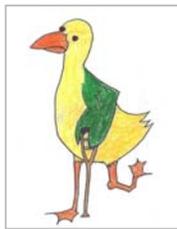


Hamilton Harbour Remedial Action Plan (HH RAP) Beneficial Uses

i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv
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BIRD OR ANIMAL DEFORMITIES OR REPRODUCTION PROBLEMS



STATUS

2002 Status	Impaired	Requires Further Assessment	Not Impaired
2012 Status	Impaired	Requires Further Assessment	Not Impaired

APPROVED BY 2012 RAP STAKEHOLDER FORUM:

- Beneficial Use v status be updated to “requires further assessment”.
- Beneficial Use v delisting objective wording be updated as follows:
Beneficial Use v will be considered not impaired when the types and frequency of deformities and/or reproductive impairments associated with contaminant exposure are similar to those seen at a suitable reference site(s), and do not result in a population level effect as examined through sentinel species (e.g. snapping turtles and herring gulls).

2002 HH RAP Delisting Objective:

When the incidence rates of deformities or reproductive problems in sentinel wildlife species do not exceed background levels in control populations.

Why Update the 2002 Status and HH Wording?

Reasonable: The expectation for HH is to have healthy self sustaining native wildlife populations. Herring gulls and snapping turtles are high on the food web and their health should be indicative of the broader wildlife community.

Achievable: While further assessment of the condition of the sentinel species is required, wildlife deformities and reproductive impairments do not appear obvious at a population level. It is anticipated that remedial actions presently planned for toxic substances and the ongoing Province of Ontario program for municipal and industrial abatement (MISA) will limit exposure to toxics to meet this delisting objective.

Measurable: Environment Canada (EC) has an ongoing monitoring program for contaminants in herring gull eggs. This is an annual program initiated in the 1970s. Periodic monitoring of contaminants, reproduction and deformities in snapping turtles, a supplementary 2-year assessment of reproduction and deformities in Northern Leopard Frogs and a standardized assessment of deformities in Double-crested Cormorant nestlings by EC should provide the additional data necessary for final evaluation of the status.

BACKGROUND INFORMATION

What Was the Original Problem in Hamilton Harbour?

Gross visible deformities such as crossed bills were seen in colonial water-bird at colonies in HH. These were considered to be the result of historical industrial and municipal inputs to the Harbour and airborne contaminants falling within the watershed. Snapping turtles showed reproduction anomalies and high levels of PCBs.

IJC Listing Guideline (1991):

When wildlife survey data confirm the presence of deformities (e.g. cross-bill syndrome) or other reproductive problems (e.g. egg-shell thinning) in sentinel wildlife species.

IJC Delisting Guideline (1991):

When the incidence rates of deformities (e.g. cross-bill syndrome) or reproductive problems (e.g. egg-shell thinning) in sentinel wildlife species do not exceed background levels in inland control population.

Other AOC Comparisons:

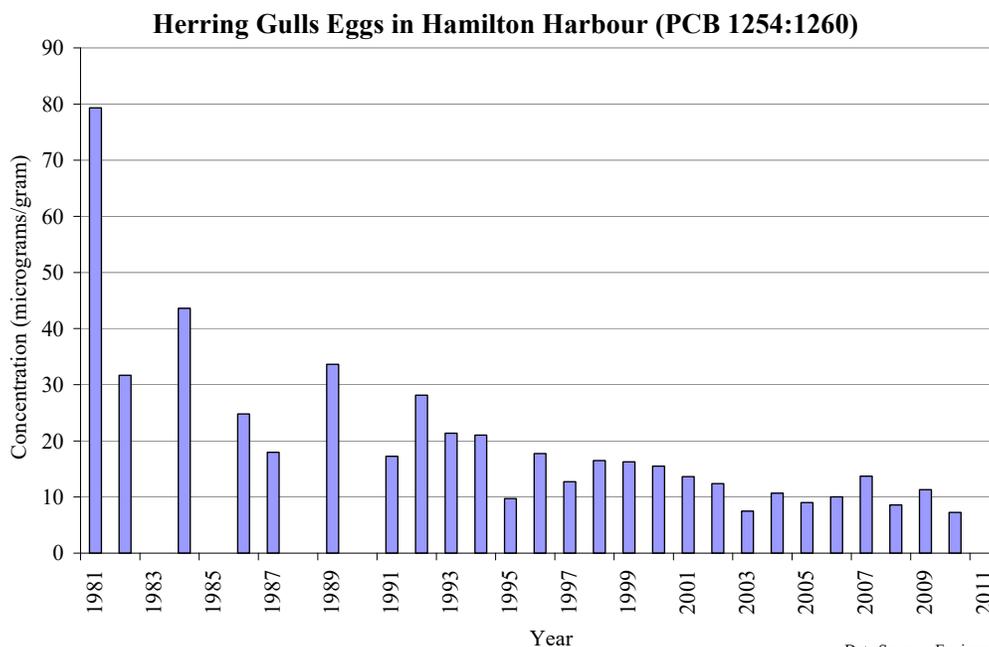
Niagara River AOC lists examples of snapping turtles and herring gulls as sentinel species. Detroit River AOC and Niagara River AOC data are compared to reference sites. Michigan AOCs require a minimum of two successive monitoring cycles.

What Has Been Done?

The Province of Ontario program for municipal and industrial abatement (MISA) is likely the principal factor in the reduction of ongoing contaminants directly to Hamilton Harbour. Similar measures to prevent or diminish air borne contaminants getting into the watershed have been ongoing at an international level.

How Are Things Today?

There has been a 30 year decline in contaminant levels measured in herring gull eggs from Hamilton Harbour (see Figure). While concentrations of certain contaminants found in sentinel species are higher in Hamilton Harbour than some other AOCs, contaminant-induced effects do not appear to be limiting factors at the population level for colonial waterbirds in Hamilton Harbour (Hughes et al. 2010). Nevertheless, hatching success of snapping turtles was the second lowest measured in 14 sites across the lower Great Lakes. While there are no recent reports of gross deformities of colonial waterbirds in the Harbour, standardized surveys for deformities have not been conducted in over 20 years, possibly influencing the likelihood of detecting deformities. Planned surveys for deformities in cormorants and studies of reproduction and deformities in turtles and frogs in 2012/13 should clarify the situation.



What Still Needs To Happen?

- There is a need to develop and confirm reference sites for comparison to Hamilton Harbour, preferably within Lake Ontario.
- Ongoing studies by EC to measure contaminants and assess endpoints of reproduction and deformities in sentinel species need to continue to provide essential information for final assessment of BUI status.
- Remedial Actions for Randle Reef and the ArcelorMittal Dofasco Boat Slip need to be completed.
- PCB source track-down needs to continue in the Windermere Arm of the Harbour

When Will The Status Change?

- This will be determined when further assessment of this BUI is carried out.

Where Can I Learn More?

Hughes, KD et al. 2010. Current Status and Trends of Aquatic Wildlife in the Hamilton Harbour Area of Concern

HHRAP. 2003. Remedial Action Plan for Hamilton Harbour. Stage 2 Update 2002.

BARC. 2004. Toward Safe Harbours: Progress Toward Delisting – Fish and Wildlife

HHRAP. 1992. Remedial Action Plan for Hamilton Harbour. Goals, Options and Recommendations: RAP Stage 2.

Most references can be provided by the HH RAP Office as a PDF upon request