



City Stream Watch 2012

Summary Report



City Stream Watch 2012

Black Creek Mud Creek (GCK) Nepean Creek
Ottawa East Tributary Taylor Creek



Page 1

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La table ronde sur la Rivière
Rideau
River Roundtable

Heron Park
Community Association



National
Defence

Défense
nationale

Canada

Thank you to our 2012 Funding Partners:

Ontario Ministry of Natural Resources, Community Fisheries and Wildlife Involvement Program

A total of \$2,000 was received from the CFWIP for the Graham Creek Restoration Project. Funds were used to purchase bioengineering materials, refreshments for volunteers and native trees, shrubs and wildflowers.

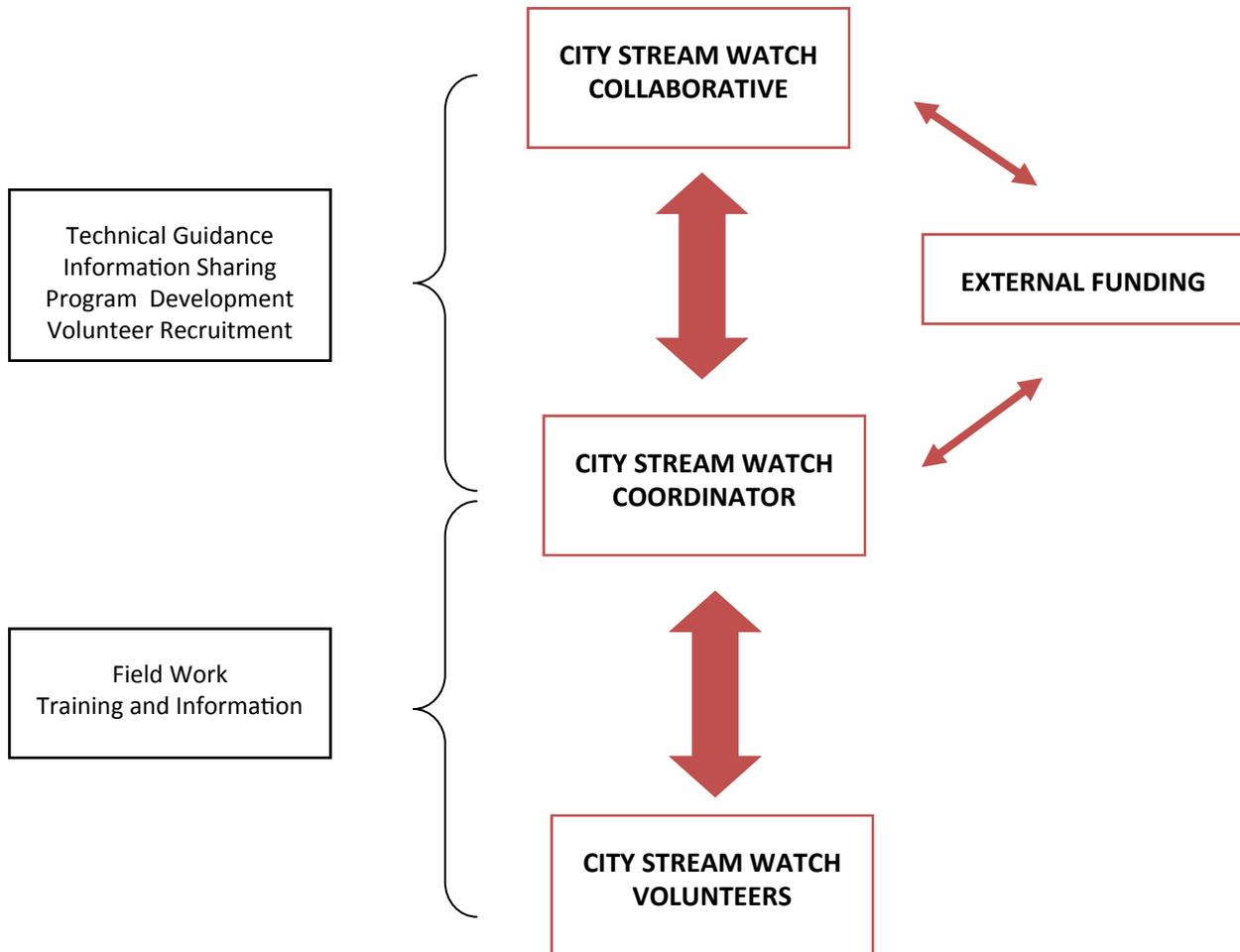
Walmart-Evergreen, Green Grant

Walmart-Evergreen awarded a total of \$8,000 to the Rideau Valley Conservation Foundation in Partnership with City Stream Watch and the Shoreline Naturalization Program to support the Graham Creek Restoration Project





City Stream Watch Organizational Chart





Introduction

The City Stream Watch program was initiated in 2003 by the Heron Park Community Association, National Defence HQ – Fish and Game Club, Ottawa Flyfishers Society, Rideau Roundtable, City of Ottawa and Rideau Valley Conservation Authority.

The program has two goals:

- To provide long-term documentation of the aquatic and riparian conditions in our watershed;
- To involve, inform and motivate the public so that our urban and rural streams are more valued, respected and cared for and to ensure that our streams remain a point of pride in our communities.

RVCA, in partnership with the City of Ottawa, National Capital Commission, OMAFRA, Parks Canada, Fisheries and Oceans, North Grenville, Ministry of Natural Resources and Ministry of Environment collaborated to develop the *Lower Rideau Strategy*. The *Lower Rideau Strategy* lists a number of environmental issues and/or threats along many of the tributaries, including poor water quality, loss of vegetation (including wetlands and forest), loss of biodiversity, changes in hydrology and stream alterations, such as channelization or shoreline hardening. The report recommends 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 also the 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.

The program conducts stream habitat surveys on 25 watercourses in the City of Ottawa and each stream is monitored every six years. Volunteers, guided by an experienced coordinator and technician, help to collect field data and participate in other activities such as sampling fish communities through seining and electrofishing, aquatic invertebrate sampling, stream garbage clean-ups and habitat rehabilitation projects. Figure 2, on page 6, is a map with the stream locations and corresponding year that City Stream Watch monitors. In the years between survey cycles, streams can be monitored by volunteers through Adopt-A-Stream, an additional City Stream Watch program.

