URBAN
Urban – Rural
Biomonitoring &
Assessment Network

URBAN, a Citizen-Science Program Based in Hamilton, Ontario

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Urban-
Rural
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Network

What does URBAN do?

- Increase public awareness of health of aquatic habitats in settled areas of Ontario
- Coordinate monitoring activities with other provincial/national environmental groups
- Liaise with local agencies
- Engage citizens in long-term monitoring of streams and wetlands in Hamilton

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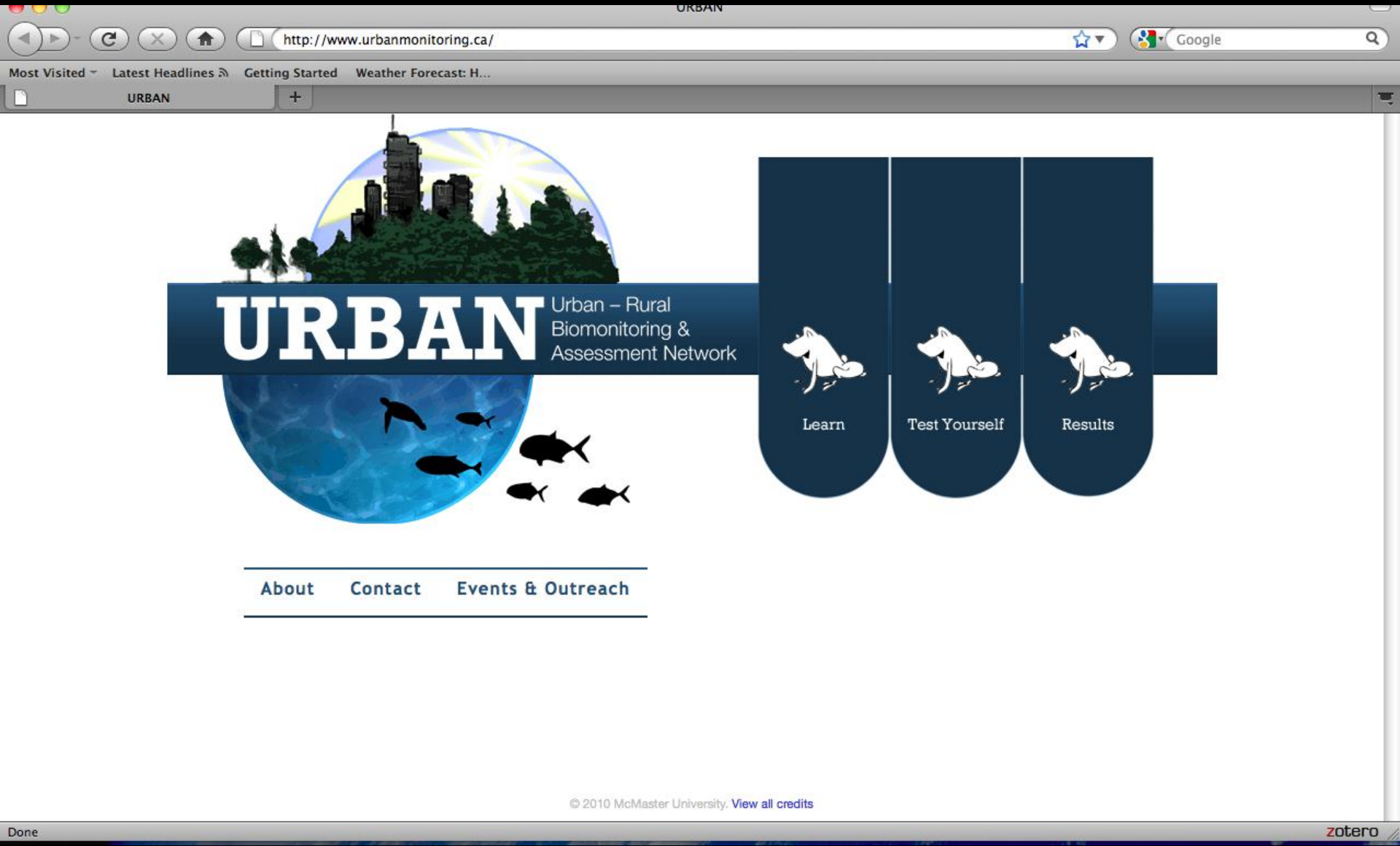
Interactive website



Learn

How to use these training modules

Simply click on the group of organisms that you want to learn about from the choices to the right. In each module, you will learn how to identify various species from each group using sight and/or sound. Have fun finding out what that bird is singing outside your window on summer mornings, or that frog calling all night from the pond in your backyard. Each module also contains how these species are important to the functioning of ecosystems and how they help to meet our everyday human needs of freshwater and clean air.

