

IV.7 Research and Monitoring Component

A strength of the Hamilton Harbour RAP is the significant research capability of the local community; this has meant that most implementation actions stand on a firm scientific basis. The organizations involved include the Federal Agencies (Environment Canada and Fisheries and Oceans Canada) housed at the Canada Centre for Inland Waters (CCIW), the Ontario Ministry of Environment (OMOE), university research (principally through McMaster University), and ongoing monitoring by the Royal Botanical Gardens (RBG), local conservation authorities, and municipalities. Scientific research into emerging issues will continually help to direct future implementation actions.

In 2001, the RAP Technical Team hosted the first annual Hamilton Harbour Research and Monitoring Workshop. It provides scientists and resource managers with the opportunity to share ideas and information relating to the Harbour. The RBG has been holding annual field season reviews since 1993 on their work with Project Paradise in Cootes Paradise Marsh and lower Grindstone Creek Estuary.

The reporting of Harbour conditions to the public has the potential to be enhanced through the development of a single website with links to the Bay Area Implementation Team (BAIT) partners. This endeavour is underway between the Bay Area Restoration Council (BARC) and the RAP Office. The periodic “Toward Safe Harbours” report produced by BARC used a report card format in 2002 to better disseminate information to the public about the progress made towards delisting Hamilton Harbour as an AOC.

The corporate scientific memory of the Hamilton Harbour RAP may be affected as a number of individuals that have made contributions to the understanding of the Harbour environment reach retirement age. This issue is easily overlooked, but long term planning to replace these individuals will be important to the continued success of the Hamilton Harbour RAP.

Emerging issues in research and monitoring include:

- updating (1996-2000) loadings estimates of contaminants entering the Harbour,
- determining sites of any additional highly contaminated sediment within the Harbour,
- determining contaminant trends in the benthos and fish community,
- insecure funding for long term trend monitoring, and
- the loss of corporate research memory due to upcoming retirements.

IV.7.1 Monitoring of Fish and Wildlife Improvements

Recommendation No. RM – 1

(1992 Rec. 15)

That the status of the Harbour and Cootes Paradise fish and wildlife community and habitat improvements continue to be monitored.

Responsible Agencies

OMNR, DFO, RBG, EC - CWS, Hamilton Conservation Authority, Hamilton Naturalists' Club, McMaster and other Universities

Short Term Target

RM – 1.1 (2005) Develop wildlife targets in addition to colonial nesting birds.

Ongoing Target

RM – 1.2 Refer to Chapter VIII of the RAP Stage 2 Update Report and to the monitoring program chart from the Fish and Wildlife Habitat Restoration Project Yearly Report.

Status

Many of the monitoring activities examining the status of the fish and wildlife community and habitat improvements in Hamilton Harbour and the Cootes Paradise Marsh are presented throughout the Fish and Wildlife Component of this chapter (Section 4).

Targets were set in the delisting objectives for populations of the six colonial nesting birds species found in Hamilton Harbour: Caspian terns, common terns, herring gulls, black-crowned night herons, double-crested cormorants, and ring-billed gulls. The Canadian Wildlife Service (CWS) surveys the number of nests for each species annually, indicating the number of pairs of birds in the area. These data are presented in Figures 53 – 58. The CWS does survey the double-crested cormorant in Hamilton Harbour; however, it is the OMNR that is responsible for the management of cormorants.

Through the Marsh Monitoring Program, staff at the RBG keep data on various wildlife species utilizing the Cootes Paradise Marsh and the Hendrie Valley/Grindstone Creek area. During the 2001 field season a common musk turtle was discovered. This herpetile was last recorded in Cootes Paradise in 1965 and was thought to have been fished out by anglers. Detailed information about all of the work on Project Paradise, including the Marsh Monitoring Program can be found in the annual serial, "Project Paradise: Field Season Review" published by the RBG.

Figure 59 shows data provided by the RBG on the number of calling amphibians in Cootes Paradise from 1995 – 2001. "Since the Fishway became operational in 1997, numbers have almost doubled which is an indication that work is going well... On a diversity basis, numbers are good but species populations could be better." (pg. 33, RBG 2001 Field Season). Snapping turtle populations are monitored by the RBG. The effect of traffic along Cootes Drive on mortality rates of turtles is of current interest (71 Snapping turtles in 1999). Pilot projects to create alternate turtle nesting habitat away from traffic was started in 2001 with monitoring to begin in



2002. Herpetiles in the Grindstone Creek Estuary include red-spotted newt and spotted salamander, with muskrats and beavers being the mammals reported in the area by the RBG.

The RBG has been tracking the number of fall migratory waterbirds that utilize Cootes Paradise Marsh, and the Hendrie Valley/Grindstone Creek area since 1990, and added two stations in 2001 encompassing portions of the western harbour. The data for 2001, which were the highest counts since the Cootes Paradise Fishway became operational, are presented in Figure 60. In contrast to the record number of waterbirds, the 2001 season average for breeding marsh bird pairs in Cootes Paradise (Figure 61) unexpectedly declined.

