



# City Stream Watch 2011

## Summary Report





# City Stream Watch 2011

- Becketts Creek
- Pinecrest Creek
- Stevens Creek

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**Heron Park**  
Community Association



National  
Defence

Défense  
nationale

Canada

## Thank you to Our 2011 Funding Partners

### Natural Resources Canada, Science and Technology Internship

NRCan supported City Stream Watch by helping to fund a nine month resource technician internship position.

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

A total of \$4,500 was received from the CFWIP for field equipment, refreshments for volunteers and native shrubs and trees planted along Stillwater Creek.



Natural Resources  
Canada

Ressources naturelles  
Canada





# City Stream Watch 2011 Summary Report

## City Stream Watch Organizational Chart

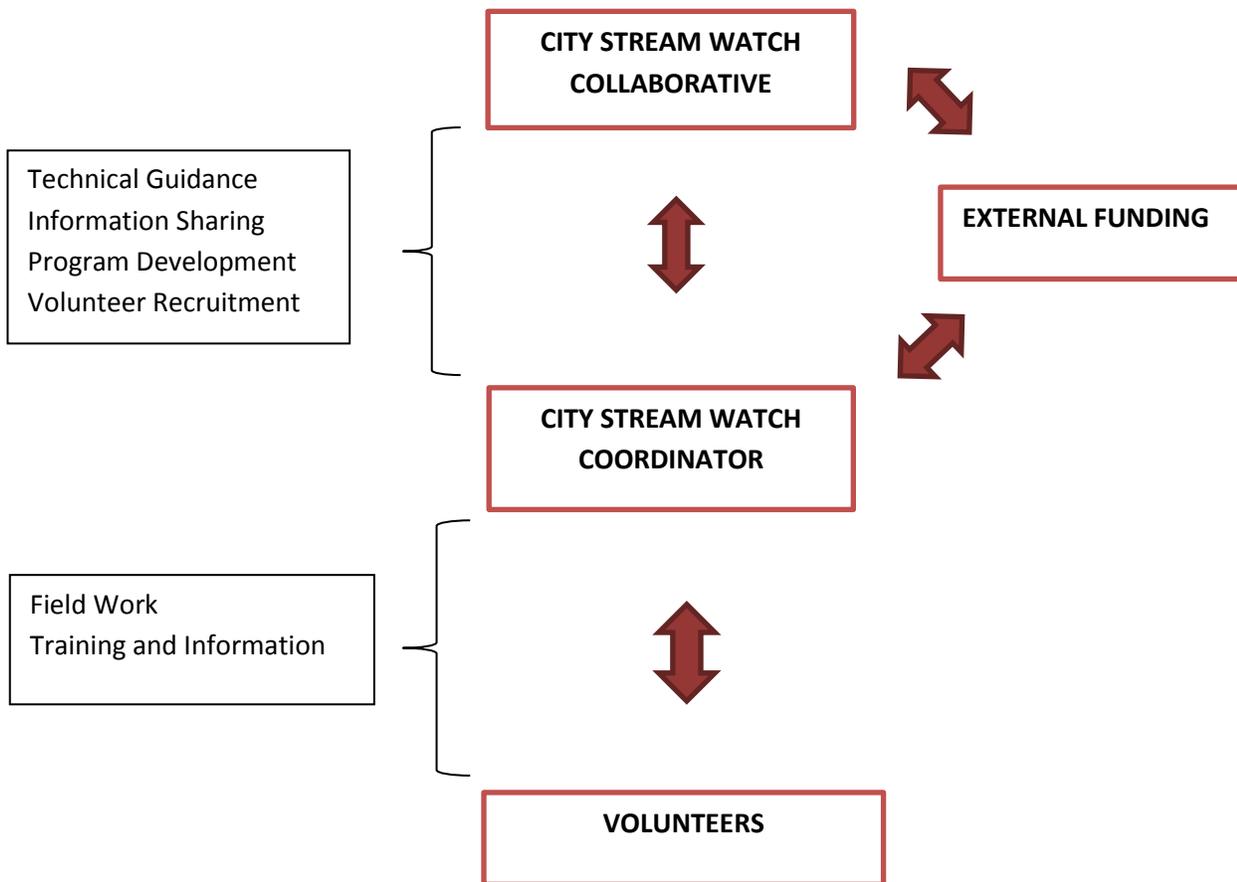


Figure 1. City Stream Watch Organizational Chart



# City Stream Watch 2011 Summary Report

## 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 23 watercourses in the City of Ottawa and each stream is monitored every six years. Volunteers, guided by an experienced coordinator, 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
- 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 opportunities



Volunteer measuring wetted stream width



Volunteers measuring 50 metres upstream

## 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 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. The following methods are used to capture fish:

### 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

- 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
- effective way to sample fish in a variety of habitats



## Thermal Classification Methodology

Temperature is an important parameter in streams as it influences many aspects of physical, chemical and biological health. The temperature of a stream can vary considerably between the seasons and fluctuate between night and day. Many factors can influence fluctuations in stream temperature such as springs, tributaries, precipitation runoff and discharge pipes. The greatest factor of fluctuating temperature is solar radiation and runoff from developed areas. Streams with large amounts of riparian canopy cover will yield lower temperatures while areas with no trees may be warmer. The thermal classifications for cold, cool and warm water are provided in Table 1.

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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City Stream Watch uses the Stoneman and Jones method for temperature classification, which is an accepted method by both Ministry of Natural Resources and Fisheries and Oceans Canada for assigning thermal classification. Classification is based on temperature data for each stream, taken at 4:00 p.m., between July 1 and August 31, on days where maximum air temperature exceeds 24.5°C and after two previous days without precipitation and air temperatures surpassing 24.5°C. Although dataloggers are set to record temperatures between April and October, only the days that meet the temperature requirements are used in classification. Another important methodology of temperature classification is through fish community data. Fish have different temperature requirements, and these are also considered when classifying the stream. For example, if a species is recorded in a stream that requires cold water, there are likely cold water inputs influencing that stream.