Why are these species/ecosystems so important?

Sometimes it is easy to look at a wetland or stream and only see what they are on the surface, what we can see as humans. The truth is, these systems are constantly at work. The plants are continuously converting carbon dioxide into oxygen using the power of the sun, and the animals living with these plants act as links to transfer energy and nutrients throughout the ecosystem. Simply click on the group of organisms that you want to learn about and in each module, you will learn how these species/natural areas contribute to the health of our ecosystems. The provisions of ecosystems of this planet globally has been estimated to be between $16 – 54 trillion US dollars per year! (Rapport et al. TREE 1998), and this value must be considered an absolute minimum because we still do not fully understand ecosystems and their intricate frameworks.

Wetland Birds

Least Bittern (*Ixobrychus exilis*)

Coastal marshes of the Great Lakes have been primarily recognized for their importance as waterfowl nesting and breeding grounds and migratory habitat (National Wetlands Working Group 1988). These habitats are also important nesting and breeding grounds for several wetland-dependent rails, bitterns, and songbirds. Wetland-dependent species require marsh for nesting and feeding, often building floating nests and foraging primarily in the moist soil or aquatic areas for invertebrates and small fish. Birds are important components of the ecosystem because they disperse seeds, pollinate plants, and control invertebrate and vertebrate pest populations (Sekercioglu 2006). Regardless of

Learn
- Water Quality
- Wetlands
  - Amphibians
  - Wetland Birds
  - Wetland Plants
- Streams
  - Benthic Invertebrates
- References

Volunteer recruitment: April URBAN workshop

Presentation

Field demonstration

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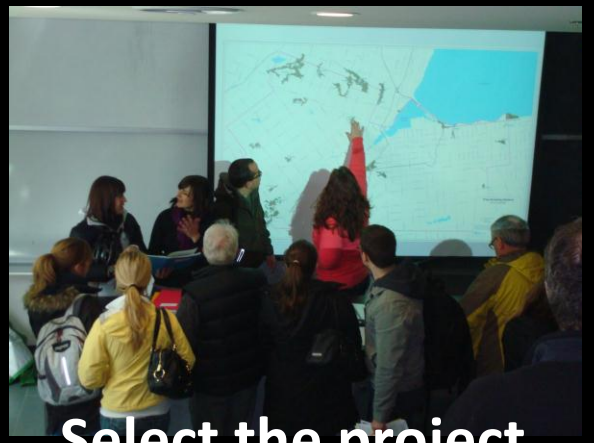
Questions & Answers

