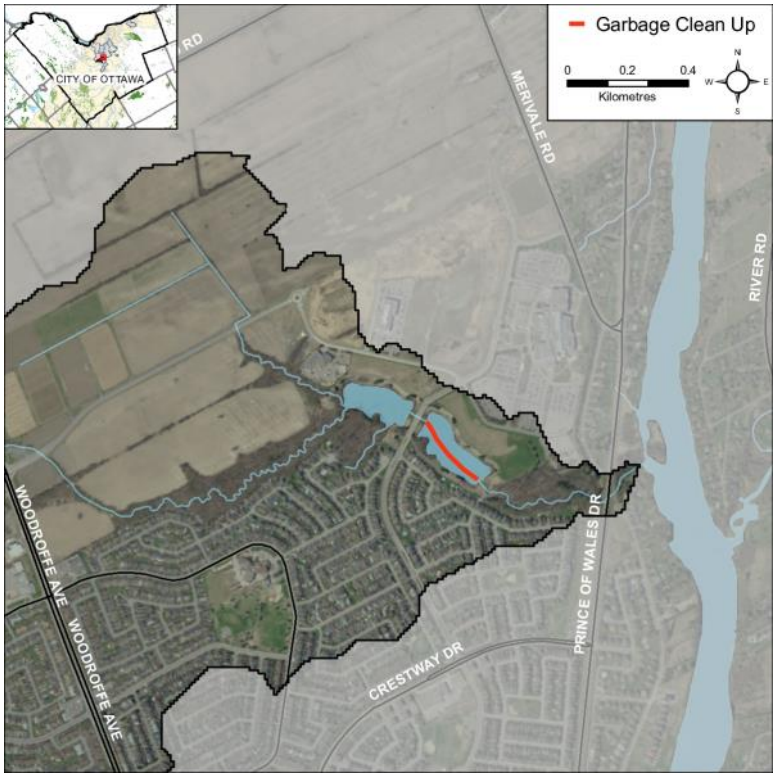


Figure 8 Stream garbage cleanup on Barrhaven Creek

Barrhaven Creek— Cleanup and Demonstration Event

In May, a group of local Girl Guides and Brownies joined City Stream Watch for a cleanup and demonstration event near the stormwater pond on Barrhaven Creek. The group learned about fish sampling techniques and got to see some of the fish species that live in the creek first hand before spreading out to clean up the shoreline. The event was part of the Great Canadian Shoreline Cleanup. Covering approximately 250m of shoreline, the group of enthusiastic young environmentalists filled about 10 garbage bags.

Left: Volunteers learning about the various fish species living in Barrhaven Creek

Right: volunteers cleaning up the shoreline

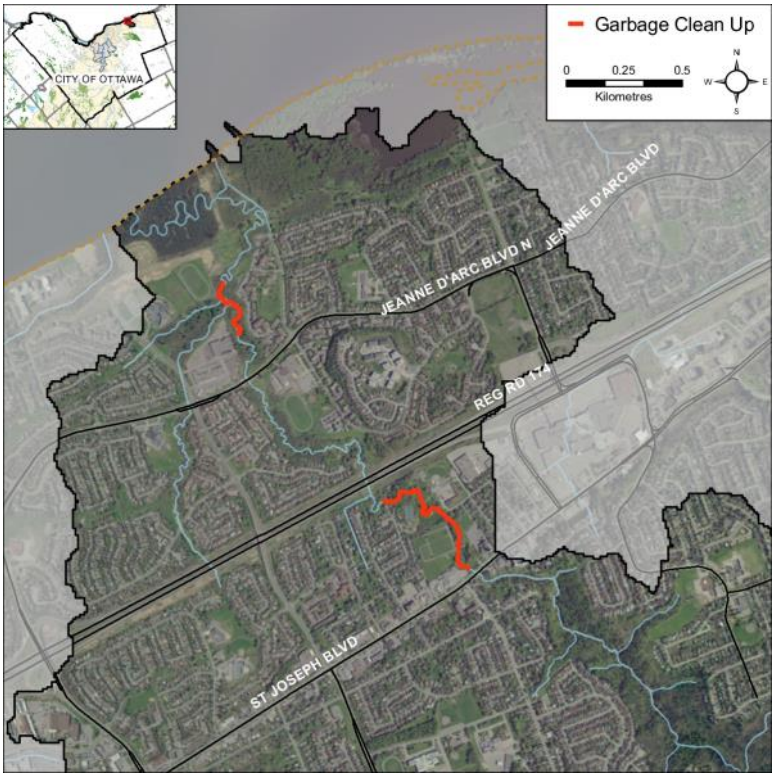
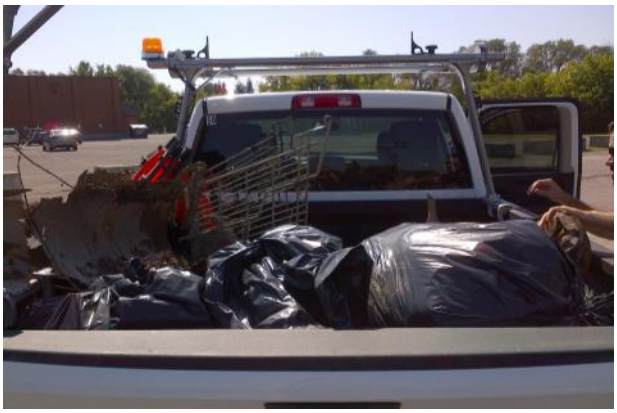