Stream Habitat Assessment Methodology

The City Stream Watch program uses a macro stream assessment protocol for surveying streams. The protocol was originally used by the Ontario Ministry of Natural Resources, but has been modified by the RVCA to make it more effective for RVCA monitoring purposes. In 2008, changes were made to the field sheets to provide more detail in the stream data. Each stream is monitored every six years to help track changes over the long term. 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

Fish Sampling Methodology

Due to different habitat characterizations along the length of a stream, a variety of fish sampling methods can be used to identify which species are present at the sites so that a number of habitat types can be sampled. Fish sampling is done in accordance with protocols or best practices in order to live release the fish after sampling is finished. Due to the nature of the streams sampled in 2012, electrofishing was the only method used to capture fish in 2012.

Seine net

- 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

- 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

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 Stoneman and Jones method) to classify a watercourse as either warmwater, coolwater or cold water.

Status	Water Temperature
Cold	<19 Degrees Celsius
Cool	19-25 Degrees Celsius
Warm	>25 Degrees Celsius

Table 1. Water Temperature Classification (Minns et al. 2001)



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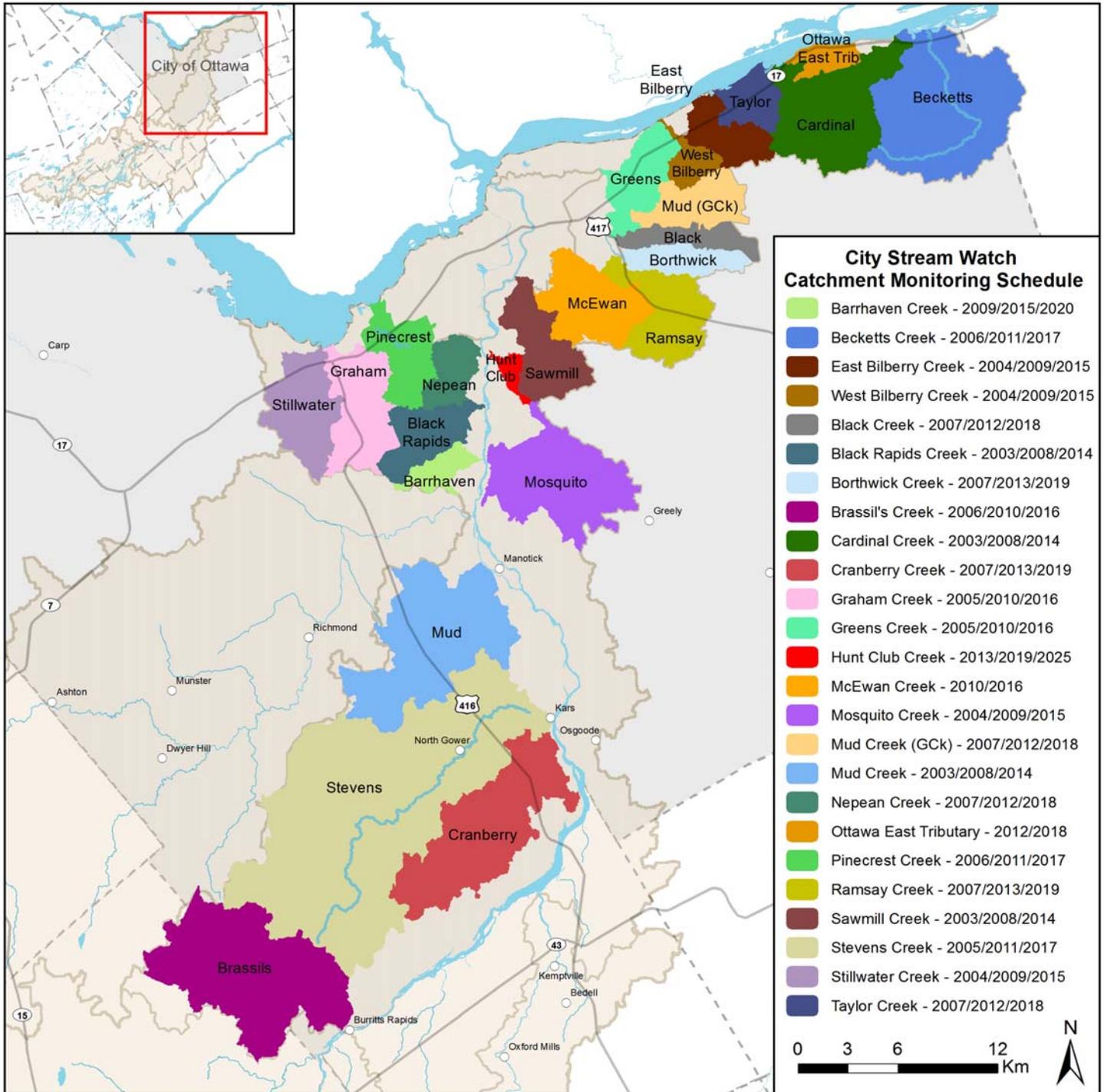


Figure 1. Locations and schedule of City Stream Watch monitoring activities



2012 Summary

The *City Stream Watch 2012 Summary Report* highlights accomplishments from the 2012 field season and describes the nature and extent of volunteer projects. To find information collected on the 2012 streams surveyed (Black Creek, Mud Creek (GCK), Nepean Creek, Ottawa East Tributary, Taylor Creek), please see their individual summary reports. These are shared on our website at: <http://www.rvca.ca/programs/streamwatch/index.html>

A total of **194** volunteers from the community participated in the program throughout the field season, contributing a total of **1,162** hours working on various projects. Approximately **17.6** kilometres of stream were surveyed in 2012.