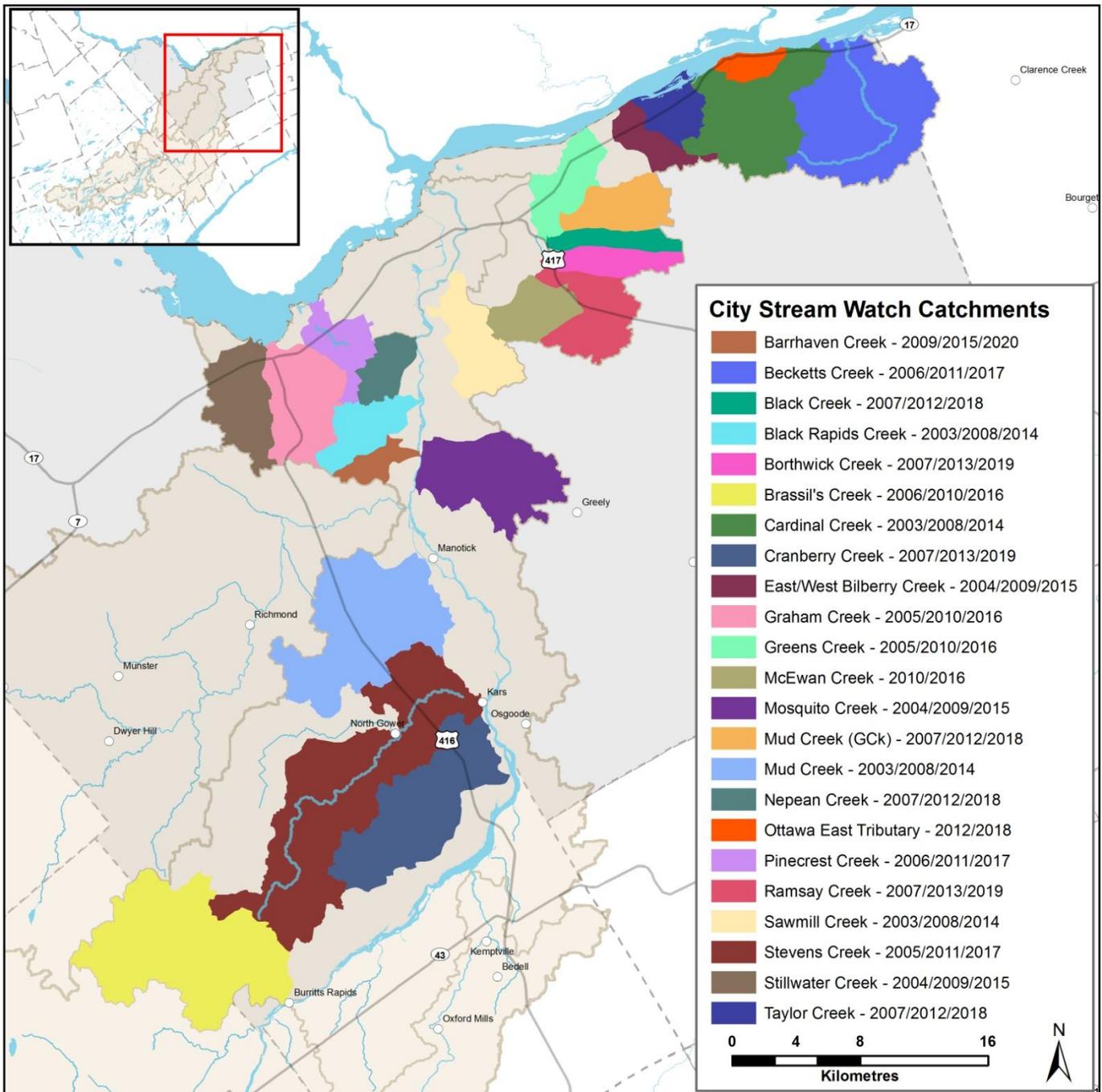


Figure 2. Locations and Schedule of City Stream Watch Monitoring

## 2011 Summary

The *City Stream Watch 2011 Summary Report* highlights accomplishments from the 2011 field season and describes the nature and extent of volunteer projects. To find information collected on the 2011 streams surveyed (Becketts Creek, Pinecrest Creek, Stevens 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 222 volunteers from the community participated in the program throughout the field season, contributing a total of 1,575 hours working on various projects. Approximately 32.4 kilometres of stream were surveyed in 2011.

## Stream Study/Comparison

The following chart is a comparison summary of activities done on each creek in 2005, 2006 and 2011. Volunteer numbers and hours continue to increase as the program has incorporated more activities and gained greater recognition within the community. In 2005, there were 110 volunteers and over five years, that number has grown to over 200. Overall, each stream experienced changes within the stream cycle. Anthropogenic alterations increased on Stevens and Becketts. The amount of garbage increased on Steven's and Pinecrest. Erosion on Pinecrest Creek improved, likely resulting from recent rehabilitation work done by the NCC, although instream vegetation has not diversified since 2006. The most notable change was an increase in number and types of invasive species on each creek. Since 2005, as new invasive species have been introduced, there has been an increased focus and knowledge on identification. 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	Becketts Creek 2006	Becketts Creek 2011	Pinecrest Creek 2006	Pinecrest Creek 2010	Stevens Creek 2005	Stevens Creek 2011
Number of sections surveyed	116	158	26	26	144	140
Number of volunteers	N/A	35	N/A	26	N/A	48
Total volunteer hours	101	288.5	115	102.5	N/A	377.5
Number of fish sampling sites	0	11	1	7	2	14
Number of temperature probes	2	5	3	3	2	5

Table 2. Stream study comparison between 2005, 2006 and 2011



Top photo: Pinecrest Creek, 2006

Bottom photo: Pinecrest Creek, 2011



## 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:

- 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 spawning and nursery habitat 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



# City Stream Watch 2011 Summary Report

## The Community Response

A total of 222 volunteers spent 1,575 hours with the City Stream Watch program in 2011. The volunteers are the backbone of the program. Many volunteers participated in surveys and events on more than one creek; therefore the number is listed as not available (N/A). The 222 volunteers do not include all school and scout groups.