Due to the difficulty of collecting meaningful census data for other wildlife species (e.g. deer, woodchucks, mink, muskrats, hawks, etc.) researchers are reviewing the goal of short term target RM – 1.1. The continued development and improvement of habitat for wildlife species through the work of the Fish and Wildlife Habitat Restoration Project may prove to be a more effective measurement in the RAP process.

Figure 53. Caspian tern Nests Within Hamilton Harbour

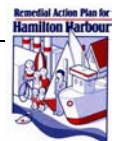
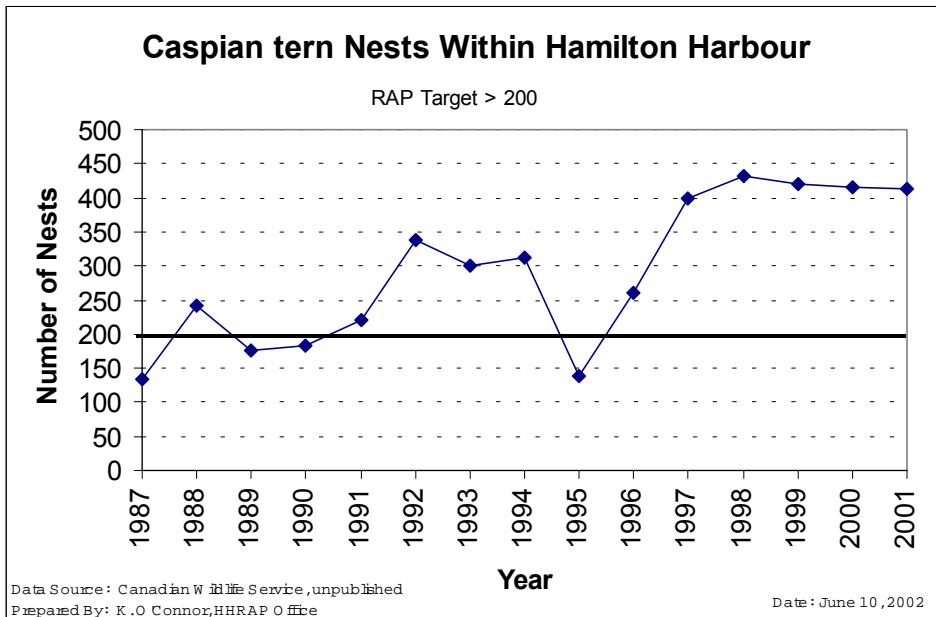