Figure 9 Stream garbage cleanup on Bilberry Creek

Bilberry Creek Cleanups

During stream surveys this year staff and volunteers noted many spots along Bilberry Creek which were in need of a stream cleanup. Following the observations, the two locations that were targeted in the fall were Pierre Rocque Park and downstream of Jeanne D'Arc Boulevard. Two volunteers contributed four volunteer hours to the cleanups removing shopping carts, scrap metal, wrappers and plastics from the creek.



Garbage collected from Bilberry Creek

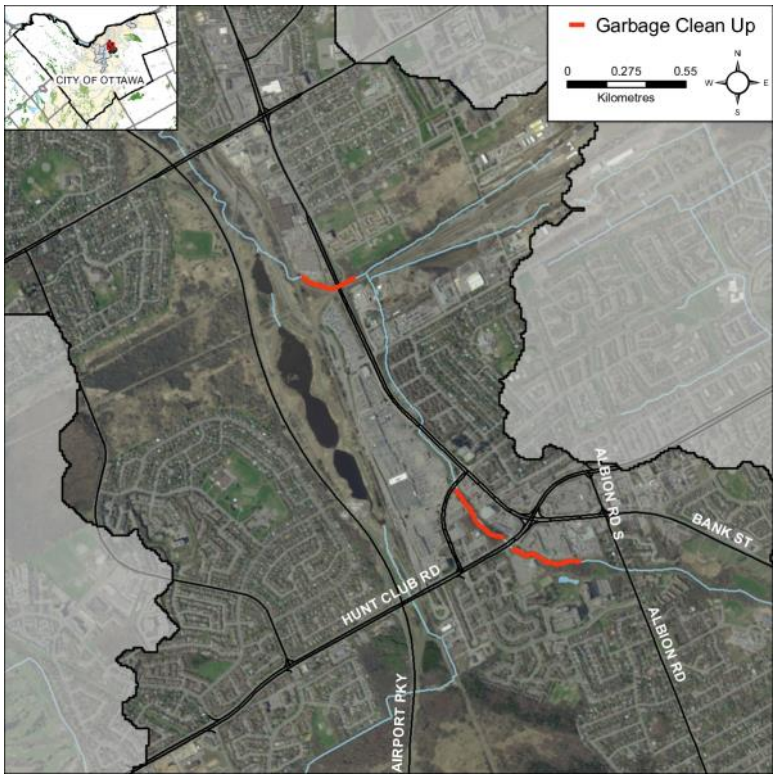


Figure 10 Stream garbage cleanup on Sawmill Creek

Sawmill Creek Cleanups

Sawmill Creek is targeted every year for cleanups due to its location in the urban center where it is subject frequent garbage accumulation. This season two cleanups took place on Sawmill Creek focusing on the area around the Towngate Shopping Centre, downstream of Hunt Club Road, and near the Home Depot on Bank Street. Seventeen volunteers spent 34 volunteer hours cleaning up the stream and banks at the various sites this season.

City Stream Watch volunteers at the fall cleanup

Shoreline Planting and Restoration Projects

Stillwater Creek Shoreline Planting

In May, the Shoreline Naturalization Program and City Stream Watch volunteers returned to a past planting site along Stillwater Creek at the Abbott-Point-of-Care campus. The group planted semi-mature trees to enhance the existing shoreline revitalization project where various trees and shrubs had been planted in previous years. Seven volunteers contributed a total of 21 volunteer hours to the project.