Stream Study/Comparison

The following chart is a comparison summary of activities done on Black Creek, Mud Creek, Nepean Creek and Taylor Creek in 2007 and 2012. Ottawa East Tributary was studied for the first time in 2012 so a comparison is not possible. Volunteer numbers and hours continue to increase as the program has incorporated more activities and gained greater recognition within the community. In 2007, there were approximately 120 volunteers and over five years, that number has grown to over 250. Overall, each stream experienced changes within the stream cycle. Anthropogenic alterations have increased on Nepean Creek, Black Creek and Taylor Creek. The amount of garbage increased on Nepean Creek and Taylor Creek. There was an improvement of erosion levels on Mud Creek and Taylor Creek overall, although Mud Creek displayed an increase in sites with extreme erosion and bank instability. The most notable change was an increase in number and types of invasive species on each creek. Since 2007, the City Stream Watch Program has increased focus and knowledge on identification of invasive species. This increased effort could be attributed to some of the increased observations, but overall, invasive species appear to be increasing on the streams surveyed.

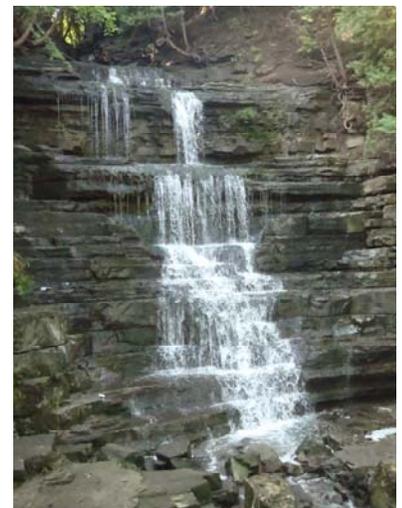
Activities	Black Creek 2007	Black Creek 2012	Mud Creek 2007	Mud Creek 2012	Nepean Creek 2007	Nepean Creek 2012	Taylor Creek 2007	Taylor Creek 2012
Number of sections surveyed	33	36	62	87 (including tributary)	18	20	15	17
Number of volunteers	N/A	21	N/A	38	N/A	27	N/A	21
Total volunteer hours	32	79	58	119	49	85	60	58
Number of fish sampling events	1	6	0	6	7	10	0	4
Number of temperature probes	2	2	2	2	2	3	2	2

Table 2. Stream study comparison between 2007 and 2012
N/A: in 2007 volunteer numbers were not tracked by creek

Data Management

All data collected is maintained in the Rideau Valley Conservation Authority database. 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:

- RVCA lower Rideau catchment reports to be released in 2013
- Identifying potential rehabilitation projects (riparian and instream)
- Analyzing program success
- Background data for RVCA *Fisheries Act* Review, RVCA *Planning and Regulations* Review and subwatershed plans
- Reports or information for other agencies (National Capital Commission, City of Ottawa, Fisheries and Oceans Canada, Ministry of Natural Resources, Ministry of Environment, etc.), consultants and non-governmental organizations
- Other projects (RVCA species at risk project), etc.
- Fish community information sent to OMNR (stored in NHIC/NRVIS databases)
- Reports to public landholders on potential projects, important issues and current conditions
- Sharing with the public on our website



Princess Louise Falls on Taylor Creek



City Stream Watch 2012 Summary Report

The Community Response

A total of 194 volunteers spent 1,162 hours with the City Stream Watch program in 2012. The volunteers are the backbone of the program. Many volunteers participated in surveys and events on more than one creek. The 194 volunteers do not include Scout groups that participated in some events.

	Ottawa East Tributary	Nepean	Mud	Mud Trib	Taylor	Black	Sawmill	Bilberry	Stevens	Jock	Stillwater	Graham	Green's	Total
Sections surveyed	16	20	61	26	17	36	..	..	..	..	..	..	..	172
Fish sites	1	3	2	1	1	2	..	..	..	..	..	..	..	10
Fish sampling events	4	10	6	1	4	6	..	..	..	..	..	..	..	31
Temp probes	2	3	2	0	2	2	..	..	..	..	..	..	..	11
Demonstration events	0	0	0	0	0	0	..	..	..	2	..	1	..	3
Training sessions	0	0	0	0	0	0	1	..	..	..	..	..	..	1
Stream garbage cleanups	0	0	0	0	1	0	2	..	..	..	..	1	2	6
Kilometres (km) Cleaned	0	0	0	0	0.5	0	2	..	..	..	..	0.5	0.5	3.5
Riparian plantings	0	1	0	0	0	0	1	1	1	..	..	..	..	4
Invasive species removal	0	0	0	0	0	0	..	..	..	..	1	1	1	3
Adopt a Stream	..	..	..	..	..	..	yes	..	..	..	..	..	yes	2
Restoration projects	0	0	0	0	0	0	..	..	..	..	..	1	..	1
Number of Volunteers (total for all events)	9	28	38	8	21	21	62	9	9	62	16	40	20	343**
Number of Volunteer Hours	38	85	119	25	58	79	190	20	34	250	64	151	49	1162***

Table 3. City Stream Watch Accomplishments 2012

.. Not in the monitoring cycle for 2012; only special events were held on these creeks

** Many volunteers participated multiple times; actual total volunteer count is 194 not including Scout groups

*** Total volunteer hours does not include Scout groups



Ottawa East Tributary



Nepean Creek



Mud Creek



Taylor Creek



Black Creek



Volunteer Projects

Volunteer projects are carried out either for educational or rehabilitation purposes. Volunteer projects include:

- 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
- Bioengineering (erosion control using structures made from native plant material)
- Learning about flyfishing

The following is a summary of volunteer projects carried out in 2012. Over the summer, City Stream Watch ran 17 special events outside of regular sampling.

Riparian Planting

Four shoreline planting projects took place in 2012. Each shoreline planting was done in partnership with the Rideau Valley Conservation Authority's Shoreline Naturalization Program. Using monitoring data from City Stream Watch, several tributaries within the urban area were chosen as priority sites for shoreline plantings.

Working closely with private landowners, businesses and agencies, shorelines along Sawmill Creek, Stevens Creek, Bilberry Creek and Nepean Creek were naturalized with help from community groups and volunteers. Overall, 58 City Stream Watch volunteers (not including Scout groups) spent 201 hours planting native shrubs and trees to improve the shorelines along these systems.