Figure 54. Common tern Nests Within Hamilton Harbour

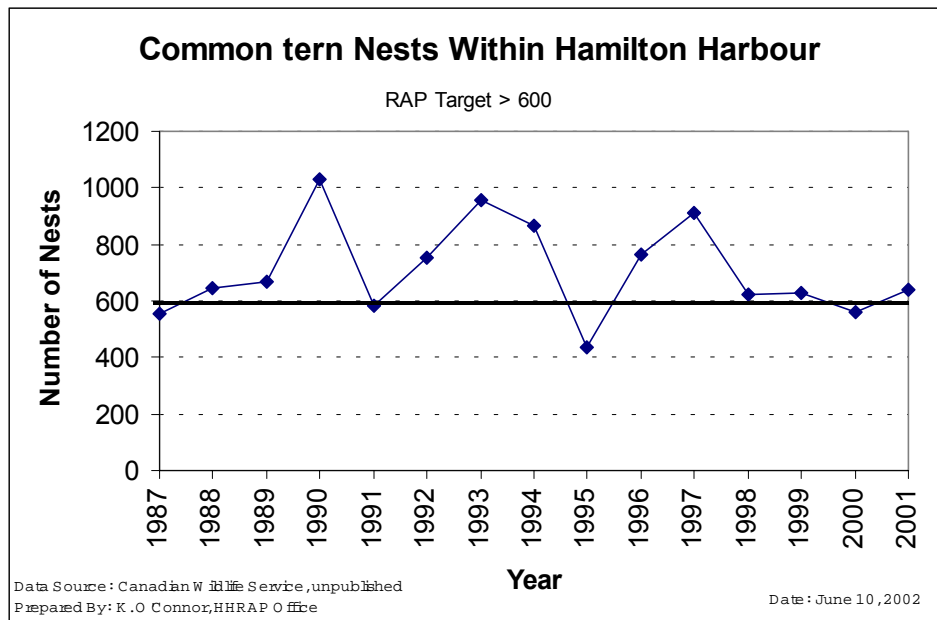


Figure 55. Herring gull Nests Within Hamilton Harbour

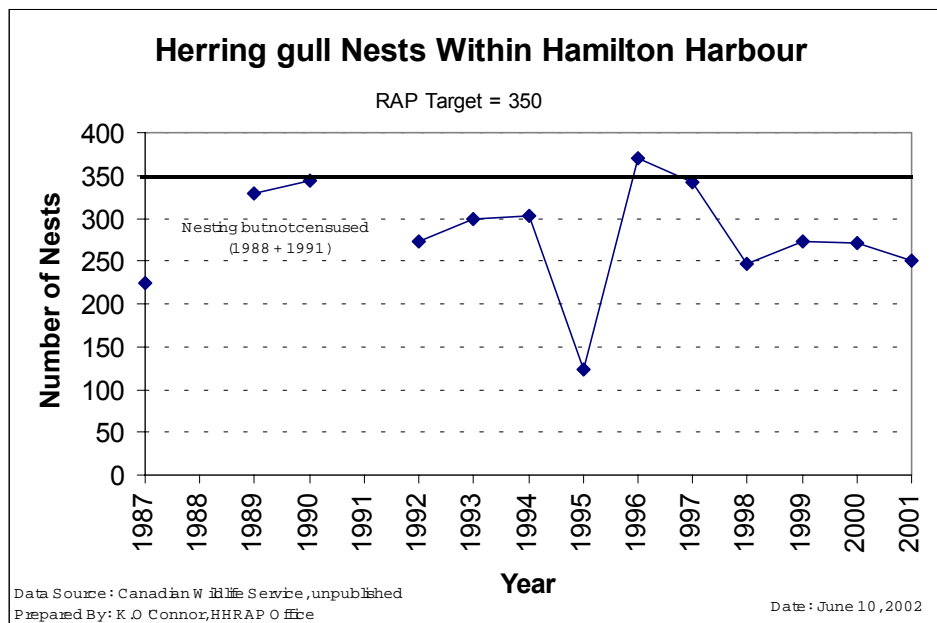


Figure 56. Black-crowned night heron Nests Within Hamilton Harbour

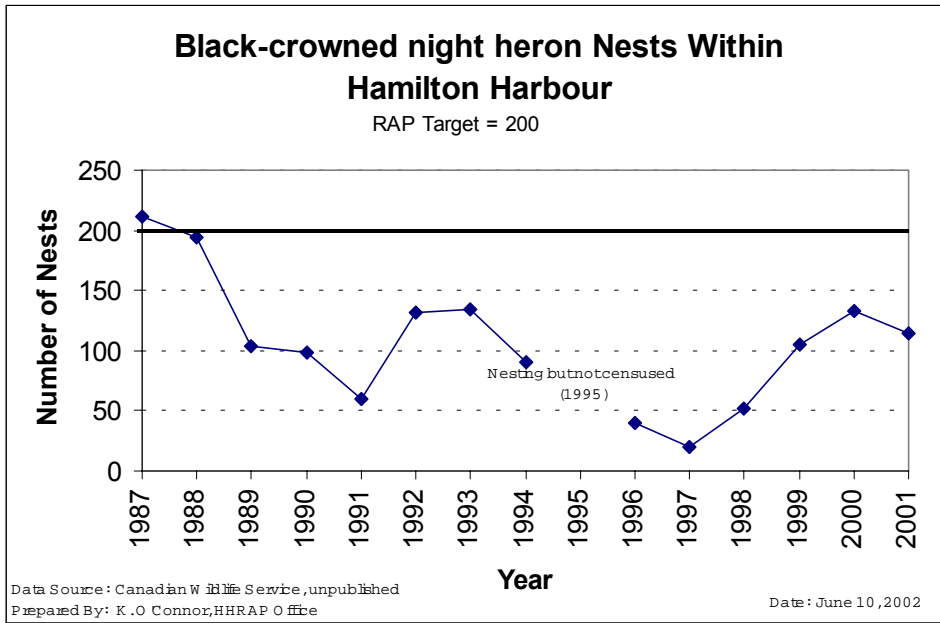


Figure 57. Double-crested cormorant Nests Within Hamilton Harbour

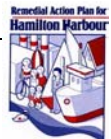
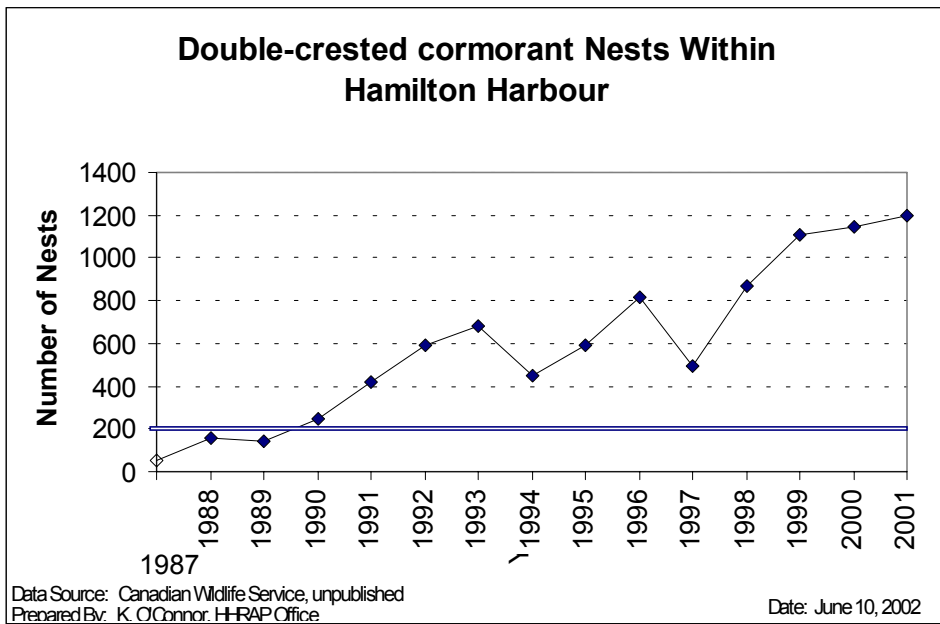