Remic Rapids Wetland Creation Project

The Rideau Valley Conservation Authority (RVCA) partnered with the National Capital Commission (NCC) to design and construct a wetland adjacent to the Ottawa River. The new wetland feature is located close to Remic Rapids along the Sir John A. Macdonald Parkway. The feature is an area of 0.15 hectares consisting of a shallow water basin wetland that supports amphibian breeding and bird foraging and acts as a water supply for wildlife. The project required excavating a low lying grass/cattail area adjacent to the Ottawa River to create a functional wetland habitat feature in the Ottawa River watershed. A variety of habitat features were implemented within the wetland design to support for species diversity. These design elements include:

- Varying water depths and grades (slopes) to accommodate for a variety of plant communities
- The use of wood structure in the form of root wads, sweeper trees and basking logs to provide basking areas for turtles, shelter for waterfowl rearing their young and reproductive areas for amphibians and aquatic insects
- The installation of a sand/pea stone mix to provide for turtle nesting areas along the perimeter of the wetland feature

In September, volunteers joined RVCA and NCC staff to plant 385 shrubs and trees around the new newly constructed wetland feature. The group also seeded the wetland with a wetland seed mix and the upper banks were seeded with a shoreline seed mix. A total of 35 volunteers participated for 140 volunteer hours.

Volunteers planting at Remic Rapids

The Remic Rapids community planting day

Workshops and Demonstrations

Workshops and demonstrations are an important and popular part of the City Stream Watch program because they give volunteers the opportunity to learn how to identify various fish species and benthic invertebrates that are present in our watershed as well as the sampling methods that RVCA staff use in the field.

The Ultimate Aquatic Workshop

On October 17th, volunteers and fly fishers braved the mid autumn cold to attend the popular Ultimate Aquatics Workshop at the Jock River Landing Park. This event is a collaboration between City Stream Watch and the Ottawa Flyfishers Society (OFS) which gives volunteers the unique opportunity to learn about benthic invertebrate identification and fly fishing all in the same day. The Ottawa Flyfishers Society was formed in 1983 to unite local area fly fishers. The Society is dedicated to fostering and furthering the practice of activities associated with the art of fly fishing, conservation and resource renewal.

RVCA staff explaining how to identify benthic invertebrates

Despite the cold temperatures (and a few snow flurries!), 29 volunteers, dedicated 116 hours to the workshop. Included in the workshop were the following contributions from RVCA staff and OFS members:

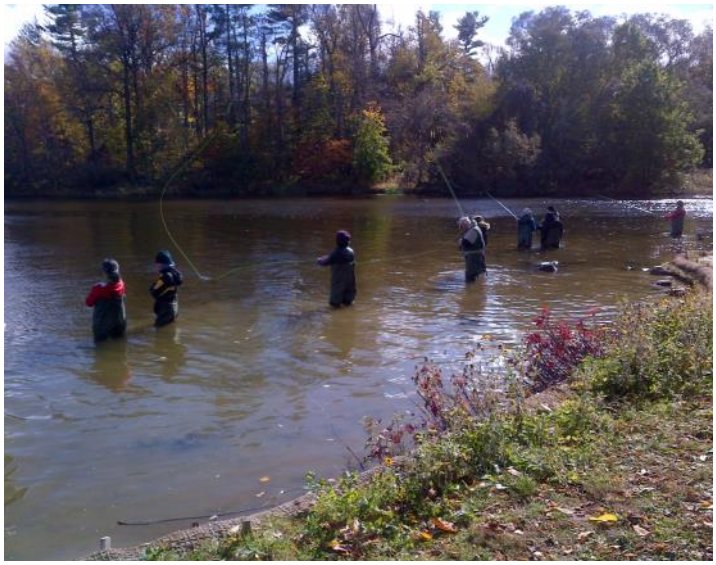
Rideau Valley Conservation Authority staff:

- Introduced the basics of the OBBN protocol (Ontario Benthos Biomonitoring Network), how to survey, process and identify benthos to order level.
- Assisted volunteers in sampling and identifying the benthic invertebrates

OFS members:

- Explained the relationship between stream functions, habitat, benthos and their importance to fish and fly fishing
- Gave an introduction to fly fishing and provided samples of fly ties
- Paired up with volunteers to provide hands on instruction in fly casting and experience

Volunteers checking a net for benthic invertebrates



Volunteers getting instruction on fly casting from members of the Ottawa Flyfishers Society

RVCA Plans for 2016

In 2016, City Stream Watch will be monitoring the following creeks:

- Brassils Creek
- Graham Creek
- Greens Creek
- McEwan Creek

There will be many opportunities to assist with:

- Stream habitat surveys
- Fish community sampling
- Bioengineering projects
- Stream garbage cleanups
- Riparian planting
- Invasive species removals
- Workshops and demonstrations
- Habitat restoration

