

Fact Sheet



Royal Botanical Gardens

2021 Marsh Status

Plant Species

Emergent Species

- American Bulrush
- Blueflag Iris
- Broad-leaved Cattail
- Broad-leaved Arrowhead
- Common Reed
- Lakebank Sedge
- Flowering Rush
- Giant Burreed
- Hardstem Bulrush
- Narrow-leaved Cattail
- Narrow-leaved Arrowhead
- Pickeral Weed
- River Bulrush
- Prairie Cordgrass
- Softstem Bulrush
- Southern Wild Rice
- Sweetflag
- Water Arum
- Watercress
- Water Plantain
- Water Smartweed
- Water Loosestrife
- Yellow Iris

Submergent Species

- Brittle Naiad
- Common Bladderwort
- Canada Waterweed
- Coontail
- Curly-leaved Pondweed
- Eurasian Milfoil
- Flat stemmed Pondweed
- Floating-leaved Pondweed
- Horned Pondweed
- Leafy Pondweed
- Long-leaf Pondweed
- Sago Pondweed

Floating Leaf Species

- Greater Duckweed
- Lesser Duckweed
- Star Duckweed
- White Water lily
- Yellow Water Lily



Quick Facts

Two Wetland Systems, Cootes Paradise and Grindstone Marsh

Total Wetland Area: 410 hectares

Total Shoreline: ~30km

Most Common Species

Sago Pondweed

Amphibian: Green Frog

Fish: Gizzard Shad

Bird: Red-winged Blackbird

Marsh Restoration Progress

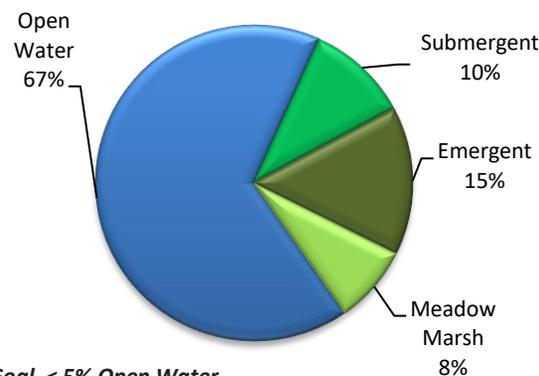
2021 marked a positive change from the past five years of decline for Cootes Paradise Marsh. Grindstone Marsh continued as largely degraded, with a few pockets of healthy habitat. Changes were spurred by the lowest water levels since the 1960s, removing problematic water. This exposed plant-less mudflats allowing for large scale seed germination and growth of a mixture of emergent vegetation. The new plants were dominated by cattails, but also included invasive species such as Phragmites and European Manna Grass.

In Cootes Paradise the growing season began with extensive rafting algae as the marsh began to grow life again. By late spring scattered patches of submergent plants began to appear throughout the marsh, with Curly-leaf Pondweed the most common. The meadow marsh ponds, all now without carp, returned to clear water, and grew a cross section of plant species including hundreds of wild rice plants. However, one pond, West Pond, was once again dominated by algae, with the pond essentially 100% covered by a large contiguous raft in July. The pond is hypereutrophic fed by the treated sewage effluent of the community of Dundas. West Pond was able to regenerate some water lilies following a near 100% loss in 2020, but with leaves struggling within the algae.

Grindstone Marsh is a mixture of conditions,

Including areas exposed to runoff and stressors and carp, semi protected areas, and meadow marsh ponds. In 2021 the Meadow Marsh ponds returned to a rich diversity of plants, dominated by white waterlily, burreed, and cattail, returning to clearwater without carp again. The semi protected areas associated with berms constructed of Christmas trees and soil had large mudflats germinating emergent seedlings, and variable aquatic plant growth due to carp gaining access to them via beaver tunnelling. Long Pond/ Sunfish Pond area continued the ongoing regeneration with white water lily now becoming a dominant plant. The unprotected area, Carrolls Bay, and largest portion of the marsh continued to only grow algae in the form of phytoplankton.