Figure 58. Ring-billed gull Nests Within Hamilton Harbour

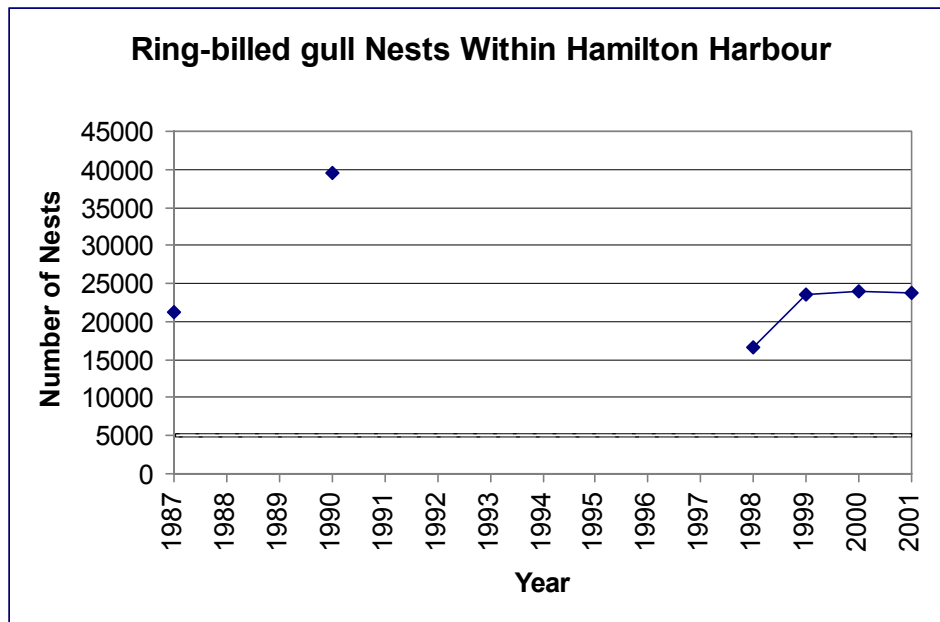


Figure 59. Calling Amphibians in Cootes Paradise Marsh