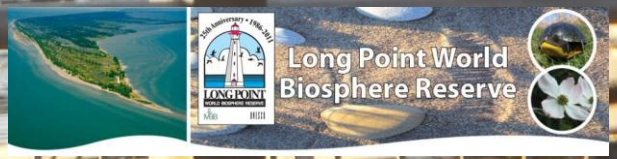


Select the project

Providing field experience and training for volunteers

Public education at Hamilton Harbour

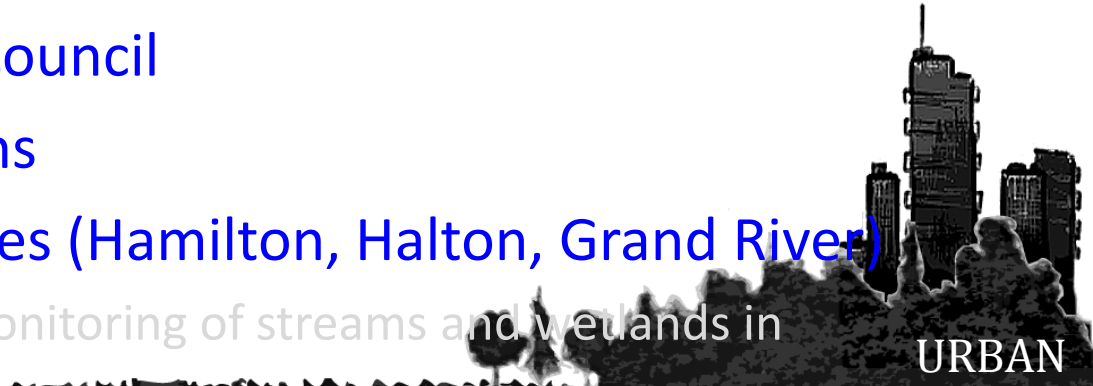
- Hire undergraduate and high school interns to communicate with public re: URBAN activities at the waterfront
- Made presentations to other regions
  - Long Point Biosphere Reserve
  - Lake St. Clair Region Conservation Authority
  - Niagara College



St. Clair Conservation

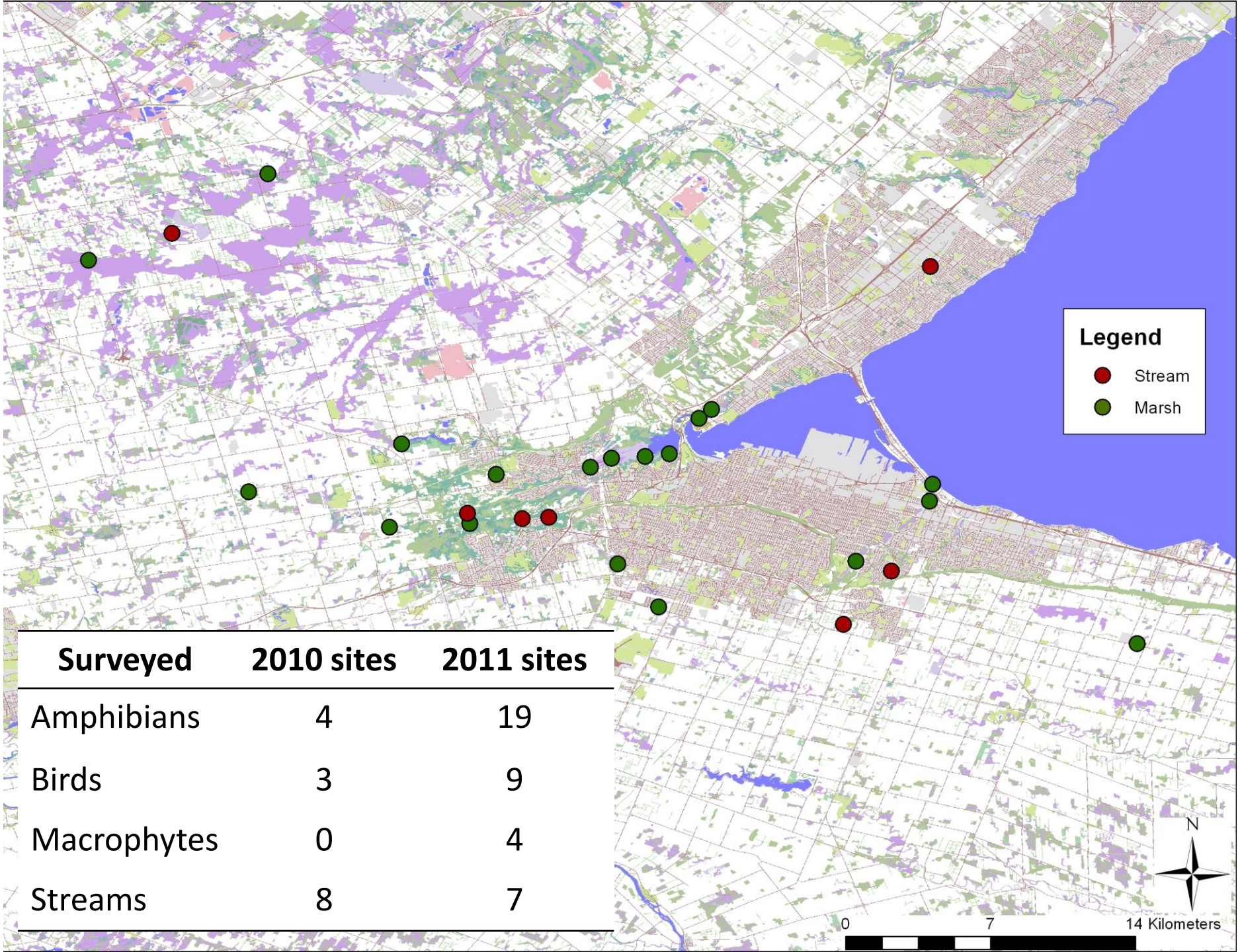
What does URBAN do?