- Riparian zones are the vegetated transition areas between aquatic and terrestrial habitat and are a critical aspect of stream health
- Riparian zones protect surface water from polluted runoff, siltation and help mitigate erosion and are referred to as the "ribbon of life" due to the high amount of biodiversity found along shorelines.
- Riparian zones offer very important habitat for many fish and wildlife species.
- It is crucial for landowners who live around water to leave a natural buffer of vegetation between their property and the water edge.
- For more information on how to naturalize your property, visit "Living By the Water Project" on the web at: <http://www.livingbywater.ca/main.html>.
- For more information on the RVCA's Shoreline Naturalization Program, visit: http://www.rvca.ca/programs/RVCA_Shoreline_naturalization.pdf



Planting along Stevens Creek



A planting demonstration for Scouts at Bilberry Creek



Figure 2. Bilberry Creek riparian planting

Bilberry Creek Riparian Planting

Approximately 400 native trees and shrubs were planted along Bilberry Creek in Pierre Rocque Park this spring. With help from a number of local Scout groups, nine City Stream Watch volunteers spent 20 hours planting, watering and carrying soil.



Planting trees and shrubs along Bilberry Creek

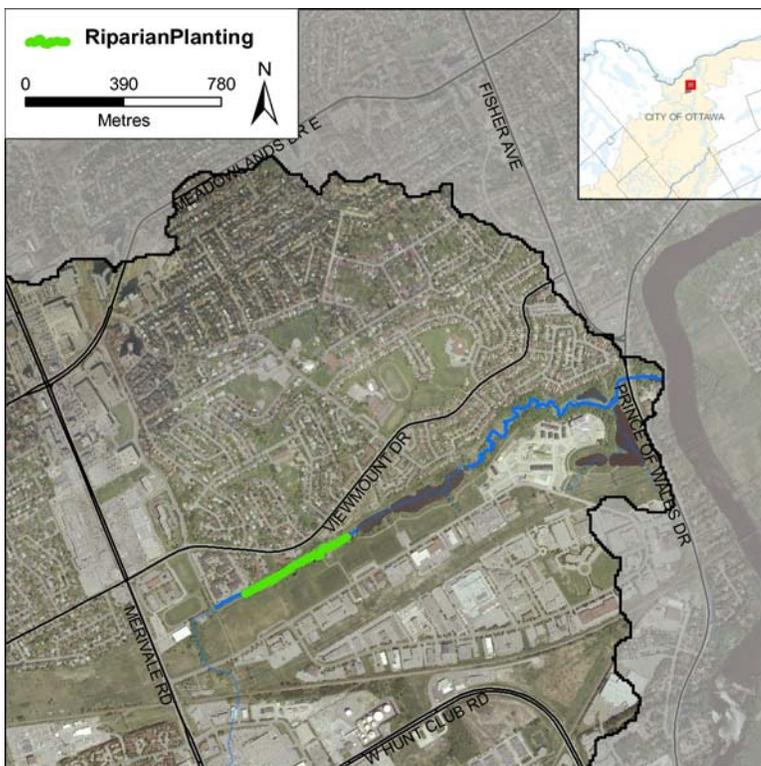


Figure 3. Nepean Creek riparian planting

Nepean Creek Riparian Planting

Approximately 150 volunteers from a number of Scout groups throughout the Ottawa area turned up to help 17 City Stream Watch volunteers and staff plant a section of Nepean Creek this spring. The 17 CSW volunteers spent 51 hours planting 1,500 trees and shrubs along a section of the creek in Nepean Creek Park/Charmaine Hooper Fields.



Planting trees and shrubs at Nepean Creek

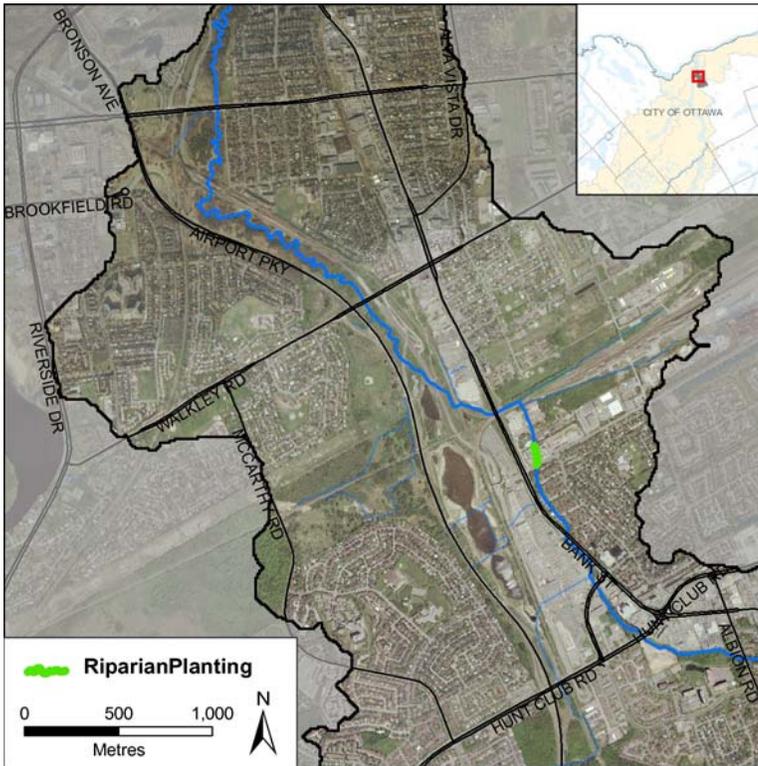


Figure 4. Sawmill Creek riparian planting

Sawmill Creek Riparian Planting

Many volunteers celebrated Earth Day this year by improving shoreline conditions along Sawmill Creek at Ottawa Southbank Dodge Chrysler Jeep. Twenty four volunteers braved a cold start to the day to spend 101 hours planting 450 native trees and shrubs along the creek.



Volunteers planting trees and shrubs along Sawmill Creek

Stevens Creek Riparian Planting

A group of nine City Stream Watch volunteers came together this spring to plant approximately 900 native trees and shrubs at a private residence along Stevens Creek. The volunteers spent 34 hours planting a combination of bare root stock and potted stock at the site.