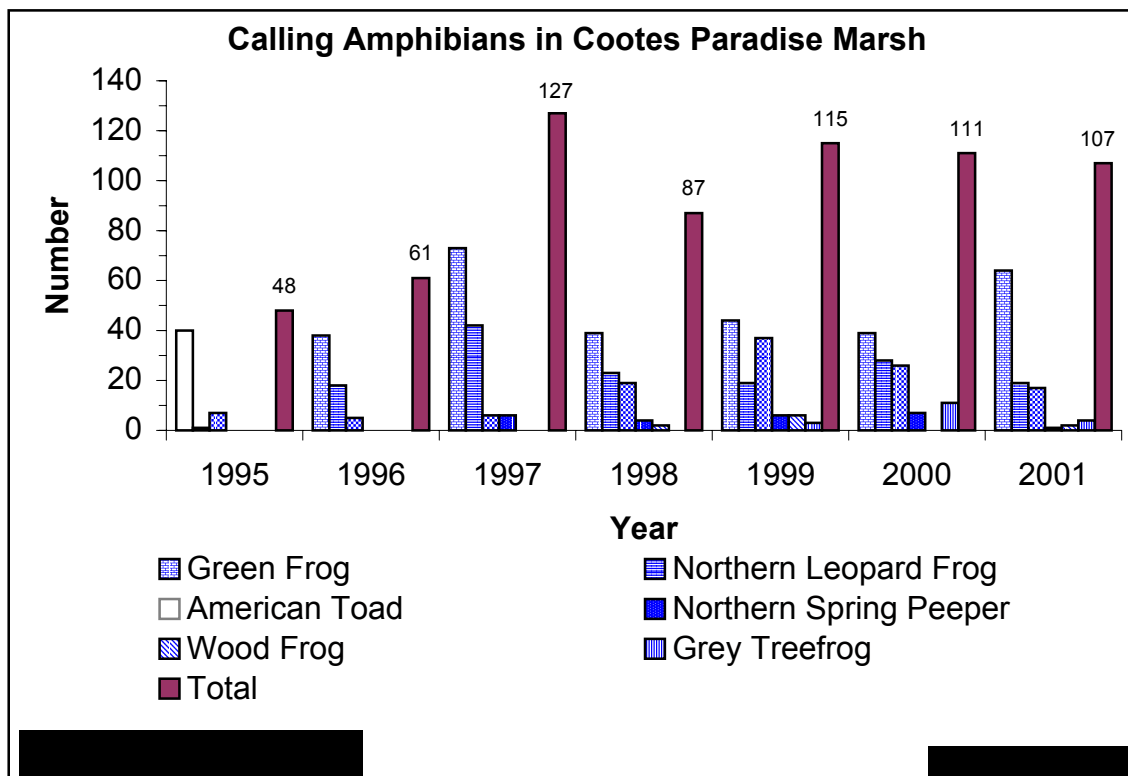


Figure 60. Fall Migratory Waterbirds – 2001

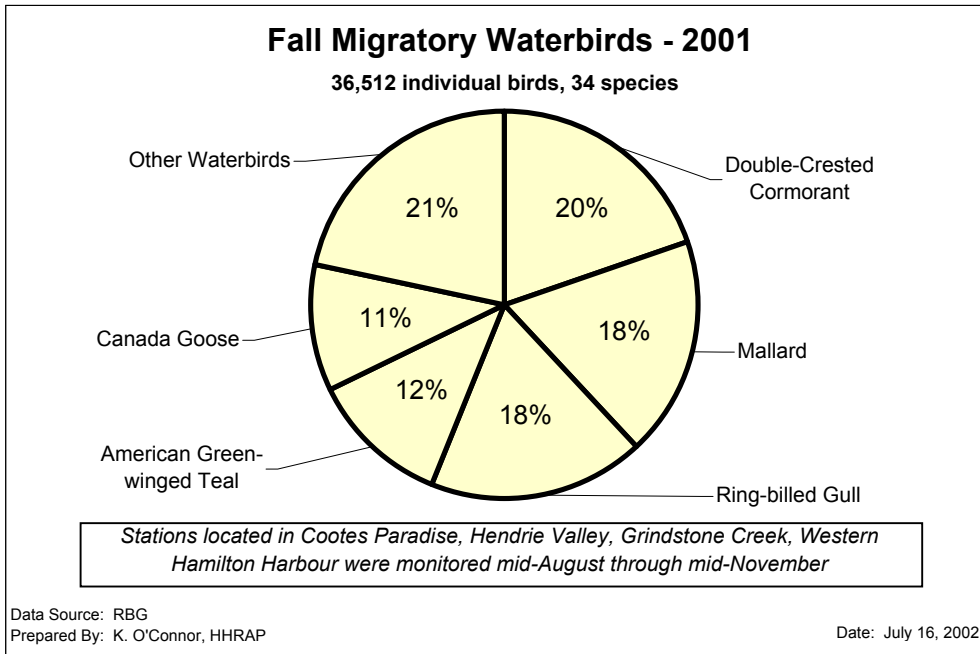
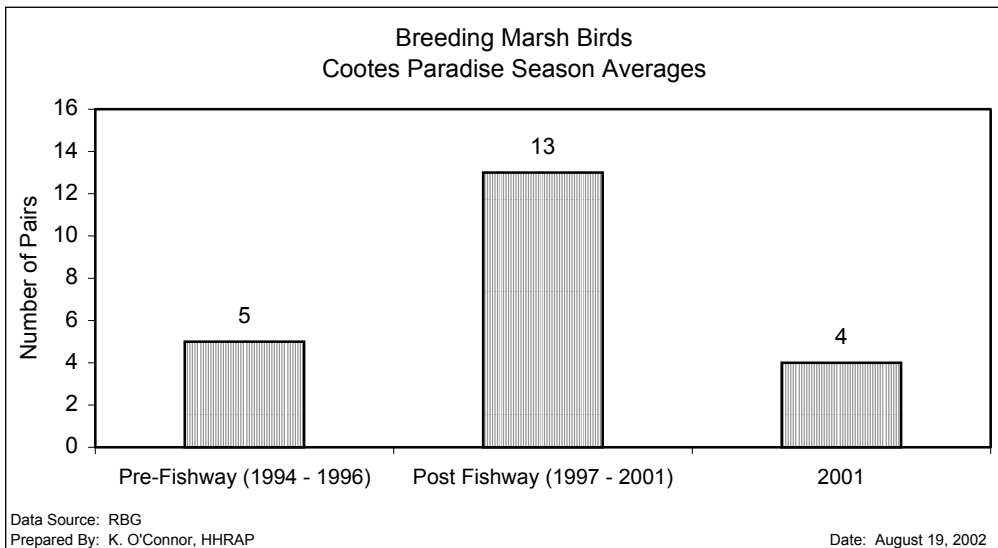