	Beckett's	Pinecrest	Steven's	Green's	Sawmill	Stillwater	Bilberry	Graham	Black Rapids	Rideau	Jock	Total
Sections surveyed	158	26	140	--	--	--	--	--	--	--	--	324
Fishing events	4	1	2	--	--	--	--	--	--	--	3	10
Fish sites	11	7	14	--	--	--	--	--	--	--	--	32*
Fish Sites Sampled from April to July	23	13	24	--	--	--	--	--	--	--	--	60
Training sessions	0	0	1	0	1	--	--	--	--	--	--	2
Number of cleanups	0	1	0	0	1	--	0	1	0	1	--	4
Kilometres (km) Cleaned	0	2	0	--	2.5	--	--	1	--	2	--	7.5
Shrub and tree plantings	0	0	0	0	0	2	2	--	1	--	--	5
Invasive species removal	0	0	0	1	0	1	0	1	0	--	--	3
Adopt a Stream	--	--	--	yes	yes	--	--	--	--	--	--	2
Number of Volunteers (total for all events)	36	26	48	8	30	49	45	10	24	2	58	N/A
Volunteer Hours	288.5	102.5	377.5	28	88	177.5	115	25	91.5	8	273.5	1575**

Table 3. City Stream Watch Accomplishments, 2011

\*Some fish sites are sampled more than once between April and July

-- Not in monitoring cycle for 2011; only special events were held on these creeks



Left photo: Becketts Creek, centre photo: Stevens Creek, right photo: Pinecrest Creek

## Volunteer Projects

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

- Planting 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 2011. Over the summer, City Stream Watch ran 13 special events outside of regular sampling.

### Riparian Planting

- 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](http://www.rvca.ca/programs/RVCA_Shoreline_naturalization.pdf)

Five shoreline planting projects took place in 2011. Each shoreline planting was done in partnership with the Rideau Valley Conservation Authority’s “Making Shorelines Natural” Project. Using monitoring data from City Stream Watch program and City of Ottawa, several tributaries within the urban area were chosen as priority sites for shoreline plantings.

Working closely with private landowners, businesses and agencies, shorelines along Stillwater Creek, Black Rapids Creek, Mud Creek and Bilberry Creek were naturalized with help from community groups and volunteers. Overall, 113 City Stream Watch volunteers spent 384 hours planting native shrubs and trees to improve the shorelines along these systems.