- Increase public awareness of health of aquatic habitats in settled areas of Ontario
- Coordinate monitoring activities with other provincial/national environmental groups
  - Marsh Monitoring Program (amphibians and marsh birds)
  - Ontario Benthos Bio-monitoring Network (stream invertebrates)
- Liaise with local agencies
  - Bay Area Restoration Council
  - Royal Botanical Gardens
  - Conservation authorities (Hamilton, Halton, Grand River)
- Engage citizens in long-term monitoring of streams and wetlands in Hamilton



Long-term monitoring of streams and wetlands

- **Use well established protocols developed in provincial or national programs**
  - **O**ntario **B**enthos **B**io-monitoring **N**etwork
  - **M**arsh **M**onitoring **P**rogram
  - **V**olunteer **A**quatic **P**lant **S**urvey Guide



Surveyed	2010 sites	2011 sites
Amphibians	4	19
Birds	3	9
Macrophytes	0	4
Streams	8	7

Report Card: 20 Mile Creek Marsh

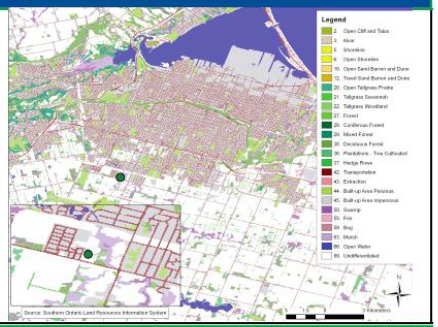
About the site
Headwaters of 20 Mile Creek
Sampled in 2010 and 2011
Hamilton Conservation Authority

Why is this marsh important?

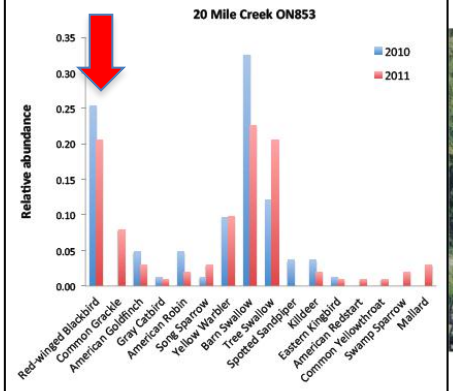
–Wetland in an urbanizing area

–Creek flows out of the wetland to the Niagara River Area of Concern

Map



Bird community



Aerial photo

Variable Measured	2010	2011
Total number of birds	83	102
Average number of birds per point count	21	17
Total species richness (number of species)	14	15
% wetland-dependent birds	0%	6.7%
Index of Marsh Bird Community Integrity (IMBCI; DeLuca et al. 2004)	1.07	2.73

Overall status: Wetland-dependent bird community needs improvement.

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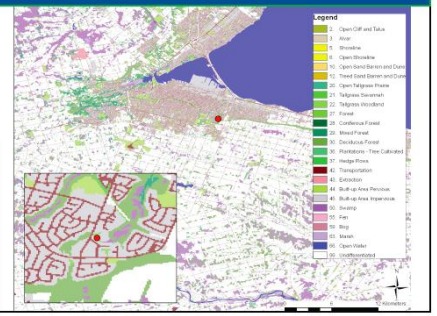
Report Card: Felker Creek

About the site
Felker Creek near Red Hill and King St.
Sampled 2010 and 2011
Hamilton Conservation Authority

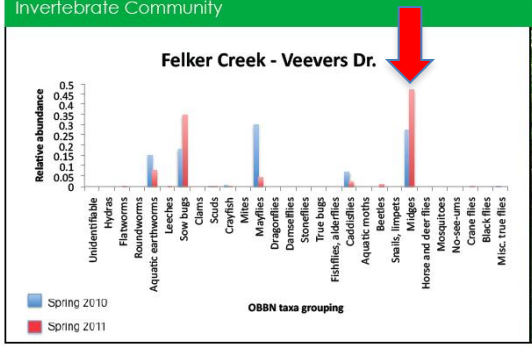
Why is this stream important?