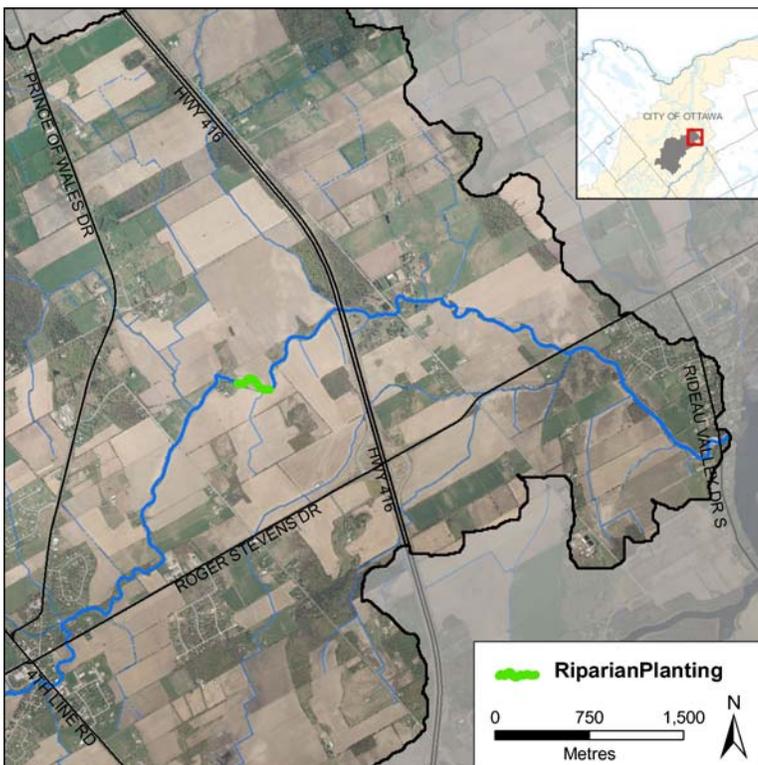


Figure 5. Stevens Creek riparian planting



Volunteers at the Stevens Creek riparian planting

Bioengineering/Restoration Projects

Bioengineering is an erosion control method that combines engineering with ecological function designed to mimic what nature already does. It is an old science that uses plant species with specific growth habits (willows, dogwoods) to create structures that form large root masses which stabilize soil and provide riparian habitat. The benefits of improving the riparian area are numerous and include improved aesthetics, better habitat for both instream and riparian areas (nesting, shelter, food), and improved water quality (filtration and uptake of contaminants and nutrients). In terms of structural benefits, bioengineering can be used on steep slopes and sensitive areas with limited access or in areas where machinery cannot be brought in.



Before



After

Graham Creek Restoration Project - Phase One

In 2012, City Stream Watch worked with RVCA's Shoreline Naturalization Program in partnership with the City of Ottawa to carry out the first phase of the Graham Creek Shoreline Restoration Project. The project's goal was to rehabilitate eroded sections of shoreline on both sides of Graham Creek in Andrew Haydon Park. The sites had been previously identified for restoration through City Stream Watch monitoring activities.

Phase one of the project was to restore the west bank of the creek using a combination of riparian planting and a modified bioengineering technique. The steeply eroded slope was re-graded and soils were wrapped in two types of erosion control fabric, coir material to provide structure and coconut matting to hold the finer sediments in. Native shrubs were planted in to the newly wrapped soil and the top of slope was planted with a mix of native trees and shrubs. As the planted material becomes established and other vegetation moves in to the area dense root systems will hold the soil together, which is the key to stabilizing the shoreline. In addition, a native wildflower garden was planted for park visitors to enjoy. Seventeen volunteers contributed 73 hours of hard work to this project over the course of two days. RVCA staff will continue to monitor the site, and the second phase of the project is scheduled to take place in 2013.



Planting the wildflower garden



Installing erosion control fabric



Planting native trees and shrubs

Invasive Species Removal

Invasive species are of concern because they:

- Have major implications for stream habitat
- Can outcompete native species, negatively effecting local wildlife, fish and plants
- Are one of the largest threats to ecosystems throughout Ontario
- Are costly to manage: it is estimated that spending on 16 invasive species amounts to between \$13.3 and \$34.5 billion (Government of Canada, 2004)
- Over 180 non-native species have been found in the Great Lakes area, with a new aquatic species arriving in the Great Lakes on average of every six to nine months (Government of Canada, 1999)

Invasive species originate from other countries and are introduced through:

- Global shipping containers
- Ship ballast water
- Pet trades
- Aquarium and horticultural activities
- Live bait industry
- Seeds, parts of plants and larvae can get caught on boats, boat trailers, fishing equipment, etc. (OMNR, 2008)



Yellow Iris

Since 2010, City Stream Watch has been focusing efforts on removing Yellow iris from the mouth of three creeks in the City Of Ottawa. The removal methods for invasive species were taken from the Ontario Federation of Anglers and Hunters (OFAH) website and local community members that have been involved in various types of removals. Yellow Iris was first observed along the shoreline of Greens Creek during City Stream Watch monitoring in 2010. It was also observed at the mouth of Graham Creek and Stillwater Creek. Removals were completed in 2010 at the mouth of all three creeks. In 2011, City Stream Watch staff re-visited the sites to monitor success, and any remaining clumps of yellow iris were flagged and removed later in the season. In 2012, monitoring by City Stream Watch staff showed that removal efforts from the past two seasons were having a positive effect, but that it was still important to return annually to remove any remaining clumps. There was a noticeable reduction in the amount of Yellow Iris present at the mouth of all three creeks, and any plants that were found during monitoring activities were flagged and removed by volunteers at events later in the season.