Volunteers planting at Nepean Equestrian Park, Stillwater Creek



Black Rapids Creek, post-planting

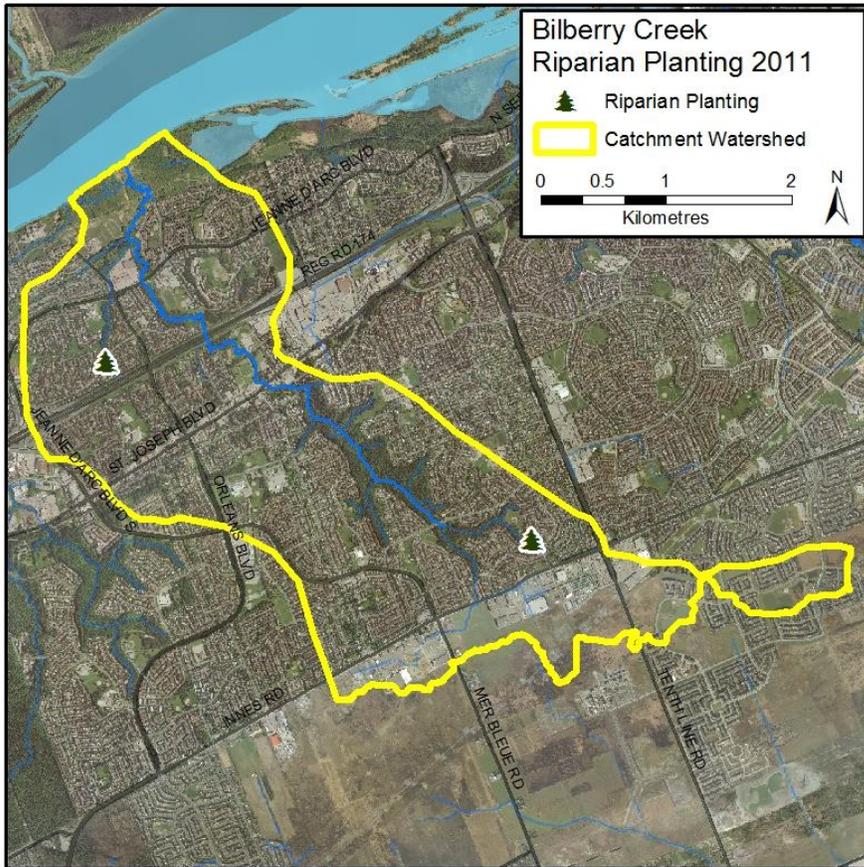


Figure 3. Locations of Riparian Plantings on Bilberry Creek

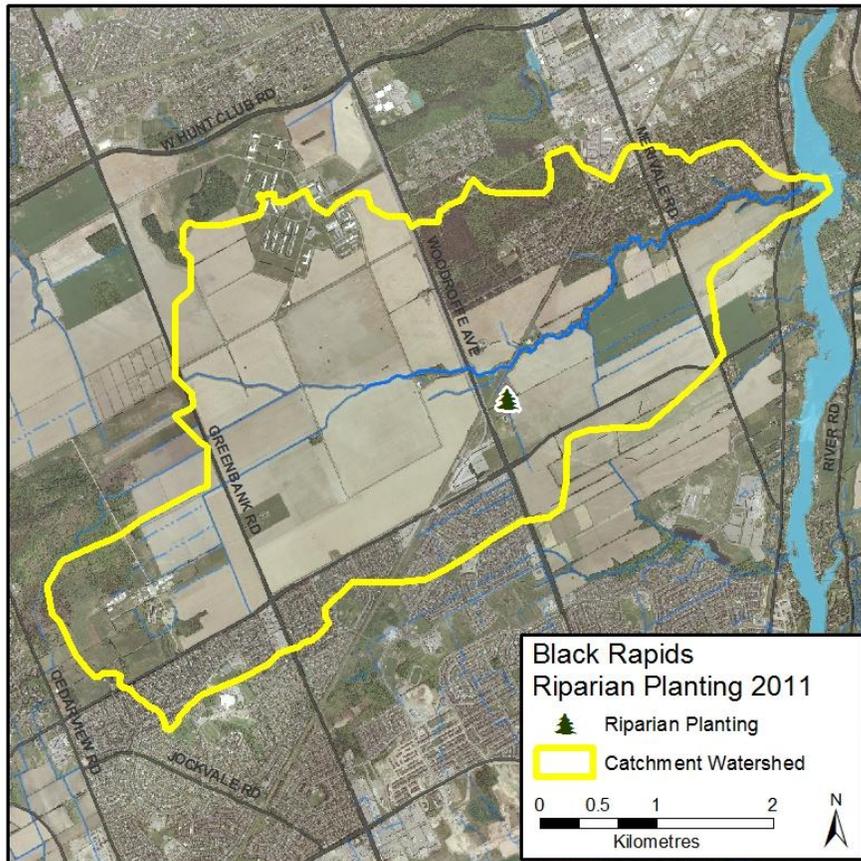


Figure 4. Location of Riparian Planting on Black Rapids Creek

Two sites along Bilberry Creek were planted, and they were both carried out in the fall, with potted stock. One site was located in the headwaters. Students from St. Peter High School and St. Matthew High School planted 350 shrubs and trees at Yves Rocher Park in Orleans.

Four hundred native shrubs and trees were planted at Terry Fox Park by City Stream Watch volunteers. The plant took place on either side of Fortune Drive. Over Saturday and Sunday, 61 volunteers spent a total of 122.5 hours planting, watering and carrying soil.



Twenty-two volunteers spent 88 hours planting 560 native shrubs and trees on a tributary to Black Rapids Creek.

All sites will be monitored for survival.



Top photo: Volunteers planting along Bilberry Creek  
Bottom photo: Volunteers planting along Black Rapids Creek

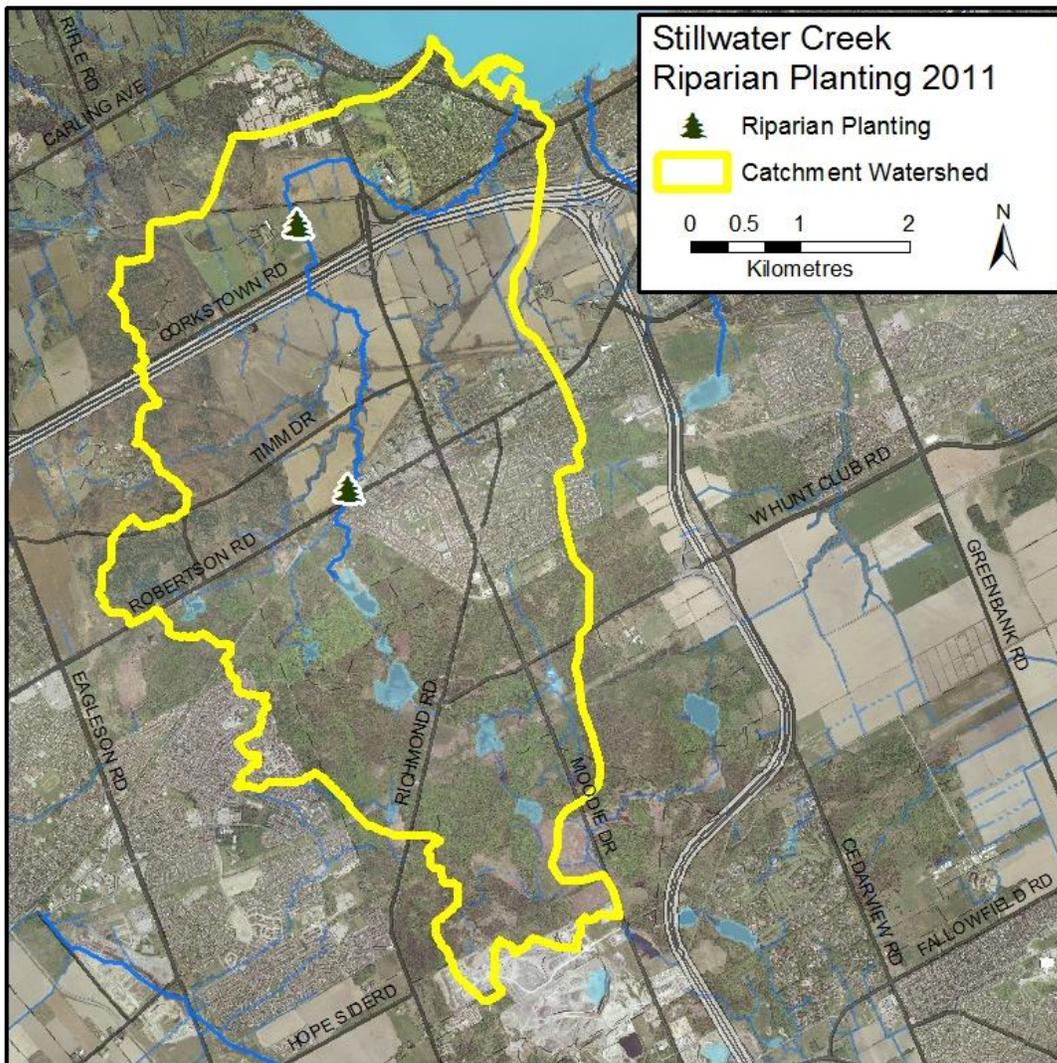


Figure 5. Locations of Riparian Plantings on Stillwater Creek

Two sites along Stillwater Creek were planted in the spring of 2012. The first site to be planted was the Nepean Equestrian Park. Thirty-two volunteers spent a total of 128 hours planting native shrubs and trees to improve shoreline conditions. In addition, Sacred Heart High School, All Saints Catholic High School and St. Francis Xavier High School took part in planting at the Equestrian Park on different occasions. A total of 55 students and teachers spent 165 hours towards this rehabilitation project. Overall, approximately 1,500 native shrubs and trees were planted by volunteers.

The second planting site along Stillwater Creek was at the Robertson Road crossing. Twelve volunteers spent 36 hours in the pouring rain, planting 300 native shrubs and trees along the shoreline.