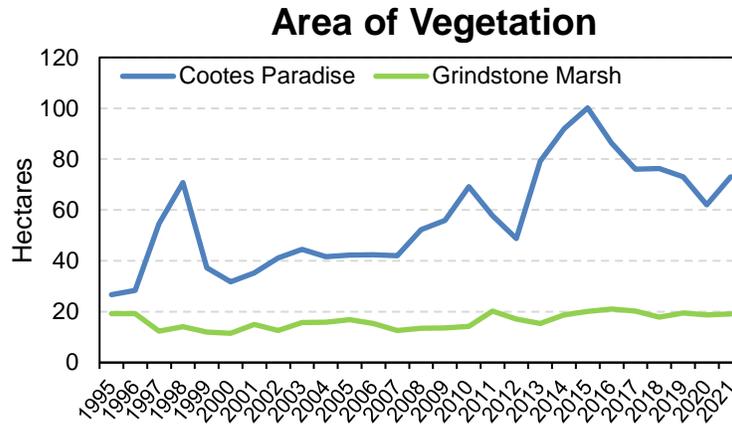
2021 Wetland Habitat Areas



Goal < 5% Open Water
2017 Water Clarity – 39 cm

Marsh Vegetation Trends

In a healthy marsh, water level fluctuations create the pattern of submergent, emergent and meadow marsh plants. By 1990 virtually all submergent and emergent plants were lost from Cootes Paradise Marsh, the water was hypereutrophic, muddy, ecosystems had collapsed, and attempts of carp management abandoned. Grindstone Marsh was only in slightly better condition, with patches of plants found only in the outer marsh. A century of inflowing sewage, watershed erosion and invasive species had destroyed them. In 1997 through the RAP a new barrier to exclude large carp became functional at the entrance to Cootes Paradise. A barrier for the Valley Inn area of Grindstone Marsh was never installed. RBG constructed an alternate system in the area, completed in 2001. The unprotected area of the marsh no longer hosts marsh plants.



Since 1997 Cootes Paradise aquatic plant growth varies from year to year. Extensive rafts of algae still overwhelm these plants, caused by the excess of nutrients and sediment inflowing. Currently 10 species are found. The common species change by season. In spring the pondweed (*Potamogeton foliosus*) is common, while in summer Brittle Naiad (*Najas minor*) is common. White waterlilies (*Nymphaea odorata*) covered 1% of the marsh. Several 100 wild rice (*Zizania aquatica*) also grew.

In Grindstone Marsh's carp excluded areas submergent plants were variably the wetland areas. White Waterlily dominates covering 17%, with 13 plant species present. A small number of wild rice grew in some of the meadow marsh ponds. In Carroll's Bay where carp are not excluded and excess sediment flows in, only two small patches of yellow water lily (*Nuphar variegatum*) remain. In carp protected areas emergent plants substantially increased aided by the low water and dominated by cattails (*Typha*).

Recovery Targets Technical Status (25% of samples meet objectives)

Measure	Location	Objective	1995 Averages	2021 Averages
Vegetated Area	Cootes Paradise	230 ha	26.59 ha	73 ha
	Grindstone Marsh	40 ha	11.26 ha	19 ha
Water Clarity	Cootes Paradise	> 100 cm	< 30 cm	39 cm
	Grindstone Marsh			42 cm
Total Phosphorus	Cootes Paradise	< 30 µg/L	270 µg/L	126 µg/L
	Grindstone Marsh			168 µg/L
Total Suspended Sediment	Cootes Paradise	< 25 mg/L	65 mg/L	28 mg/L
	Grindstone Marsh			43 mg/L
E. coli	Cootes Paradise	< 200 coliforms/100 mL	> 10,000 coliforms/100 mL	203/100 mL
	Grindstone Marsh			164/100 mL
Water Cycle	Cootes Paradise	Natural Pattern	Plan 1958D	Plan 2014 Flooding deviations
	Grindstone Marsh			
Carp Density	Cootes Paradise	< 20 kg/ha	800 kg/ha	5 kg/ha
	Grindstone Marsh			0-150 kg/ha

RAP - A Remedial Action Plan is a coordinated multi stakeholder plan to recover ecosystem function at a highly degraded Great Lakes site. Overall there are 43 Areas of Concern (AOCs) including Hamilton, designated as an AOC in 1987 within the Canada-United States Great Lakes Water Quality Agreement. The agreement recognizes the importance of the Great Lakes to the social, environmental health and economic livelihood of both countries and obligates the three levels of government in Canada to complete the needed actions for recovery. Work on defining the "State of the Harbour Area" was summarized in 1992, and remedial action was initiated. Locally the Bay Area Implementation Team (BAIT), a group of 15 area agencies reviews information and directs the remedial actions in five year work plans. Completion dates for the needed actions are undetermined and the 2015 target year for delisting has past. Measures of status and progress are set for the harbour, Cootes Paradise and Grindstone Marsh as well as the main inflowing streams and sewage control system are also put in context.