

What is the Bay Area Restoration Council (BARC)?

BARC is a not-for-profit organization that is working to clean up Hamilton Harbour and its watershed. Hamilton Harbour was once clean and pristine, people could hunt and fish and swim safely. However, because the Harbour is connected to Lake Ontario, it became an industrial port. Many people moved into the area, and before we knew it we had lots of problems including industrial pollution, invasive species, infilling of the Harbour, loss of fish and wildlife habitat, and urbanization of the land. By 1960 it was illegal to swim in Hamilton Harbour because it was so polluted.

In the 1980s the International Joint Commission (IJC) labelled Hamilton Harbour as an Area of Concern (AOC). An AOC is a pollution hotspot. We are one of 43 Areas of Concern on the Great Lakes, which means we are one of 43 of the most polluted sites on the Great Lakes.

Once a body of water is listed as an AOC, the law requires that a Remedial Action Plan (RAP) be created. A RAP is a work plan for all the things that need to be done to get the water body off the AOC list. The Hamilton Harbour RAP is very special and successful because unlike many other RAPs, it uses a stakeholder approach. This means all levels of government, industry, Conservation Authorities, other organizations, and the public all work to together on actions to improve the Harbour.

BARC is the community group for the Hamilton Harbour RAP. We help to engage members of the community in the cleanup of the Harbour. We offer school programs, plantings, community workshops and events – all related to Hamilton Harbour!

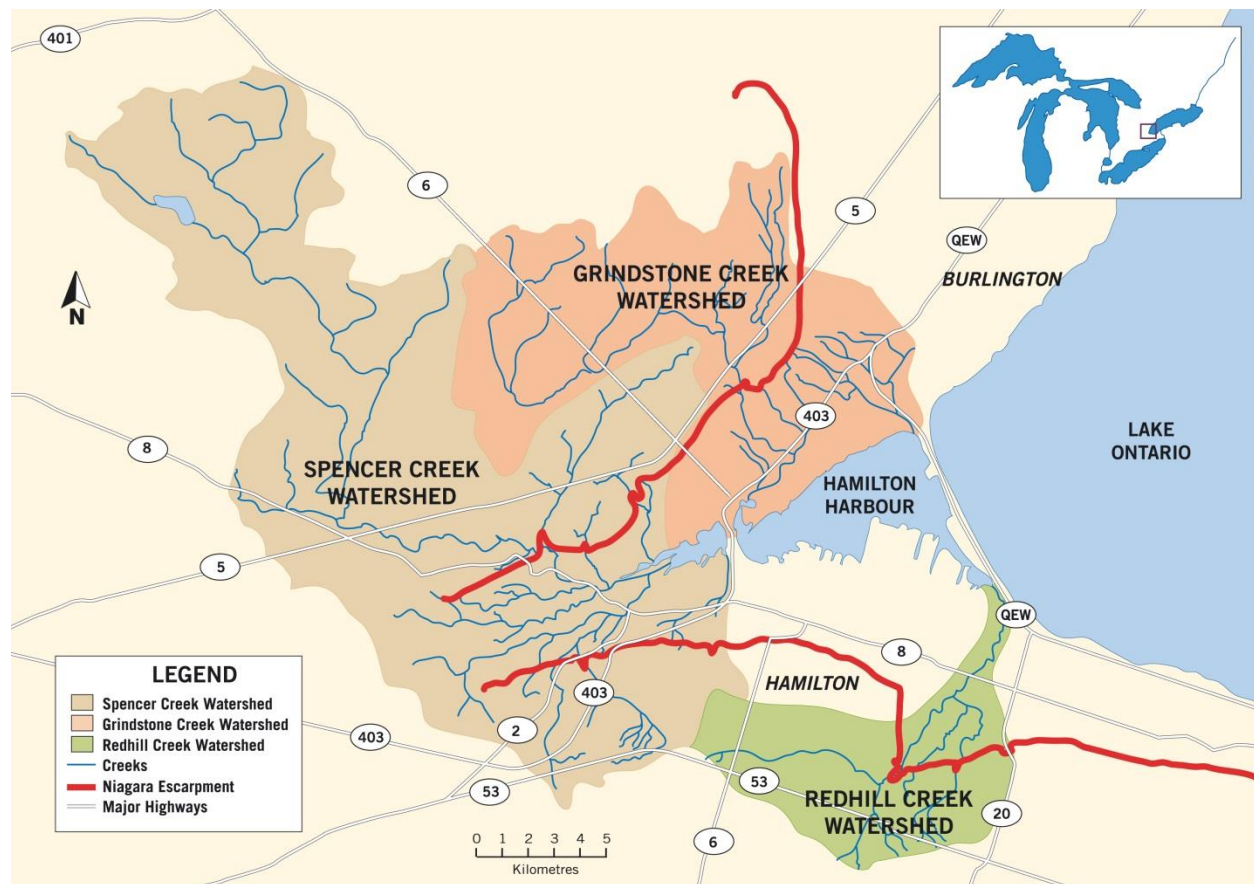
For more information on BARC or the Hamilton Harbour RAP please visit www.HamiltonHarbour.ca

The Hamilton Harbour Watershed

A watershed is an area of land that drains all the surface water into the same place, such as a creek, stream, wetland, or lake. The Hamilton Harbour watershed is the area of land where streams and precipitation empty into the Harbour. The image below depicts the Hamilton Harbour watershed and some of its larger creeks, but there are also many smaller ones not shown here. It is estimated that 750,000 people live in the Harbour watershed. That's over half a million people that on a daily basis, have the potential to impact the Harbour's water quality. Even people that feel like they live far away from the Harbour may live near a creek within the watershed! The Harbour watershed is a mix of private, public, residential and industrial lands. The red line indicates the Niagara Escarpment.



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Other BARC School Programs

Yellow Fish Road™ is a program, in partnership with Trout Unlimited Canada that educates students and the public about the impacts of pollution entering urban storm drains. Yellow Fish Road™ volunteers paint yellow fish symbols beside storm drains, add an adhesive disk with the message “Only Rain Down the Drain”, and distribute fish-shaped brochures to nearby households. This program reminds people to properly use and safely dispose of hazardous household chemicals, rather than allowing them to enter curbside storm drains. A BARC staff person attends each event to give a 30-minute presentation about Hamilton Harbour and combined/separate sewer systems prior to the painting activity.

Stream of Dreams™ was created by the Stream of Dreams Murals Society in Burnaby, British Columbia when a chemical spill nearly destroyed a local creek. The program educates students and communities about Hamilton Harbour and its watershed, while dazzling them with the beauty of community art. It is a two-part workshop where students receive environmental education in one component and paint their own dream fish in the other component. All fish are hung together on a nearby fence as a large mural.

The beauty of Stream of Dreams™ is that whole schools participate, rather than just one class. The murals are made of hundreds of fish and are very visible in the community. BARC delivers this program to three or four schools each year.

Water School, in partnership with Green Venture and the Hamilton Waterfront Trust, engages grade 6 and 7 students in hands-on activities related to Hamilton Harbour and water protection in general. Participants take a field trip to the harbourfront HWT Centre and take part in presentations, workshops and a tour on the Hamilton Waterfront Trolley. Participants learn about the history of Hamilton Harbour and efforts to delist it as a pollution hot spot.

RAINGERS is a schoolyard rain garden program. Rain gardens are sunken gardens designed to capture, absorb and filter stormwater. They can be used as teaching gardens in any grade level and are wonderful resources for enhancing science, social studies, creative writing and art. Rain gardens offer an opportunity to teach about plant adaptations as students learn about the deep rooted species in this type of garden and their efficient manner of removing deadly pollutants. These gardens can be a powerful tool to make connections between land development, water quality, and personal actions.

Creeks and Creepy Crawlies: Available to grades 1-4, Creeks and Creepy Crawlies directly addresses the issue of watershed pollution using kinesthetic learning. Our mobile, classroom lab allows students to examine a number of preserved aquatic invertebrate specimens in detail from local creeks and rivers, linking their ecology to water quality and human activity, with special emphasis on the role individuals play in restoring the Harbour's health. Students will participate as citizen scientists, engaging in a presentation, bug lab and creepy crawly craft. Dependent on the grade participating, the program lasts approximately 1 hour.

From Home to Harbour: BARC's latest educational program is a series of classroom presentations developed for grades 5-12. The presentations engage students across the Hamilton Harbour watershed in a variety of subjects from water systems to the role of government and responsible citizenship. From Home to Harbour presentations range in length from 40 minutes to one hour and align with Ontario Curriculum objectives.



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Classroom Mini Marsh Planting Instructions

Most marsh plants die back in the fall and over-winter as a dormant root or bulb ('rootstock'). The rootstock is collected and stored in plastic bags in the refrigerator. In the spring, the material is placed back in the mud while it is still dormant. As the temperature warms, the rootstock sprouts into new plants. You can watch this happening in your Classroom Mini Marsh!

Your kit contains the following:

- A bag of soil
- A bowl
- A planting tray with 4 pots
- A bag containing four native marsh plants and a snail
- Resource materials

Setting up your kit is easy:

If you are not going to plant your Mini Marsh right away, keep it in the refrigerator until planting day. This will keep your snail dormant and happy until you are ready to create your marsh. Do not put it in the freezer!

- 1) Fill the planting tray with soil.
- 2) Look for your snail and set it aside. Look carefully, some snails can be small.
- 3) Bury the plants (except duckweed) in the tray so that only the green parts of the plants are exposed above the surface. Put one plant in each of three pots (the 4th pot will be soil only).
- 4) Place the planting tray in the bowl and fill the bowl 2/3 with soil (soil does not need to reach the top of the planting tray).
- 5) Fill the bowl gently with tap water (it is easiest to pour it from a pitcher). The water may be cloudy for several hours depending on the type of soil in your kit. This will settle out and clear over time.
- 6) Rinse the bag containing the plants (now it contains only duckweed) to loosen the duckweed and pour it into the Mini Marsh. Duckweed will serve as food for your snail. You may not have much duckweed to start with, but it will grow quickly.



- 7) Add the snail to the bowl. The snail will come out of its shell and start looking for food after it is settled.
- 8) Keep the water level high throughout the program. Both the plants and the snail are water loving organisms and will not survive if dry for too long.
- 9) Feed the snail bits of lettuce if the duckweed has been consumed. If it is hungry, the snail will begin roaming outside of the bowl to look for food!

**** An important note about your snail:**

Your snail has been hanging out with many other snails before becoming a part of your Mini Marsh. Do not be surprised if your snail lays eggs. These will look like gelatinous blobs with small dots inside. Shortly after the eggs will hatch into young snails! If this happens be sure to add extra lettuce to keep the new snails fed.

Included in this manual is a description of each of the plants in your kit. These descriptions indicate what the plant will look like in its flowering stage. Plants may not be distinguishable until they begin to grow.

Important Things to Remember

- 1) Your plants **MUST** have sunlight.
Without enough light your plants will not grow. Place plants in a sunny window. If you do not have a sunny window consider purchasing a grow light, your plants will thank you!
- 2) Return your plants to the RBG Nature Centre to be planted in Cootes Paradise.
By returning your plants at the end of the school year you will be directly helping in the restoration of Cootes Paradise! You do not need to call ahead – simply deliver your kits to the Nature Centre. If the Centre is closed you can leave your kits on the doorstep. You can return whole kits or just the plants and snails.
- 3) Return an evaluation form.
Program funding is dependent on feedback! To ensure continuation of the program please return an evaluation form. We welcome positive feedback and constructive criticism equally. Ideally each class should fill out a separate evaluation form, rather than one for the whole school.
- 4) Send us your photographs!
We are always looking for photos to use in our newsletter, website and other media. So if you have neat shots of your mini marsh and students in the classroom, please email them over to BARC at kpik@hamiltonharbour.ca We will assume that all photos you send us are safe for publication!



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Plant List and Fact Sheet

Included in this manual is a description of each of the plants in your kit. These descriptions indicate what the plant will look like in its flowering stage. Plants may not be distinguishable until they begin to grow.

Acorus calamus – Sweet Flag

Root Stock: almost horizontal, thick, forming dense strands

Characteristics: Herbaceous perennial

Height: Up to 4 ft

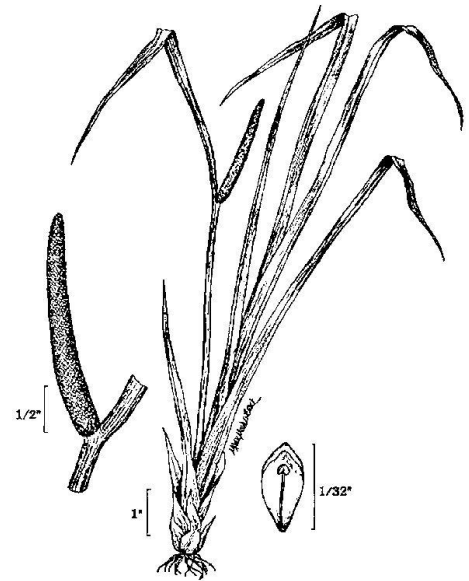
Flowering Period: May - July

Flowering Description: Tiny flowers clustered into a long inflorescence

Habitat: ditches, marshes, river edges and ponds

Shade: Full sun to partial sun

Leaf Description: Sword-shaped



Scirpus validus – Softstem Bulrush

Root Stock: orange/brown rhizome about 6 cm long with stringy roots

Characteristics: Herbaceous perennial

Height: up to 10 ft

Flowering Period: June – September

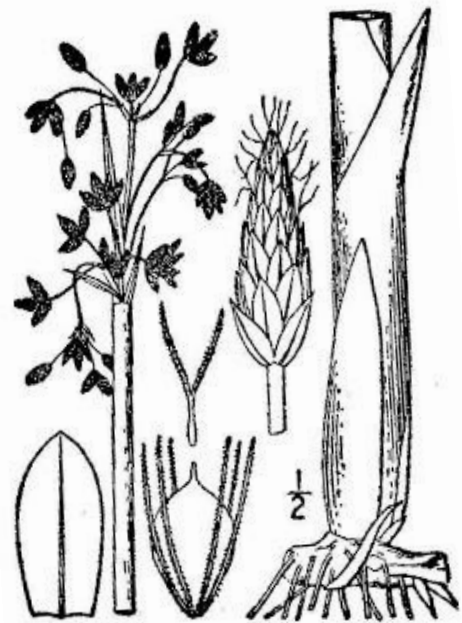
Flowering Description: Hanging clusters of brown spikelets

Habitat: Marshes, shores

Shade: Requires full sun

Wildlife Benefits: Food for marshbirds, muskrat, fish
Nesting for bluegills, largemouth bass

Leaf Description: straw-like, rounded, easily squished



***Sparganium eurycarpum* – Giant Bur-reed**

Root Stock: 6 – 12 cm long with pink shoots

Characteristics: Herbaceous perennial

Height: up to 7 ft

Flowering Description: Small, greenish in ball-shaped heads

Flowering Period: May - August

Habitat: Marshes, shallow waters, swamps, muddy shores

Shade: Tolerates partial shade

Wildlife Benefits: Food for waterfowl, muskrat, deer,
cover for marsh birds and waterfowl

Leaf Description: V shaped, strong mid-vein



***Lemna minor* – Small Duckweed**

Characteristics: Uprouted floating aquatic perennial

Flowering Period: July - August

Habitat: Lakes and ponds, slow moving streams

Shade: Tolerates partial shade

Wildlife Benefits: Food for waterfowl, beaver, muskrat,
small mammals

Leaf Description: Free-floating, stem lacking, less than
¼ inch wide

Lemna minor
Duckweed