- Urban creek

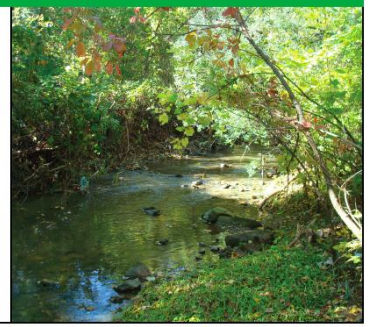
Map



Invertebrate Community



Site Photo



Variable Measured	2010	2011
Total number of invertebrates	330	369
Average species richness (number of species)	6	7
% pollution sensitive taxa (%EPT) (Mayflies, stoneflies, caddisflies)	38.1	6.9
% pollution tolerant taxa (Aquatic worms, midges)	43	55.6

Water Quality	2010	2011		2010	2011
Total Phosphorus (µg/L)	102.41	25.58	**pH**	8.17	8.55
Total Nitrogen (mg/L)	2.7	0.0	**Conductivity** (µS/cm)	1333	405
Chlorophyll a (µg/L)	1.23	3.56	**Turbidity** (NTU)	4.97	4.43

Overall status: Keep monitoring to determine if trends are long-term.

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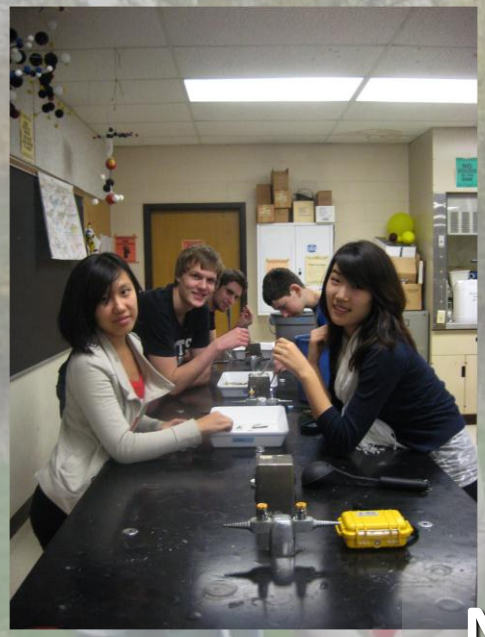
  - Training citizen scientists, including high school and undergraduate students

Empowering students



McMaster U.
Senior projects

Nelson High School Environment Club

2012: Intensive 2-week field course: Focusing on the "R" in URBAN

10 undergrad students
2 Professors
2 Graduate students
2 Senior Undergrads

Indicators of Ecosystem Health

Program evaluation

Major Task category	2010 and 2011
Volunteers who attended workshops	105
Classes visited at McMaster University (total students present)	4 (900)
Classes visited at local high schools (total students present)	5 (> 175)
MMP surveys completed (amphibian and birds combined)	35