## Invasive Species

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)



Photo of high school students planting shrubs and trees along Stillwater Creek

## How are invasive species spread?

Invasive species originate from other countries and are introduced through:

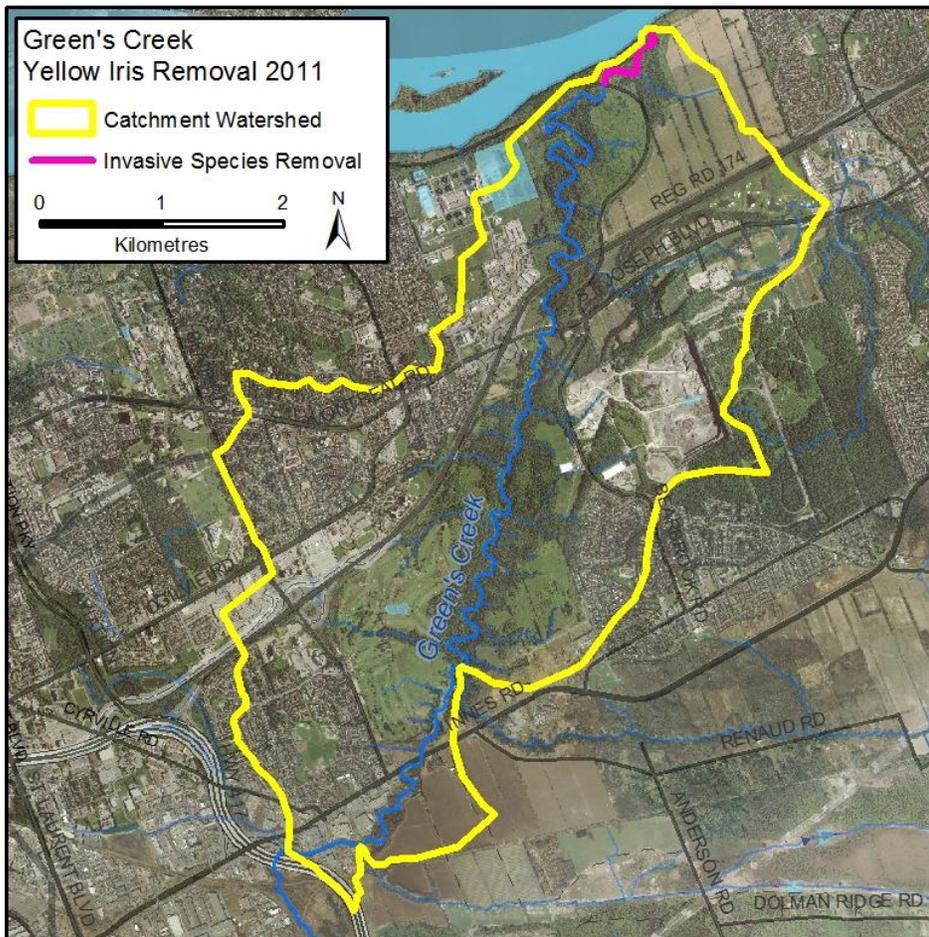
- Global shipping containers
- Ship ballast water
- Pet trades
- Aquarium and horticultural activities
- Live bait industry
- Seeds, parts of plants and larvae can get caught on boats, boat trailers, fishing equipment, etc. (OMNR, 2008)

## Invasive Species Removal

Yellow iris is an invasive species and was observed along the shoreline of Green's 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. 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. In 2011, City Stream Watch staff re-visited the sites to monitor success, and any remaining clumps of yellow iris were flagged.



**Volunteers after yellow iris removal**



**Figure 6. Location of Yellow Iris and Flowering Rush Removal on Green's Creek**

In July 2011, City Stream Watch staff and volunteers participated in removals at the mouth of Green's Creek, Graham Creek and Stillwater Creek. Fourteen volunteers spent 45.5 hours removing invasive species. In 2012, the sites will be monitored for success. The yellow iris and flowering rush were dug by hand and put into compostable bags to be composted as part of the City of Ottawa's green bin program. We have been told that the temperatures at the new composting facility are hot enough to kill the seeds.

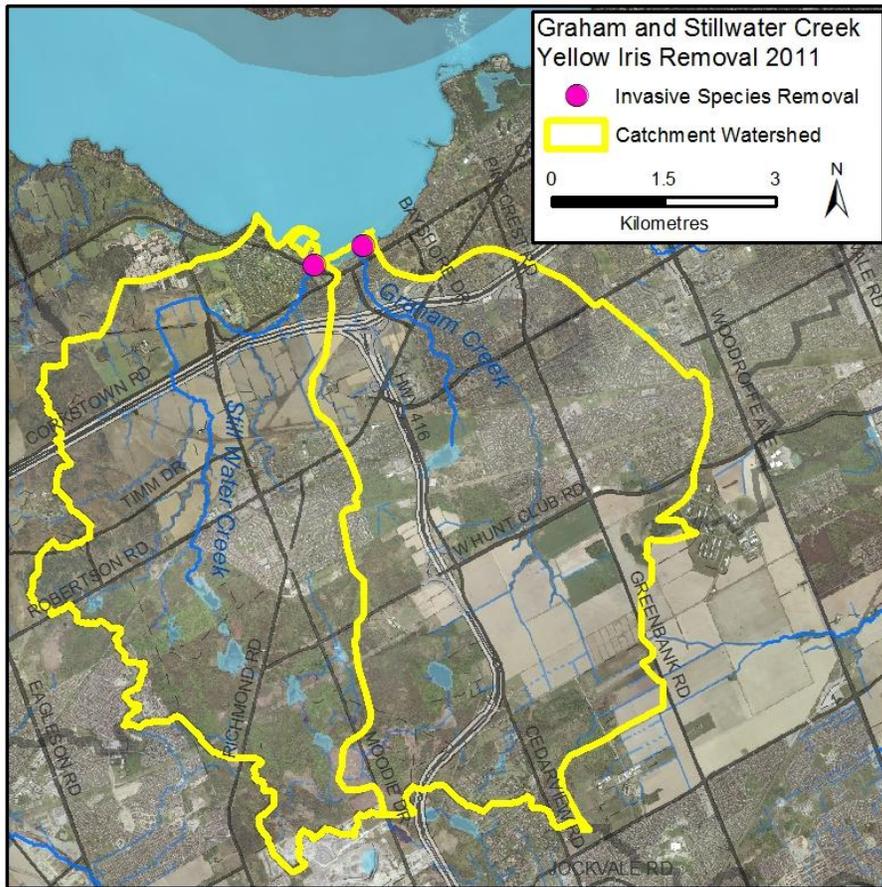
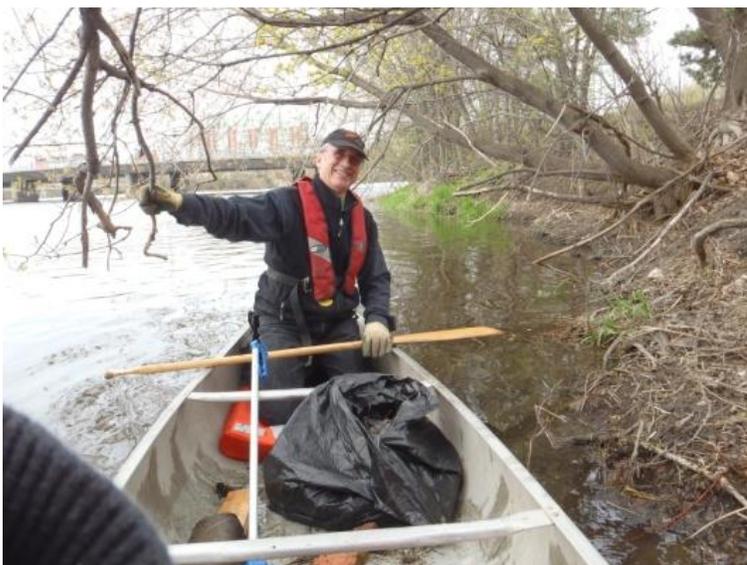