Figure 61. Breeding Marsh Birds in Cootes Paradise



IV.7.2 Fish and Wildlife Indicator Species

Recommendation No. RM – 2

(1992 Rec. 17)

That indicator species for both fish and wildlife populations, which are indicative of conditions within the Harbour, be identified to monitor temporal (& spatial) trends in contaminant levels, indicate the efficacy of remedial activities and provide data related to the development of fish consumption guidelines.

Responsible Agencies

EC - CWS, OMNR, DFO, OMOE, RBG, McMaster University, other universities

Short Term Target

RM – 2.1 (2005) Implement a trend monitoring program for indicator species for birds, amphibians, reptiles, fish, and invertebrates.

Long Term Targets

RM – 2.2 (2015) Continue trend monitoring program.

RM – 2.3 (2015) There should be no restrictions on consumption of fish and wildlife from the Harbour attributable to local sources.

RM – 2.4 (2015) Survey results should confirm no tainting of fish and wildlife flavour.

Status

Indicator species are used to examine conditions within the Harbour while monitoring long term temporal and spatial trends in contaminant levels. Recommended fish and wildlife population indicator species include: herring gull, snapping turtle, channel catfish, and white perch.

The herring gull egg contaminants monitoring program by Environment Canada's Canadian Wildlife Service (CWS) has been ongoing annually since 1980 in Hamilton Harbour and at other selected sites around the Great Lakes (Figures 62 - 65). CWS has used these data to monitor spatial and temporal trends in contaminant levels and to develop relationships between contaminant levels and adverse health effects.

DNA germ-line mutation rates (specifically minisatellite DNA mutation rates) continue to be studied in gulls in Hamilton Harbour by researchers at McMaster University. In a comparison to herring gull chicks in rural Great Lakes sites and the Bay of Fundy, the Hamilton Harbour chicks inherited minisatellite mutations almost twice as often (Yauk and Quinn 1996). In a further comparison examining proximity of colonies to cities with active steel mills, the germline minisatellite mutations again were highest in industrialized colonies containing steel mills and showed a correlation with colony distance that suggests emissions from steel production play a prominent role in the mutations (Yauk *et al.* 2000). For more information see the "Research and Monitoring Report: 2001 Season" (pp. 93-104).

The monitoring of the size and reproductive success of breeding populations of colonial waterbirds in the Harbour will be continued/instituted on at least a biennial basis by CWS.

Physiological impacts of contaminants on colonial waterbirds will be maintained on a research and opportunistic basis.

CWS has confirmed high levels of organochlorines in snapping turtles from Cootes Paradise and has also reported the occurrence of teratogenic abnormalities in developing turtles. Results comparing multiple sites indicated that snapping turtles from Cootes Paradise were the most contaminated. Monitoring of contaminant levels in snapping turtle eggs and deformity rates in hatchling turtles from the Harbour will be instituted on a biennial basis starting in 2002.

The feasibility of a health effects program is being investigated for birds and reptiles by CWS.