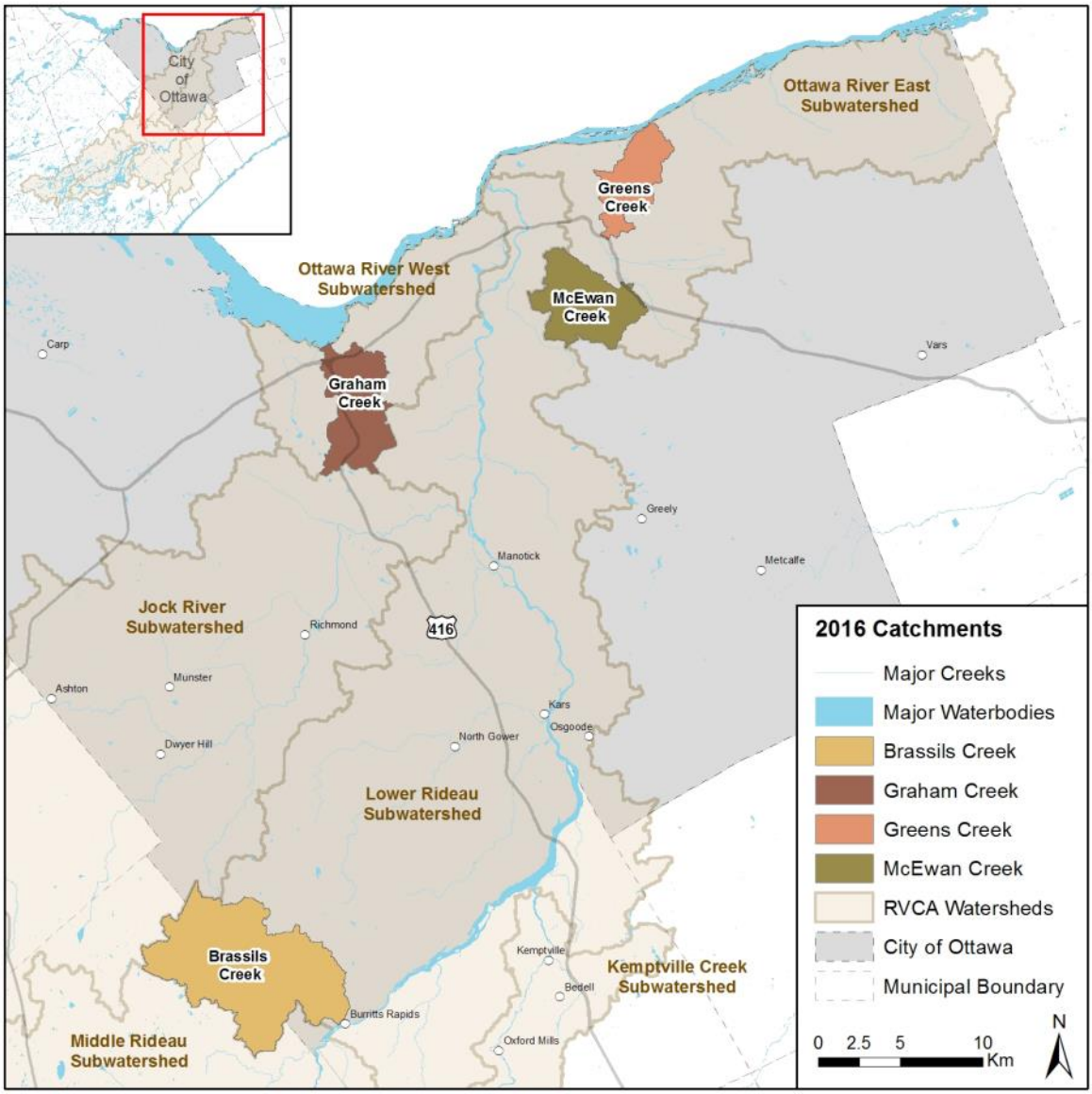


Figure 11 Location of RVCA 2015 monitoring activities

To volunteer with RVCA's City Stream Watch program, please contact:
City Stream Watch Coordinator
613-692-3571
citystreamwatch@rvca.ca
http://www.rvca.ca/programs/streamwatch/index.html

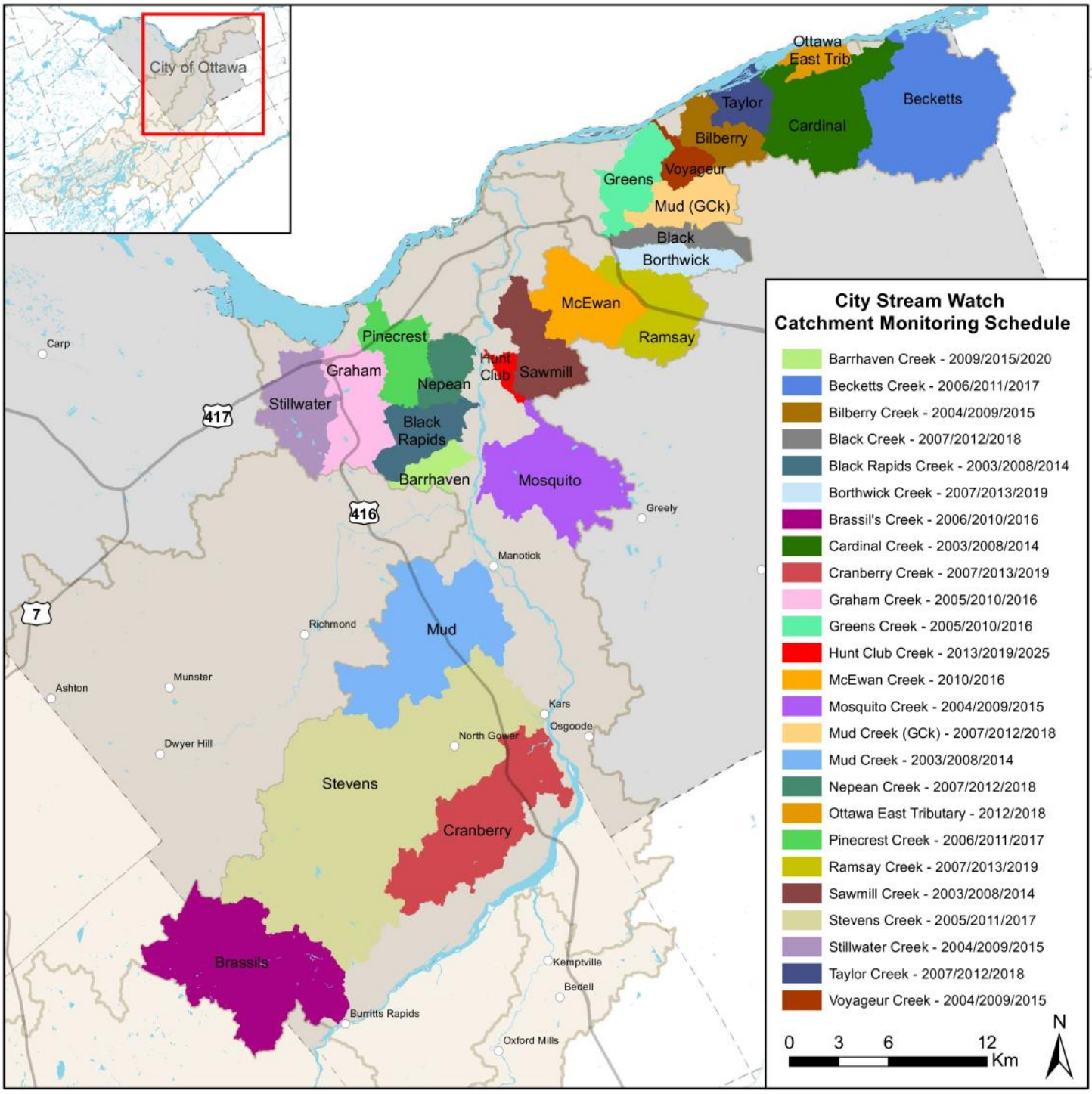


Figure 12 Locations and schedule of RVCA City Stream Watch monitoring activities

SNC City Stream Watch 2015 Summary

The *SNC City Stream Watch 2015 Summary Report* highlights achievements from the 2015 field season and describes the scope and magnitude of projects which were completed by SNC staff and community volunteers. This is the second year for the City Stream Watch program at SNC and we are very pleased with the degree of uptake by the local communities and the development of the program since its initiation in 2014. Overall, a total of 155 volunteers participated with City Stream Watch and contributed to the survey and monitoring of 12.4 km's of streams; nearly double what was surveyed in 2014! SNC's City Stream Watch Reports are available online at: http://www.nation.on.ca/water/reports.

Stream Study

The City Stream Watch program for SNC targeted the North Castor River, a tributary of the Castor River, for the 2015 field season in addition to other areas within the Castor River Subwatershed. The North Castor River begins northeast of Greely at the confluence of Shields and Findlay Creek (Figure 13). It flows southeast towards Russell, ON across both agricultural and forested land before entering the main branch of the Castor River west of Russell. Landowners on both banks of the North Castor River were contacted prior to beginning field surveys in order to gain access permission along the entire length of the stream. In total, 66 landowners were contacted and 100% allowed access to the stream and permission to complete surveys along the stream banks. Consequently, SNC staff and volunteers were awarded a valued chance to survey the entire North Castor River and obtain important data on a stream-wide scale.

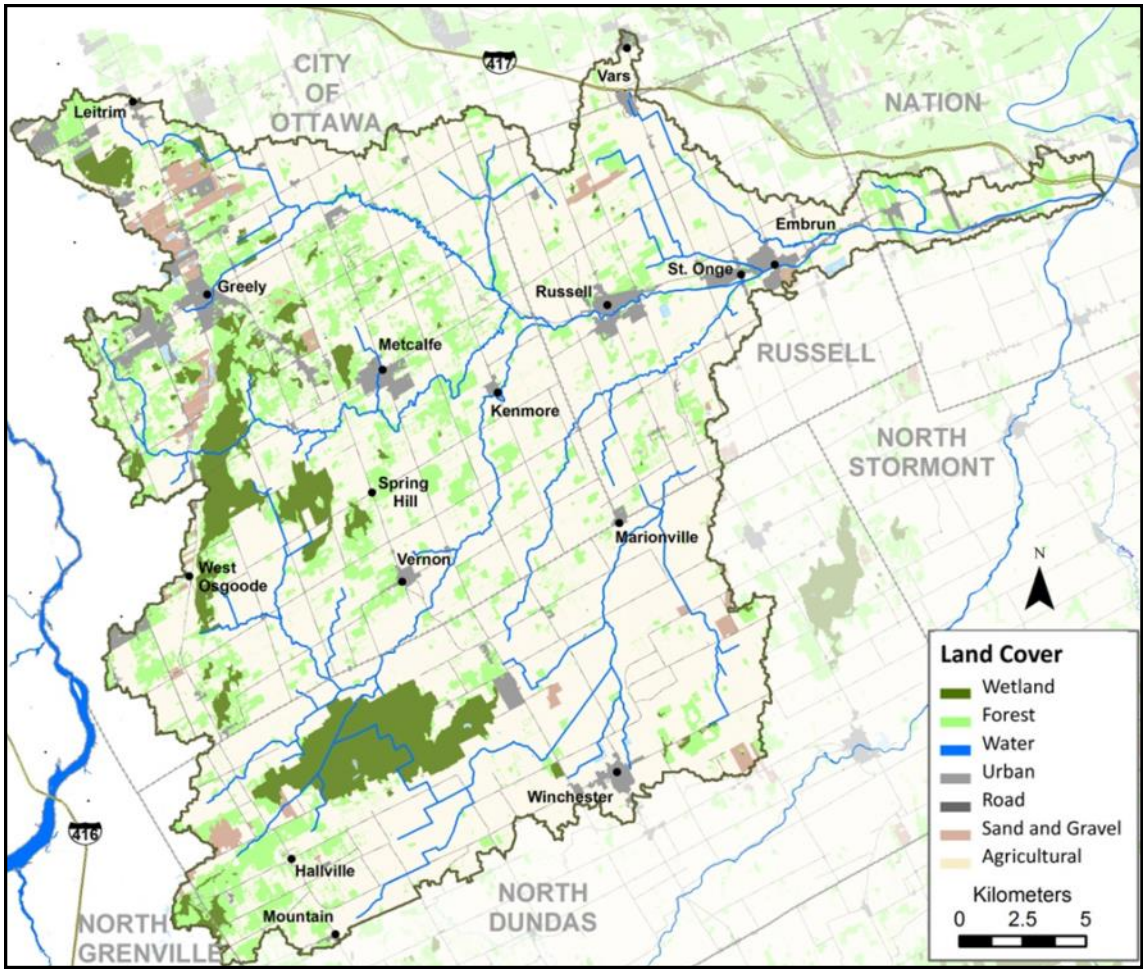


Figure 13 The Castor River Subwatershed.

Volunteer Contributions

A total of 155 volunteers assisted with the SNC City Stream Watch program in 2015 for over 653 hours of work. Numbers of volunteers that contributed during the 2015 City Stream Watch program were similar to those obtained in 2014. Specifically, the 2014 season attracted 152 volunteers. SNC staff and volunteers were able to complete projects such as stream garbage cleanups, riparian tree planting days, invasive species monitoring and fish sampling surveys. Without volunteer assistance, SNC staff would not have been able to complete nearly as much stewardship work as was accomplished. Table 5 displays a summary of the SNC City Stream Watch accomplishments for the 2015 field season and details of volunteer assistance.

Table 5 A summary of SNC's City Stream Watch accomplishments for the 2015 field season and volunteer contributions.

Activity	North Castor River
Sections surveyed	124
Fish sites	6
Fish sampling sessions	3
Temperature probes deployed	6
Demonstration events	1
Stream garbage cleanups	2
Kilometers (km) of stream cleaned	1.5 km
Invasive species monitoring sites	3
Riparian plantings	1
Number of volunteers	155
Number of volunteer hours	653

Student volunteers from St-Thomas Aquinas High School in Russell and Castor River Elementary School in Embrun took to the riparian areas of the Castor River in order to re-forest and stabilize streambanks.

Volunteers from Le Club Richelieu provided lunch for workers during a riparian tree planting event.

Volunteer, Demonstration, Stewardship, and Monitoring Projects

Volunteers under the City Stream Watch program assisted with a number of different activities and were also presented with educational opportunities. Specifically, the following events took place in 2015 and were organized by SNC:

- Etienne Patenaude Tree Planting
- Benthic Invertebrate Sampling Demonstration
- Fisheries and Invasive Species Sampling
- Cache-in Trash-out Stream Clean-up

Below are descriptions and photographs of each of the aforementioned events.

Figure 14 Location of Etienne Patenaude Tree Planting day. Areas that were planted are contained within the red boundaries.

Etienne Patenaude Tree Planting

On May 14th, 2015, 65 students from St-Thomas Aquinas High School in Russell and Castor River Elementary School in Embrun assisted with planting over 1000 trees along the Castor River. White Spruce, Norway Spruce, Tamarack, and Balsam Fir trees were planted with the objectives of increasing wildlife habitat, stabilizing stream banks, and increasing water quality through reductions in water temperature by shading. Additionally, the landowner will begin to receive soil and crop protection from wind by establishing wind breaks.

Volunteers from Le Club Richelieu took care of lunch for the student volunteers.

Student volunteers working to plant over 1000 trees at the Etienne Patenaude Tree Planting day.

Students learning about the Ontario Benthos Biomonitoring Network protocols.

Benthic Invertebrate Sampling Demonstration

After planting over 1000 trees at the Etienne Patenaude Tree Planting day, SNC employees used the opportunity to educate 65 young people about benthic invertebrates and what they tell us about the health of a stream. SNC employees applied techniques from the Ontario Benthos Biomonitoring Network to display how the protocol works. After, benthic invertebrates were placed in containers so that volunteers and interested people could view them

SNC employee showing two interested students benthic invertebrates on the underside of a large stone.

A SNC employee works to sort fish and crayfish while completing fisheries and invasive species monitoring.

Fisheries and Invasive Species Sampling

Fisheries monitoring was completed during City Stream Watch at 6 different sites along the North Castor River over the course of 3 days. Monitoring was completed using minnow traps, fyke nets, and seine netting. Species of fish caught included white sucker, small-mouth bass, and northern pike. Invasive rusty crayfish sampling was completed at 3 different sites in the Castor River Subwatershed in 2015. Fortunately, no rusty crayfish were discovered at the 3 different sites.

A volunteer views fish that were caught while sampling.

SNC staff offering a choice of tree species to a resident of Findlay Creek.

Cache-in Trash-out Stream Clean-up

A Cache-in Trash-out Stream Clean-up day was held at Findlay Creek as part of City Stream Watch in the spring of 2015. Geocachers from all over the watershed met up to assist SNC staff with a garbage clean-up of Findlay Creek. Additionally, a tree giveaway was held where residents could grab themselves a free shrub or coniferous tree. At the end of the day, volunteers managed to gather a large amount of garbage including tires, insulation, old fuel cans, and a construction pylon.

Findlay Creek

Volunteers picked up enough trash out of Findlay Creek to create a mountain of garbage!

SNC Plans for 2016

In 2016, SNC City Stream Watch efforts will be focused on McKinnon's Creek. McKinnon's Creek is located north-west of Navan and flows south-east through Navan before entering the Bear Brook River (Figure 18). McKinnon's Creek is an ideal area for City Stream Watch and its projects due to its proximity to large urban centers, development in its headwater areas, and the varied landscape through which it flows (urban, agricultural, and forested).

There will be many opportunities to assist with City Stream Watch in 2016 including:

- Tree Planting Projects
- Invasive Species Removal
- Habitat Enhancement Projects
- Fish and Benthic Sampling Activities
- Stream Monitoring
- Garbage Clean-ups

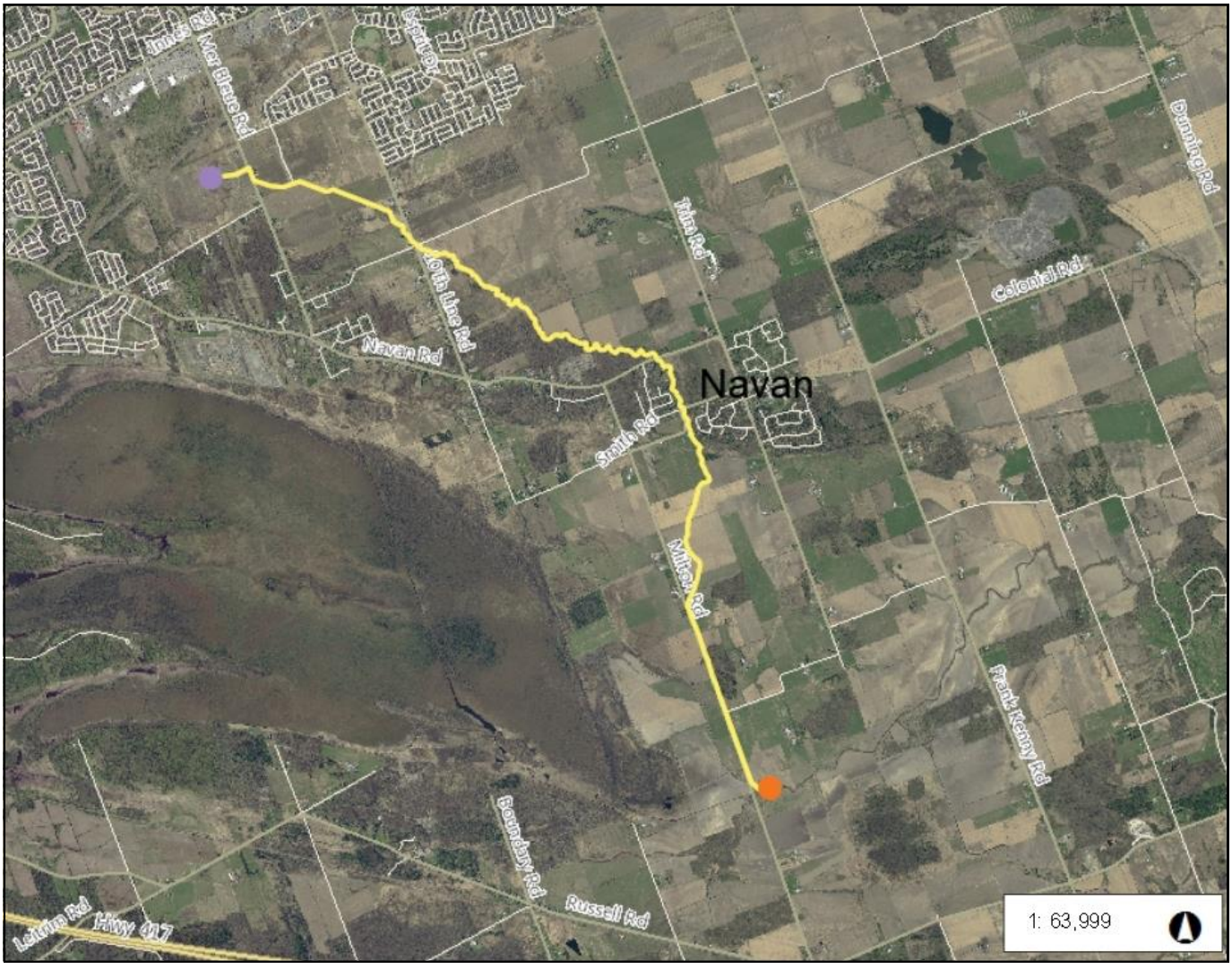


Figure 15 McKinnon's Creek (yellow line) flows from headwaters (purple dot) north-west of Navan to south of Navan where it meets the Bear Brook River (orange dot).

To volunteer with SNC's City Stream Watch program, please contact:

City Stream Watch Coordinator

South Nation Conservation

613-984-2948

info@nation.on.ca

Acknowledgements

A big thank you to all of our 2015 volunteers. You continue to make the program a success and contribute to important rehabilitation and data collection projects along our urban and rural streams within the City of Ottawa.

Thank you to the City Stream Watch collaborative for continuing with their program guidance, ideas, volunteer recruitment and help!

Thank you to all media outlets for helping to spread the word about City Stream Watch events.

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GLOSSARY OF ACRONYMS
CCME - Canadian Council of Ministers of the Environment. Provide Canadian Environmental Quality Guidelines (CEQG's)
DUC - Ducks Unlimited Canada
FCR - Friends of the Carp River
MNRF - Ministry of Natural Resources and Forestry
MVCA - Mississippi Valley Conservation Authority
NCC - National Capital Commission
NHIC - Natural Heritage Information Centre
NRVIS - Natural Resources and Values Information System
OBBN - Ontario Benthos Biomonitoring Network
OFAH - Ontario Federation of Anglers and Hunters
OFS - Ottawa Flyfishers Society
OSAP - Ontario Stream Assessment Protocol
PWQO - Provincial Water Quality Objectives
RVCA - Rideau Valley Conservation Authority
SNC - South Nation Conservation
TRCA - Toronto Region Conservation Authority