Figure 7. Locations of Yellow Iris Removal on Graham and Stillwater Creek

## Stream Garbage Cleanups

The total area of shoreline and stream cleaned up by City Stream Watch volunteers in 2011 was approximately 7.9 kilometres.

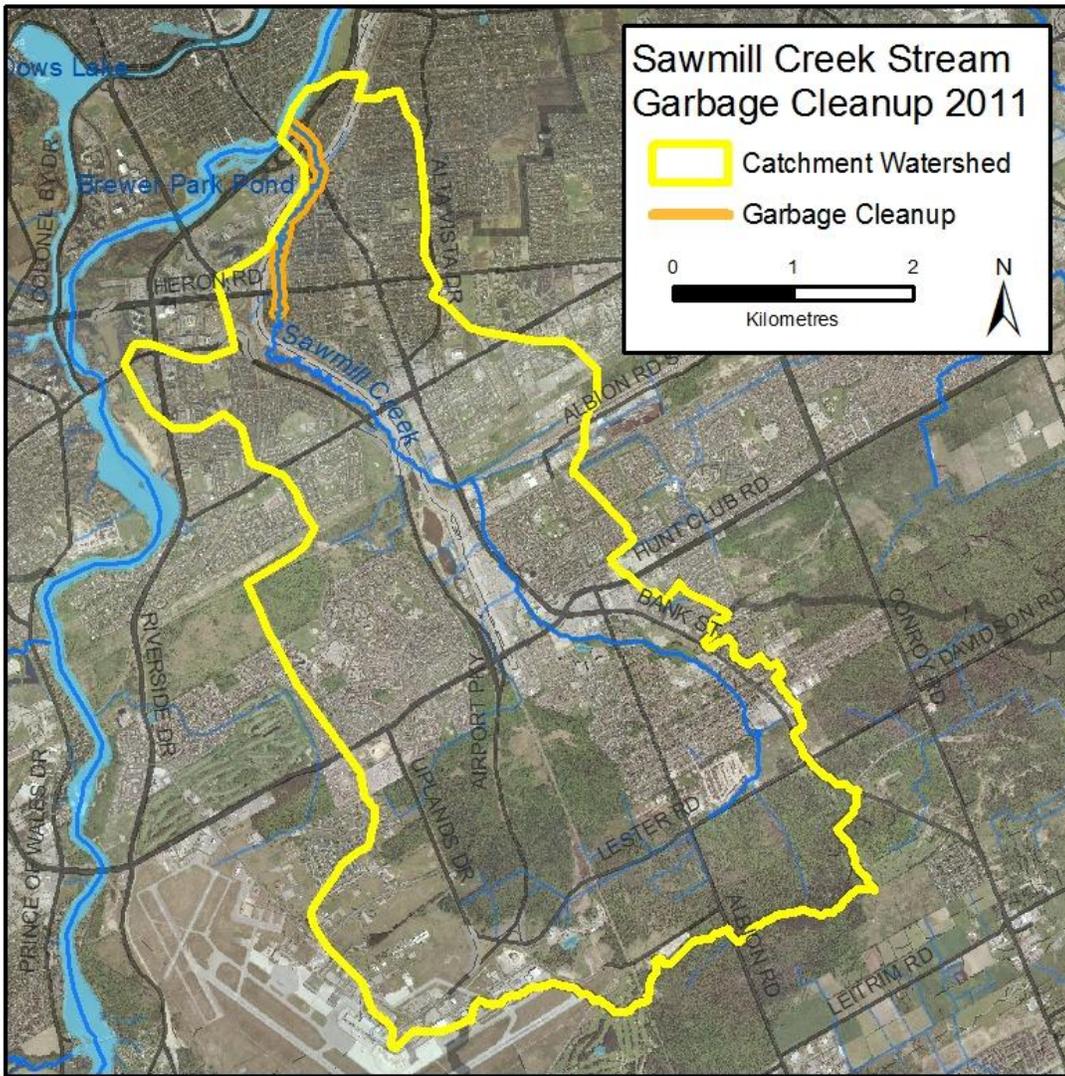


Volunteer at Rideau River Cleanup

## **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 access shoreline areas that would normally be inaccessible by foot and also helps with recruiting volunteers.

## Canadian Rivers Day Cleanup



Canadian Rivers Day occurs on June 14. Each year, City Stream Watch helps celebrate this day by organizing a stream garbage cleanup. In 2011, the cleanup was held on Sawmill Creek, where 10 volunteers spent a total of 38 hours removing garbage of human origin from the shorelines and in the stream.

Figure 8. Location of Sawmill Creek Cleanup



Photos of Canadian Rivers Day Cleanup

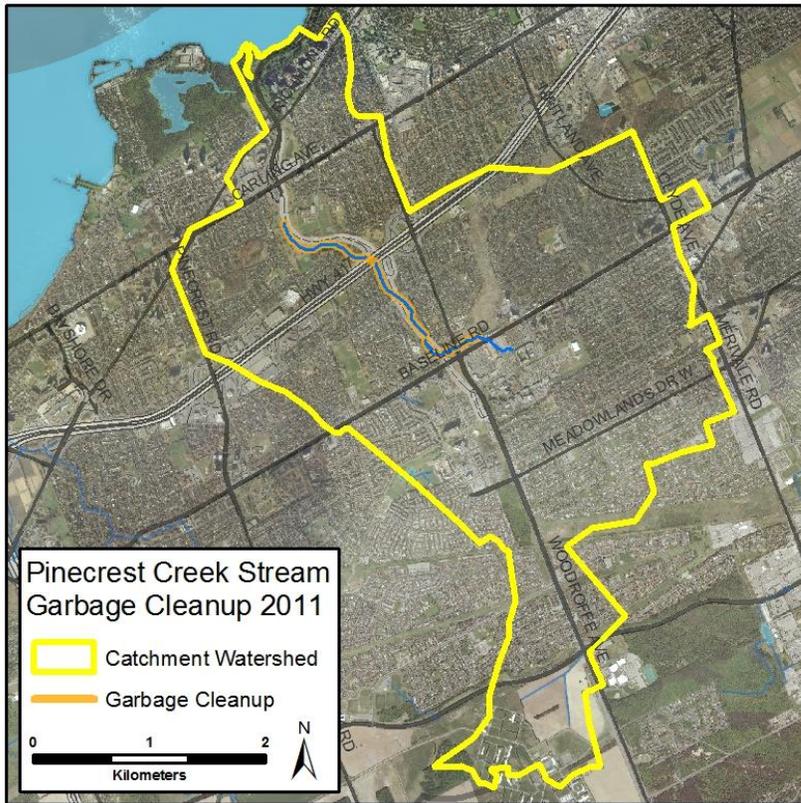


Figure 9. Location of Pinecrest Creek Cleanup by City Stream Watch and SNC Lavelin

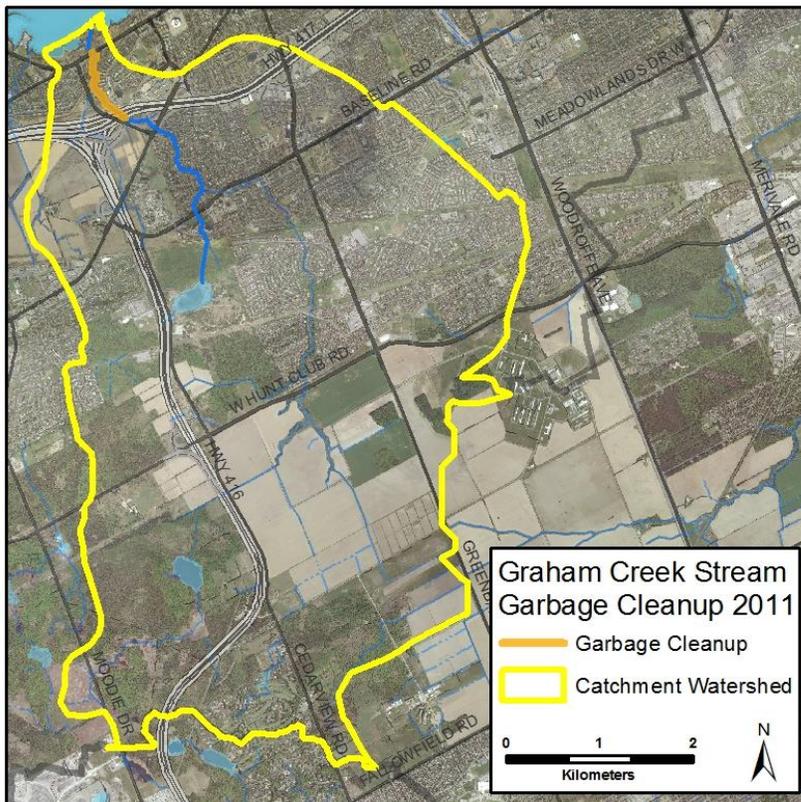


Figure 10. Location of Graham Creek Garbage Cleanup

## The Great Canadian Shoreline Cleanup

The Great Canadian Shoreline Cleanup happens each year across Canada in September. 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.

For 2011, two garbage cleanups were held on streams identified through past City Stream Watch monitoring. The first cleanup was held on Pinecrest Creek, where nine volunteers worked from Iris Street to Baseline Road, for a total of 32.5 hours. The staff at SNC Lavelin contacted CSW staff about locations in need of cleanup and they targeted from Iris Street to Carling Avenue. Because of this coordination, volunteers were able to clean up all of Pinecrest Creek, aside from a separate section at the mouth, for a total of approximately 2.2 kilometres.



Photos: volunteers picking up garbage along Pinecrest Creek



The third cleanup was held at Graham Creek. Three volunteers spent 11 hours cleaning up the stream between Carling Avenue and Highway 417, where the largest concentration of garbage was.

## The Ultimate Aquatic Workshop

On September 17, 2011, City Stream Watch teamed up with a member of the City Stream Watch collaborative, the Ottawa Flyfishers Society (OFS), 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 volunteers, including the OFS members, dedicated 145.5 hours to the Ultimate Aquatic Workshop.

Rideau Valley Conservation Authority staff:

- Staff from the RVCA taught 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 2011. Due to site logistics on the 2011 streams, the sessions were held at the Jock River landing over one weekend. Twenty-eight volunteers attended the two sessions for a total of 128 hours.

The activities that volunteers participated in included:

- Picking up nets (large fyke net, small fyke net, windemere trap ) from a 24 hour set
- Watching RVCA staff demonstrate the backpack electrofisher
- Learning about key identification features of fish captured in nets and from electrofishing
- Learning about identification features of benthic invertebrates to order level
- Sampling for benthic invertebrates with nets
- Sorting the benthos and keying them out.



Volunteers trying out casting



OFS member demonstrating casting



Volunteer sampling for benthic invertebrates



Volunteers sorting benthic invertebrates

## Plans for 2012

In 2012, City Stream Watch will be sampling the following creeks:

- Mud Creek
- Black Creek
- Taylor Creek
- Nepean Creek
- Ottawa East Tributary

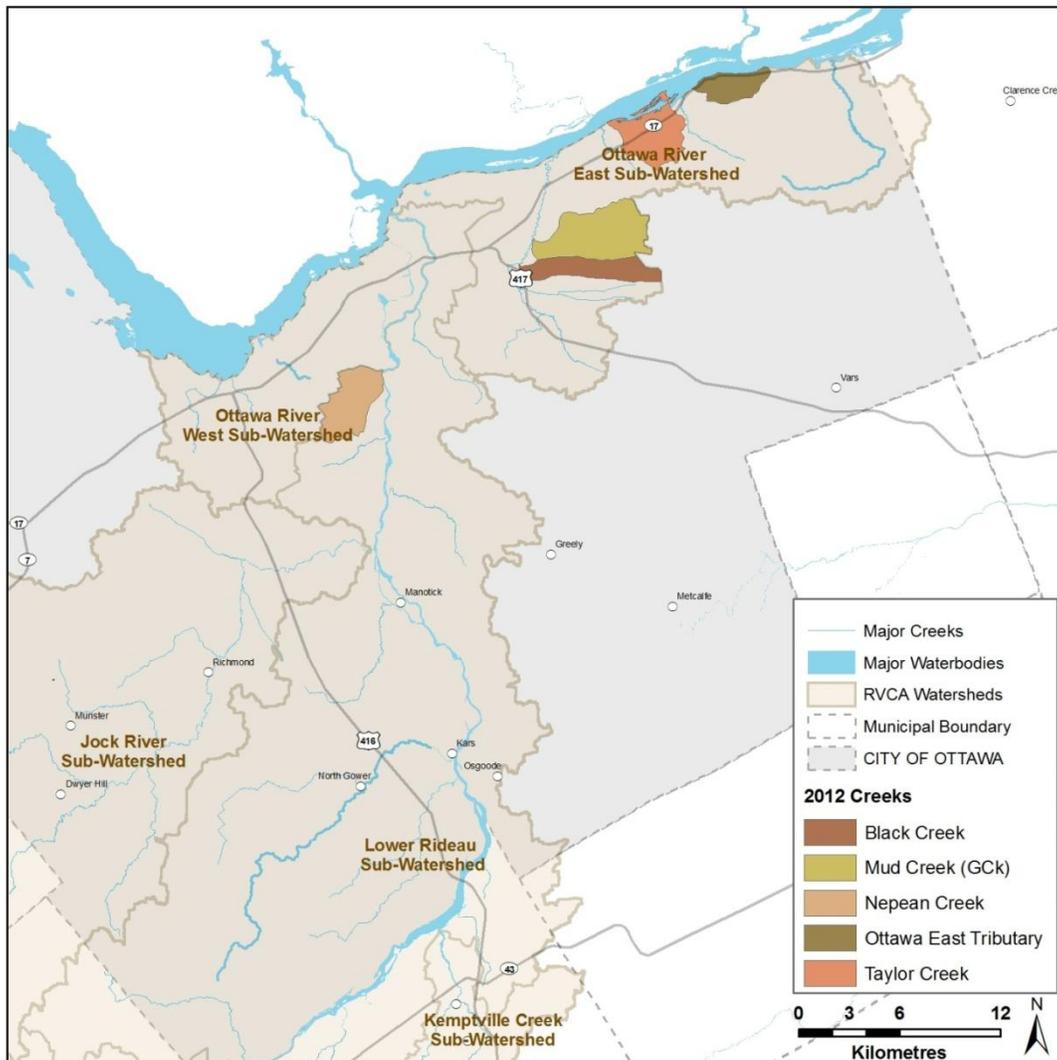


Figure 11. Locations of 2012 Monitoring Locations

There will be many opportunities to assist with:

- Stream habitat surveys
- Fish community sampling
- Bioengineering projects (creating erosion control structures from willows and dogwoods)
- Stream garbage cleanups
- Riparian plantings on Nepean Creek, Becketts Creek, Sawmill Creek, Stevens Creek
- Yellow iris removal on Green's Creek

To volunteer with City Stream Watch projects, contact:

City Stream Watch Coordinator

613-692-3571

[citystreamwatch@rvca.ca](mailto:citystreamwatch@rvca.ca)

<http://www.rvca.ca/programs/streamwatch/index.html>



# City Stream Watch 2011 Summary Report

## Acknowledgements

**A huge thank you to all of our 2011 volunteers. You continue to make our program successful and contribute to important rehabilitation and data collection projects along our urban streams.**

**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, sponsoring our summer student and recruiting club members for City Stream Watch projects.

Thank you to **Bill Graham** for organizing the “Adopt a Stream” volunteers for Green’s Creek.

Thank you to **Peter Stewart-Burton** of the **National Defense Headquarters Fish and Game Club** for helping to recruit volunteers for the Sawmill Creek cleanup and for continuing “Adopt a Stream” on the south end of Sawmill Creek.

Thank you to **Greg** of the **Heron Park Community Association** for beginning the “Adopt a Stream” pilot on the north end of Sawmill Creek.

Thank you to **Gemma Kerr** of the **Urban Rideau Conservationists** for all the organizational work for the Mother’s Day Cleanup on the Rideau River.

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

Thank you to **Tom Spears** of the **Ottawa Citizen** for his continuing interest in our City Stream Watch.

Thank you to the **RVCA’s Making Shorelines Natural Project** for organizing the 2011 shoreline plantings and developing new projects with City Stream Watch.