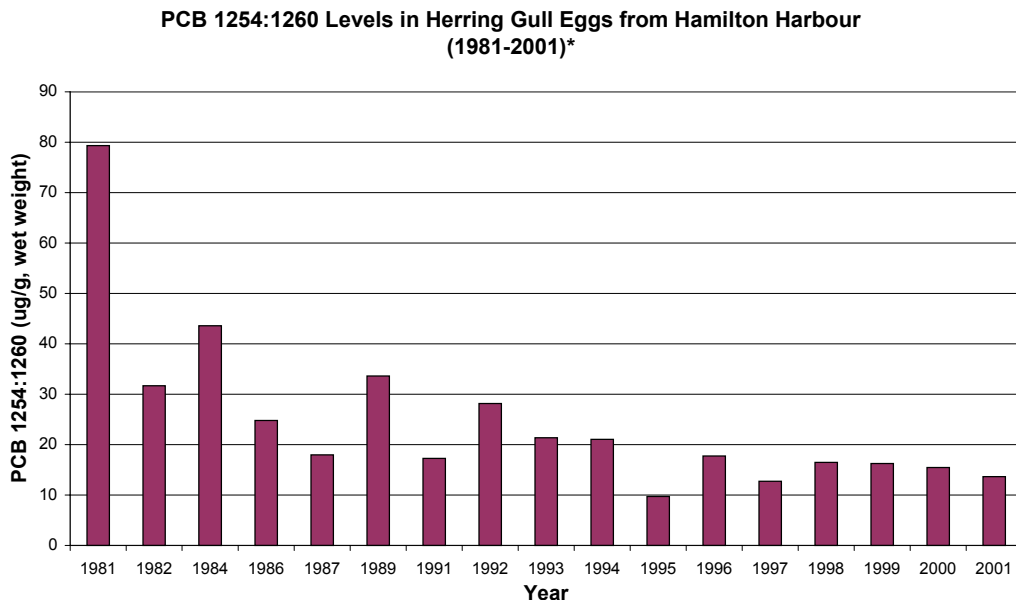
DFO has been funded to develop a whole fish contaminant monitoring program (Contaminant Trend Monitoring Study of Harbour Fish Community) in Hamilton Harbour using fish species that are resident in the Harbour and Cootes Paradise. The program will be used to determine if contaminant levels are changing over time in Hamilton Harbour.

The "2001-2002 Guide to Eating Ontario Sport Fish" lists consumption advice for eleven species of sport fish in Hamilton Harbour. Yellow perch, white perch, white bass, black crappie, brown bullhead, white sucker, rainbow smelt have restrictions for: mercury, other metals, PCBs, mirex/photomirex, pesticides, chlorinated phenols, and chlorinated benzenes. Brown trout, channel catfish, freshwater drum, and carp have restrictions for all of the above contaminants as well as dioxins and furans. Restrictions range from limiting consumption to eight meals/month (some sizes of yellow perch) down to a do not eat advisory (some sizes of channel catfish). The consumption advisory for women of childbearing age and children under 15 are even more restrictive. A comparison of Hamilton Harbour restrictions to other Lake Ontario sites will need to be done to see how many of the restrictions are local versus regional. The distribution of this information in a language appropriate format is a constant challenge with the increasing immigrant population using the Harbour as a source of food. OMOE continues to monitor contaminant related restrictions on fish consumption in Hamilton Harbour. The DFO and RBG will continue to provide fish for OMOE to analyze and include in their fish consumption guide.

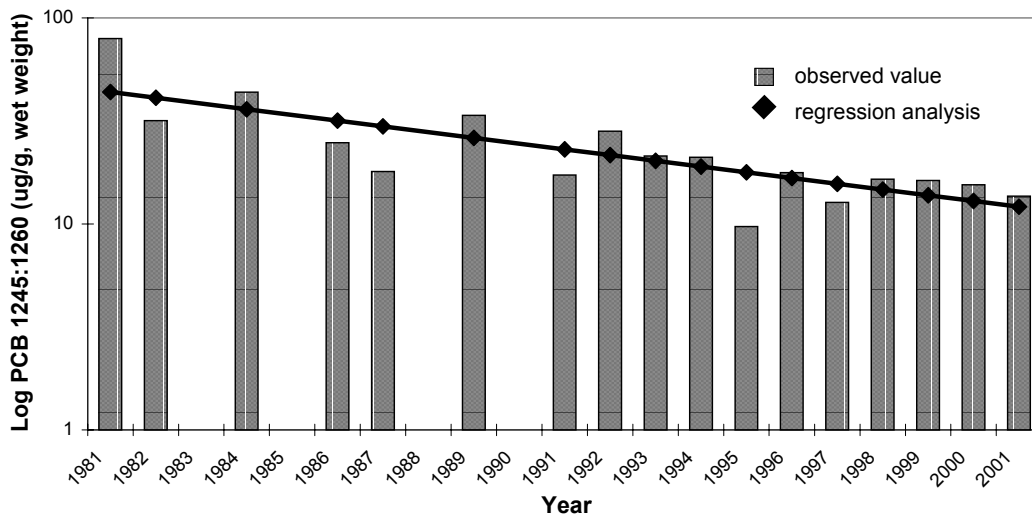
Health Canada funded a study that examined sport fish consumption in Great Lakes Areas of Concern (1995-1997). People fishing around the Hamilton Harbour shoreline were interviewed to determine whether they ate the fish they caught and what species were being eaten.

DFO proposes to submit fish to the Fish Inspection Agency for odour and taste studies in 2003 to determine if there is any tainting of fish from Hamilton Harbour.