Volunteers at the 2011 Greens Creek yellow iris removal event



Volunteers at the 2012 Graham Creek Yellow Iris removal event

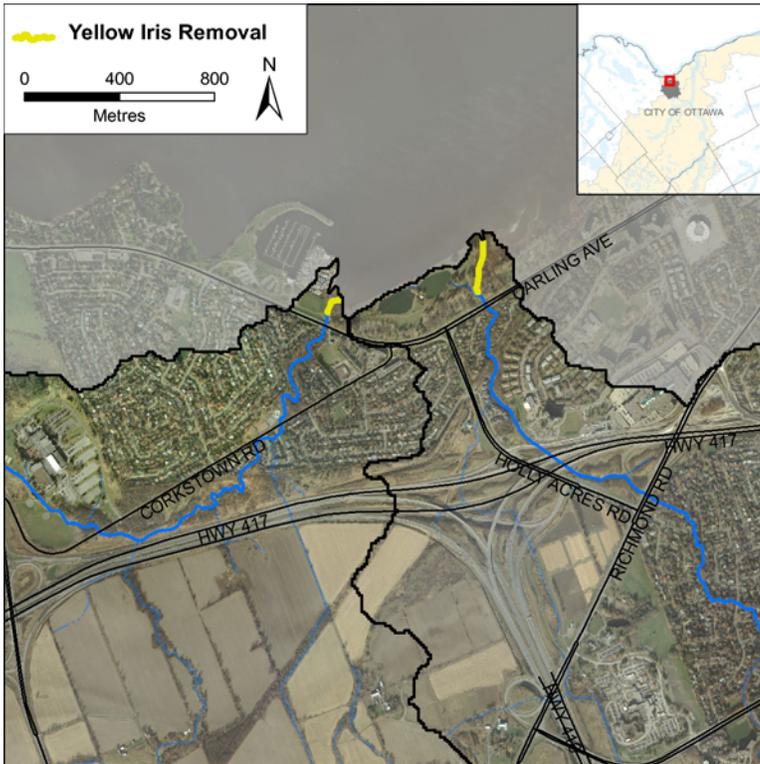


Figure 6. Yellow Iris removal on Stillwater and Graham Creek

Graham Creek & Stillwater Creek Invasive Species Removal

In June 2012, City Stream Watch staff and volunteers met at Andrew Haydon Park to remove Yellow Iris from the mouth of Graham Creek and Stillwater Creek. Sixteen volunteers spent 64 hours digging plants up by hand and collecting them in compostable bags. The bags were brought to a City facility for appropriate disposal.



Above and Below: Volunteers and CSW staff removing Yellow Iris from the mouth of Graham Creek and Stillwater Creek

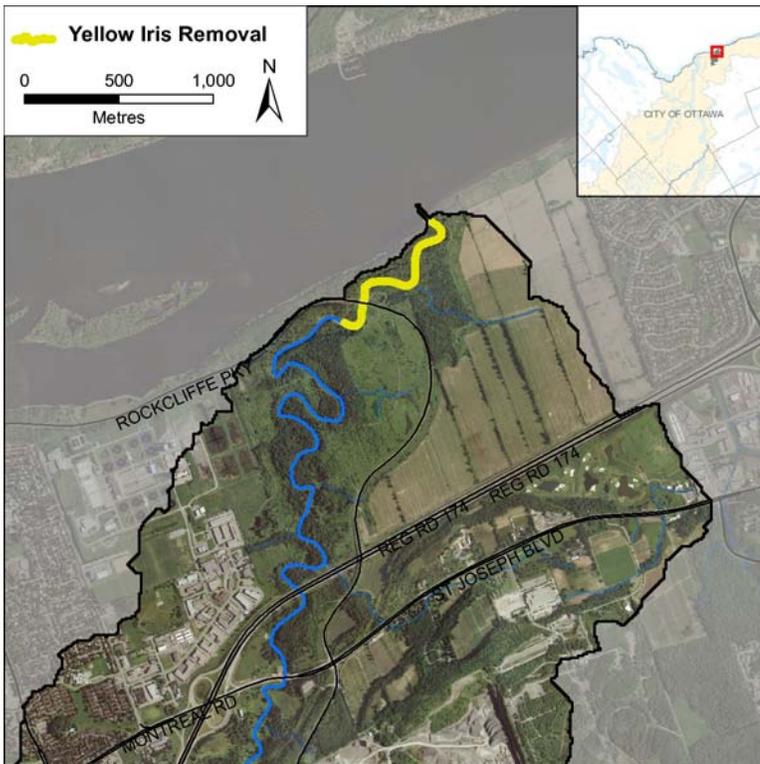


Figure 7. Yellow Iris removal on Greens Creek



Greens Creek Invasive Species Removal

One month after the invasive species removal in Andrew Haydon Park, City Stream Watch staff and volunteers spent a day removing yellow iris from the mouth of Green's Creek. The removal took place from the mouth of the creek to just past the Rockcliffe Parkway. In total, six volunteers spent 19 hours removing this invasive species from Greens Creek.

Stream Garbage Cleanups

City Stream Watch volunteers participated in an outstanding 6 stream garbage cleanups in 2012. In total, approximately 3.5 kilometres of shoreline and stream were cleaned on Sawmill Creek, Greens Creek, Taylor Creek, and Graham Creek. Sawmill Creek and Greens Creek both received special attention this year as two cleanups were held on each of these creeks.

The Great Canadian Shoreline Cleanup And Earth Day Cleanup on Sawmill Creek

City Stream Watch volunteers and staff celebrated Earth Day in April by cleaning targeted sections of Sawmill Creek. In September, volunteers returned to the same sites for another cleanup as part of The Great Canadian Shoreline Cleanup. Over the course of both events, 41 volunteers contributed 148 hours towards removing garbage of human origin from Sawmill Creek.

The Great Canadian Shoreline Cleanup happens each year across Canada. It started 18 years ago as a conservation initiative of the Vancouver Aquarium and it has grown into the second largest cleanup in the world. City Stream Watch participates in this event every year, helping to contribute to this national cleanup effort. In addition to the cleanup on Sawmill Creek, the staff at SNC Lavelin contacted CSW staff about locations in need of cleanup and as a result they targeted the mouth of Graham Creek for their cleanup efforts.

Rideau River Cleanup

The City Stream Watch Program joined forces with the Urban Rideau Conservationists (URC) to help clean the Rideau River as part of their annual “Mother’s Day Cleanup” held in May. City Stream Watch takes part in this initiative each year and provides canoes and staff to help with the cleanup efforts.