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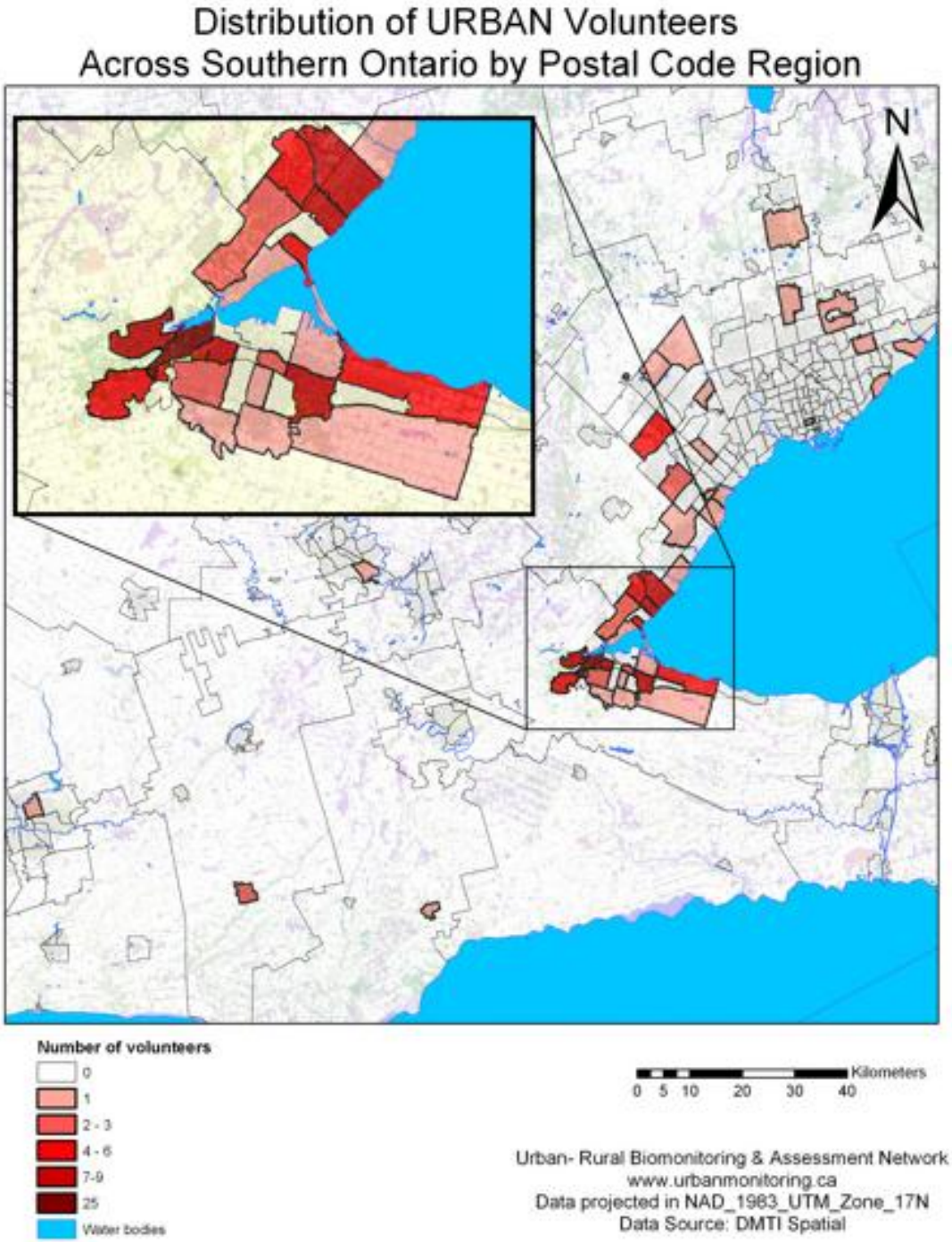

Participants from the Hamilton watershed and beyond, including city of Oakville and Toronto

Participants of ages from 10 to 80

URBAN Year-end receptions


Reporting Results

Volunteer appreciation


David Miller, former mayor of Toronto on “Green Cities”

Communicating with partners and public


Mingling with volunteers


Guest speakers

Future of URBAN?

Funding!!

- $1.5 million 10-year gift to McMaster University from RBC Foundation (Bluewater Project in 2010)
  - Renewable annually
  - Must not focus on research
- **URBAN** is one of 5 projects funded annually since 2009
  - Decision made in December by Dean
  - Funding not guaranteed—turnover in staff
  - Institutionalize activities through undergraduate courses and senior projects
  - Create a new stream in Environmental Life Science at McMaster with three new courses

Future of URBAN?

Environmental Life Science

- Courses to support updating inventory and mapping of wetlands and streams in Hamilton area (can expand to adjacent urban areas)
- Two field courses offered in the summer to conduct the field work and lab analyses
- Projects to create report cards for each wetland and stream
- Presentations to public and agencies at Year-end reception by students

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- ***Additional fund- and friend-raising??***

RBC Foundation®

Many thanks to: