

What is the Bay Area Restoration Council (BARC)?

BARC is a non-profit organization that is working to clean up Hamilton Harbour and its watershed. Hamilton Harbour was once clean and pristine; people could fish and swim safely. However, its connection to Lake Ontario made the Harbour an ideal location for industry, and Hamilton soon became an industrial port. Environmental problems in Hamilton Harbour include 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. BARC is the community voice for the Hamilton Harbour Remedial Action Plan (RAP), the overall plan to delist Hamilton Harbour as an AOC. BARC offers 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

Other BARC programs

Creeks and Creepy Crawlies: *Grade: 1 - 4*

Creeks and Creepy Crawlies allow students to examine a number of preserved aquatic invertebrate specimens in detail from local creeks, linking their ecology to water quality and human activity. Participants receive a short presentation, view preserved specimens, and make a craft. ***Open to schools that have not previously participated.*

From Home to Harbour: *Grade: 5 – 12*

From Home to Harbour is a series of classroom presentations that engage students in a variety of subjects from water systems to the role of government and responsible citizenship. Presentations align with the Ontario Curriculum and are approximately 30 minutes long.

Rangers Rain Gardens: *Grade: 3 - 12*

Rangers educates students about stormwater management in Hamilton. The program includes environmental education and the **building of a rain garden**, a sunken garden planted with deep-rooted native plants and grasses designed to capture, absorb and naturally filter stormwater.

Stream of Dreams™: *Grade: K- 8*

Stream of Dreams™ educates students and communities about Hamilton Harbour and its watershed, while engaging them in a community art project. Students receive environmental education and then paint a wooden fish. All fish are hung on a nearby fence as a large mural. This program is delivered to an entire school rather than just one class.



Water School: *Grade: 6 and 7*

Water School engages students in hands-on activities related to Hamilton Harbour and water protection. Participants take a field trip to the Hamilton Waterfront Trust (HWT) Centre to take part in presentations, workshops and a guided tour on the Hamilton Waterfront Trolley. The workshop includes your choice of a stewardship art project or a miniature vermicomposting bin for the classroom.

Yellow Fish Road™: *Grade: 3 - 8*

Yellow Fish Road™ educates students and the public about the impacts of pollution entering urban storm drains. Participants paint yellow fish symbols beside storm drains and distribute fish-shaped brochures to nearby households. This reminds people to properly use and safely dispose of hazardous household chemicals.

Cootes Paradise Fact Sheet

What is Cootes Paradise?

- Cootes Paradise is a large wetland located on the western edge of Hamilton Harbour.
- A wetland is an area of land that is covered in water (this can be all year round or just during certain seasons). Wetlands are covered by unique plants that are suited to living in wet conditions. Sometimes a wetland is also called a marsh.

Why are wetlands so important?

- Wetlands are home to many plants and animals. They are also excellent fish nurseries.
- Marsh plants help to remove pollutants from the water.
- Wetlands hold water like a sponge and help to prevent flooding.
- Wetland plants help to prevent erosion (the plants keep the soil from washing away).
- Wetlands are so good at cleaning the ecosystem that they are often compared to kidneys!

What's wrong with Cootes Paradise?

- Most of the plants in the marsh have been destroyed. One big reason is because of fish called carp. Carp are not native to Ontario and they uproot plants while looking for insects to eat on the bottom of the marsh.
- Without plants the soils at the bottom of the marsh are stirred into the water. This can bury animal homes and cause them to choke.
- Nutrients (phosphorous and nitrogen) from streams are entering the marsh. The nutrients cause large blooms of algae (algae are tiny plants that can grow out of control). Algae blooms result in less oxygen and prevent sunlight from entering the water.

What's being done to make Cootes Paradise healthy again?

- A fishway was built to keep carp out of the marsh. Classes can visit the fishway and see fish up close.

- Used Christmas trees have been used to build up old marsh channels that were lost.
- Other projects have helped to restore parts of the marsh. (visit www.rbg.ca for more information)
- Native plants are being added back into Cootes Paradise.

What can YOU do?

- Take a trip to the fishway and learn more about carp and other fish!
- Plan a trip to Cootes Paradise, and remember to stay on the trails. Marsh plants and animals are sensitive and can be easily trampled.
- Return your Classroom Mini Marsh to the Royal Botanical Gardens to be planted in Cootes Paradise!

The Benefits of Marsh Plants

Food

The stems, roots, leaves and seeds of aquatic plants are eaten by a variety of wildlife. Certain waterfowl will eat the leaves and stems, while other bird species will eat the seeds. Animals such as otter, beaver, turtles and deer will also graze on aquatic plants.

Shelter

Aquatic plants provide cover from predators. This is especially important for young fish and amphibians.

Habitat

Aquatic plants provide living quarters for many insects and small crustaceans. These organisms are an important food source for larger animals.

Material for Building Homes

The strong stems of aquatic plants make excellent nest and den materials for a variety of wildlife such as birds and muskrat.

Erosion Control

Aquatic Plants help to keep sediments in place. This prevents sediments from being stirred into the water column during wave action. Sediments can harm aquatic life and prevent sunlight from penetrating the water column.

Removal of Pollutants

Aquatic plants are known to filter contaminants from wetlands and are often considered as an indicator of water quality conditions. Aquatic plants also absorb phosphorous (which would otherwise cause algae blooms) and other nutrients.



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Classroom Mini Marsh Planting Instructions

Your kit contains the following:

- A bag of soil or sand
- A bowl
- A planting tray with 4 pots
- A bag containing five 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 (there is no need to add additional soil to the bowl).
- 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 romaine lettuce if the duckweed has been consumed. If it is hungry, the snail will begin roaming outside of the bowl to look for food! You can also feed fish food or other veggies such as zucchini, cucumber or red pepper.

** 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 food to keep the new snails fed.



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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.
BARC staff will coordinate the pickup of your Mini Marsh kits at the end of the school year. Some schools may not be eligible for pickup depending on location.
- 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. We will send you a link to an electronic evaluation at the completion of the program.
- 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 swatts@hamiltonharbour.ca We will assume that all photos you send us are safe for publication!



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Plant List and Fact Sheet

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

Characteristics: Herbaceous perennial

Height: Up to 4 ft

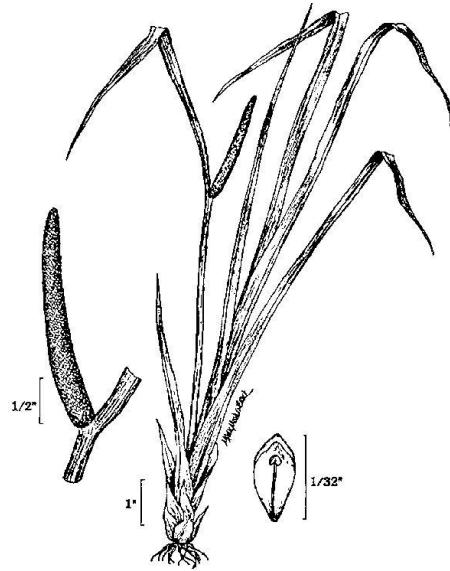
Flowering Period: May - July

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 tapering into a point



Iris versicolor – Blue-flag Iris

Characteristics: Herbaceous perennial

Height: up to 4 ft

Flowering Period: May – July

Flowering Description: Large, blue/violet, 3 petals

Habitat: Marshes, swamps, wet meadows, along shorelines, and in forested wetlands

Shade: Tolerates partial shade

Wildlife Benefits: Root stock is fed upon by aquatic rodents

Leaf Description: Sword-like, more than 1cm wide



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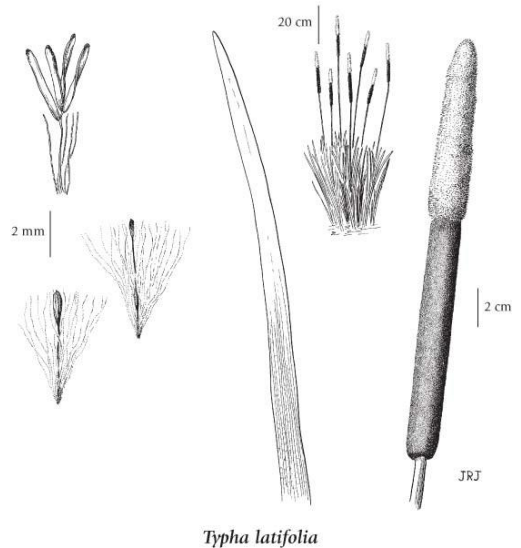
***Scirpus atrovirens* - Dark-green Bulrush**

Characteristics: Herbaceous perennial
Height: 3ft – 6ft
Flowering Description: Inflorescence of small green flowers
Flowering Period: June - August
Habitat: Marshes, stream banks, ponds, rain gardens
Shade: Full sun
Wildlife Benefits: Seeds are eaten by ducks, Canadian geese, and other fowl; muskrats will eat the rootstock
Leaf Description: Smooth, linear, slight “M” shape



***Typha latifolia* – Broad-leaved Cattail**

Characteristics: Long upright leaves
Height: 3ft – 9ft
Flowering Description: A soft brown spike
Flowering Period: June - August
Habitat: Marshy areas
Shade: Full sun
Wildlife Benefits: Provide food and shelter for wildlife
Leaf Description: Long, thin, upright leaves



***Lemna minor* – Small Duckweed**

Characteristics: Uprooted 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