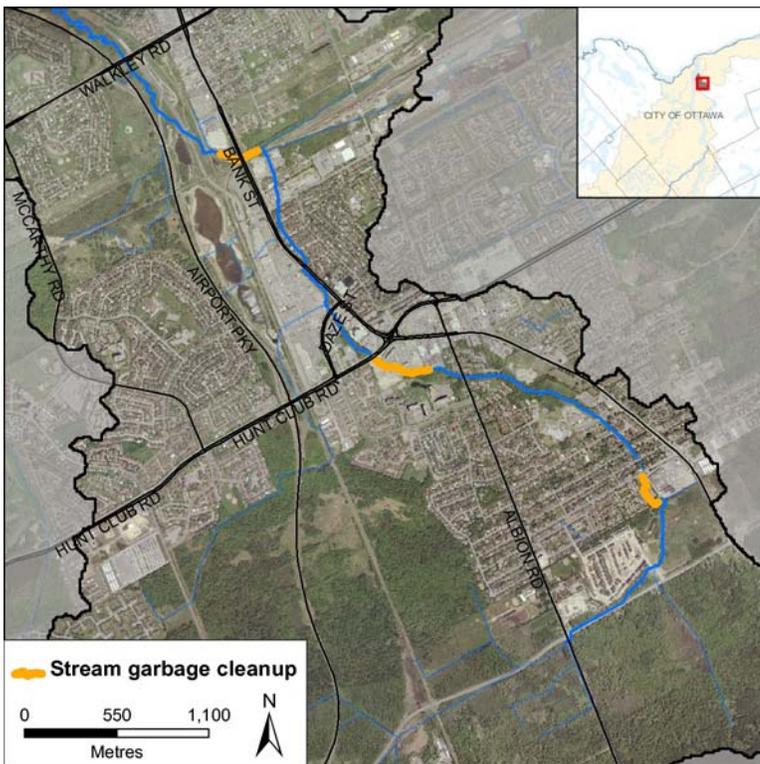


Figure 8. Stream garbage cleanup on Sawmill Creek



The Great Canadian Shoreline Cleanup on Sawmill Creek

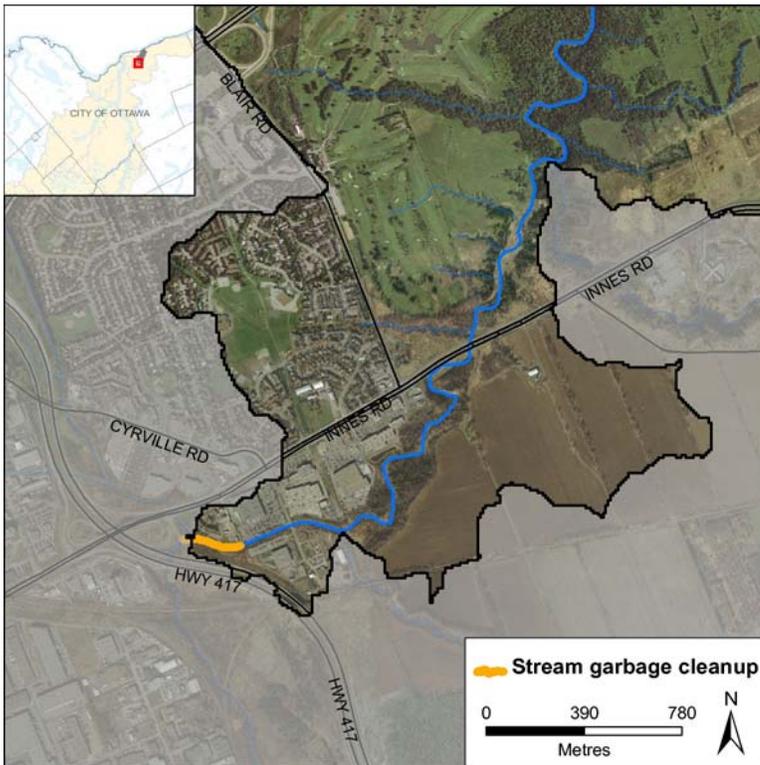


Figure 9. Stream garbage cleanup on Greens Creek

Greens Creek Stream Garbage Cleanup

This season City Stream Watch had the opportunity to partner with the Travelodge Hotel and the Ottawa Flyfishers Society to cleanup a site along Greens Creek near highway 417. After an initial inspection and cleanup of the site by CSW staff and a volunteer, the Ottawa Flyfishers Society lead a second cleanup event to ensure that the site was free of waste before the winter. In total, 15 volunteers from the City Stream Watch Program, the Ottawa Flyfishers Society, and the Travelodge Hotel spent 30 hours cleaning the site. City Stream Watch will continue to work with the Travelodge Hotel to help remediate this site.



Taylor Creek Stream Cleanup

In 2007 City Stream Watch held a cleanup event at Princess Louise Falls on Taylor Creek near St. Joseph Blvd. This year City Stream Watch returned to clean up this unique site again. In late July volunteers and CSW staff cleaned from St. Joseph Boulevard to the falls. This section of the stream becomes heavily polluted as debris of human origin accumulates at the base of the falls. Ten volunteers turned out and put in 28 hours of work to help ensure that Princess Louise Falls remains healthy and beautiful for everyone to enjoy.

Above: Volunteers at the Greens Creek cleanup

Below: A volunteer pulling debris out of Taylor Creek



Figure 10. Stream garbage cleanup on Taylor Creek



Workshops and Demonstrations

City Stream Watch held three workshop/demonstration events in 2012. Events included the annual Ultimate Aquatic Workshop and two fish and benthic invertebrate sampling 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. Sixty-eight volunteers dedicated 264 hours to these events in 2012.

The Ultimate Aquatic Workshop

On September 29th 2012, City Stream Watch teamed up with the Ottawa Flyfishers Society (OFS) for the fifth season in a row to put on a day of benthic invertebrate identification and fly fishing lessons at the Jock River Landing. 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 flyfishing, conservation and resource renewal.

Thirty-two volunteers, including OFS members, dedicated 165 hours to the Ultimate Aquatic Workshop. The workshop included the following contributions from RVCA staff and OFS members:

Rideau Valley Conservation Authority staff:

- The basics of the OBBN protocol (Ontario Benthos Biomonitoring Network), how to survey, process and identify the 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 fly fishing
- Gave an introduction to fly fishing and provided samples of fly ties
- Paired up with volunteers to assist them with casting and develop their techniques.

Benthic Invertebrate and Fish Sampling Demonstrations

Two benthic invertebrate and fish sampling demonstrations were held in 2012. One of the sessions was held for CSW volunteers at the Jock River landing and the other was held on Graham Creek for residents of Accora Village. Thirty five volunteers attended the two sessions for a total of 99 hours.

The activities that volunteers participated in included:

- Picking up nets (large fyke net, small fyke net, windemere trap) from a 24 hour set
- Learning about aquatic invasive species
- Learning about key identification features of captured fish
- Learning about identification features of benthic invertebrates to order level
- Sampling for benthic invertebrates with nets
- Sorting the benthos and keying them out



Volunteers identifying Benthos



Volunteers trying out casting



RVCA staff demonstrating benthic invertebrate sampling techniques

Plans for 2013

In 2013, City Stream Watch will be sampling on the following creeks:

- Borthwick Creek
- Cranberry Creek
- Hunt Club Creek
- Ramsay Creek
- West Bilberry 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

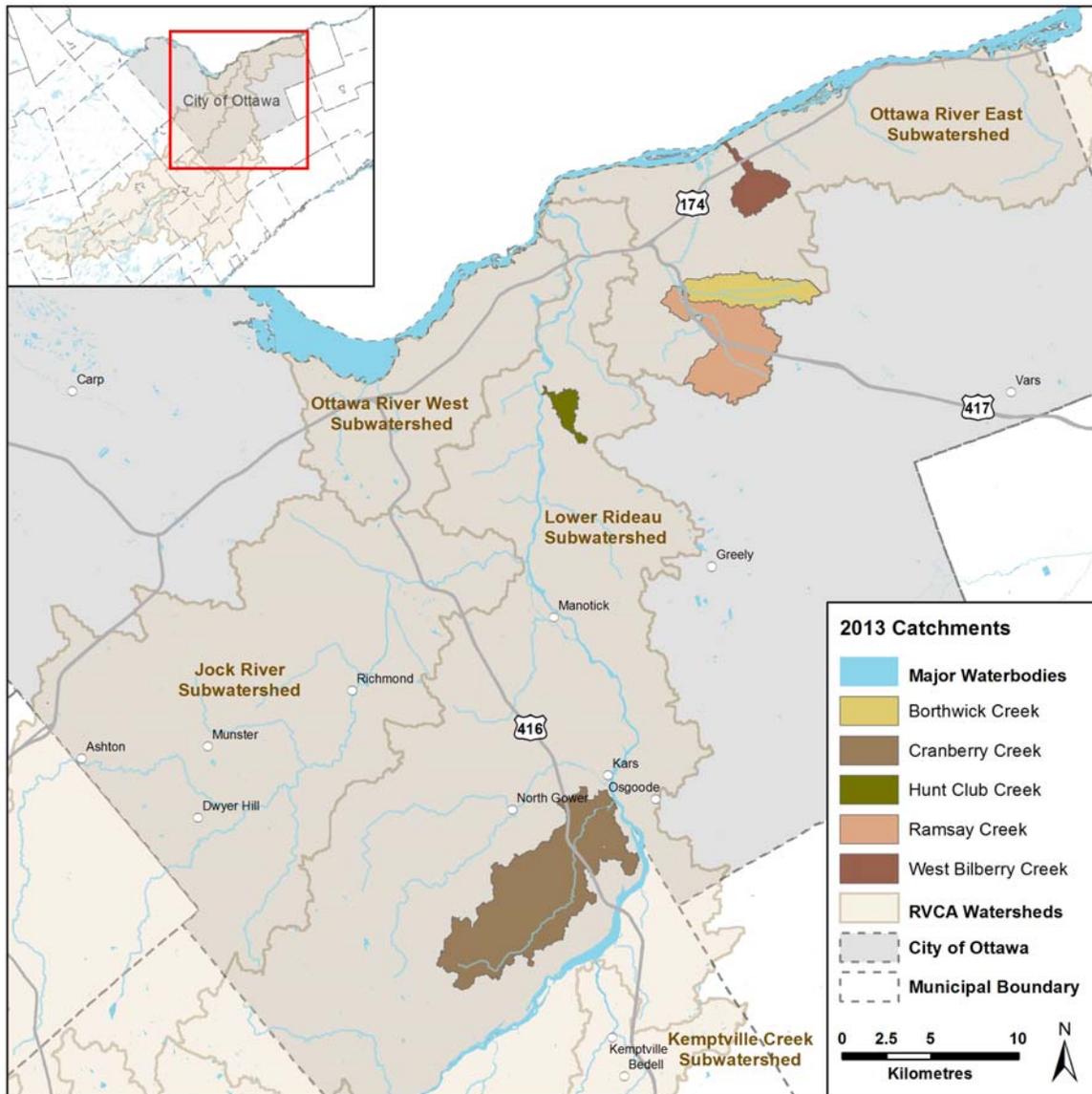


Figure 11. Location of 2013 monitoring activities

To volunteer with City Stream Watch projects, please contact:
 City Stream Watch Coordinator
 613-692-3571
citystreamwatch@rvca.ca
<http://www.rvca.ca/programs/streamwatch/index.html>



Acknowledgements

A big thank you to all of our 2012 volunteers. You continue to make the program successful 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 and volunteer recruitment and help!

Thank you to **Bruce Clarke** and members of the **Ottawa Flyfishers Society** for running the very popular fly fishing demonstration, leading the shoreline cleanup on Greens Creek, and recruiting club members for City Stream Watch projects.

Thank you to **Peter Stewart-Burton** of the **National Defense Headquarters Fish and Game Club** for helping to recruit club members for the Sawmill Creek cleanup and for continuing "Adopt a Stream" at the south end of Sawmill Creek.

Thank you to **Greg** of the **Heron Park Community Association** for continuing "Adopt a Stream" on the north end of Sawmill Creek

Thank you to **Yvon Deslauriers** of the **Ottawa Flyfishers Society** for organizing "Adopt a Stream" on Greens Creek

Thank you to **Rose Embrett** of the **Ottawa East Travelodge Hotel** for partnering with City Stream Watch and recruiting volunteers for the Greens Creek shoreline cleanup.

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

Thank you to the **RVCA's Shoreline Naturalization Program** for organizing the 2012 riparian plantings and Graham Creek Restoration Project