Figure 62. PCB Levels in Herring gull Eggs from Hamilton Harbour



Change-Point Regression Analysis of PCB 1254:1260 Levels in Herring Gull eggs from Hamilton Harbour (1981-2001)



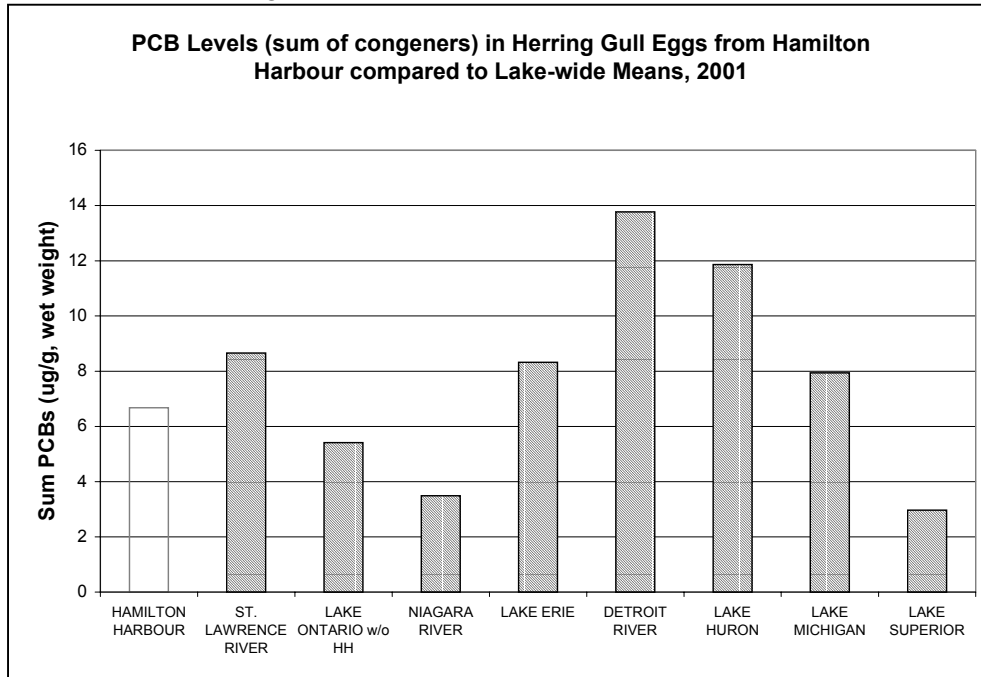
Analysis shows a constant rate of decline throughout the study. Chemical concentrations must be plotted on a log scale for the proper visual interpretation of the rate of change (trend).

Source: Canadian Wildlife Service, unpublished

Date: May 2002



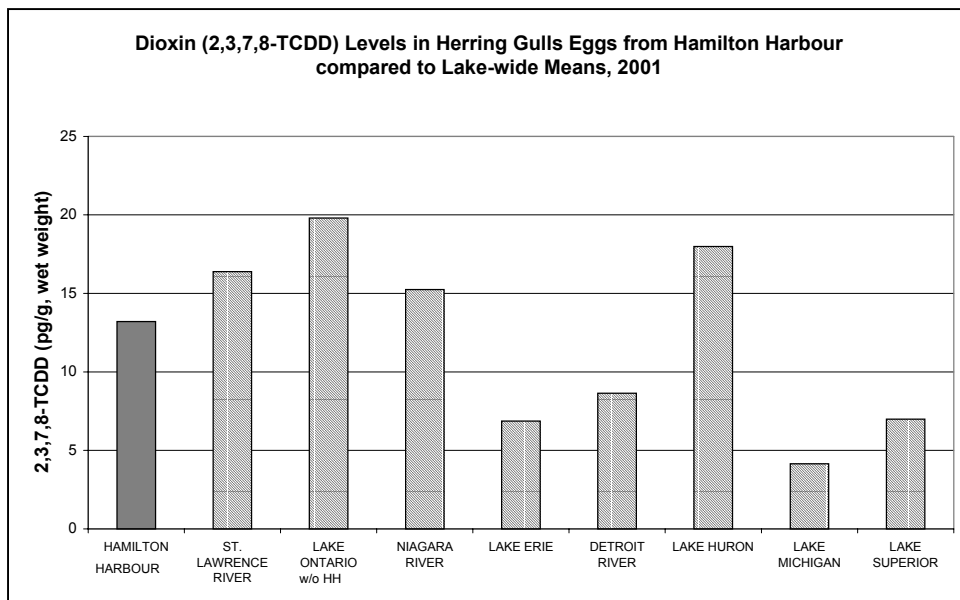
Figure 63. PCB Levels in Herring gull Eggs from Hamilton Harbour Compared to Lake-wide Averages in 2001



Source: Canadian Wildlife Service, unpublished

Date: May 2002

Figure 64. Dioxin Levels in Herring gull Eggs from Hamilton Harbour Compared to Lake-wide Averages in 2001



Source: Canadian Wildlife Service, unpublished

Date: May 2002

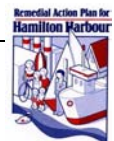
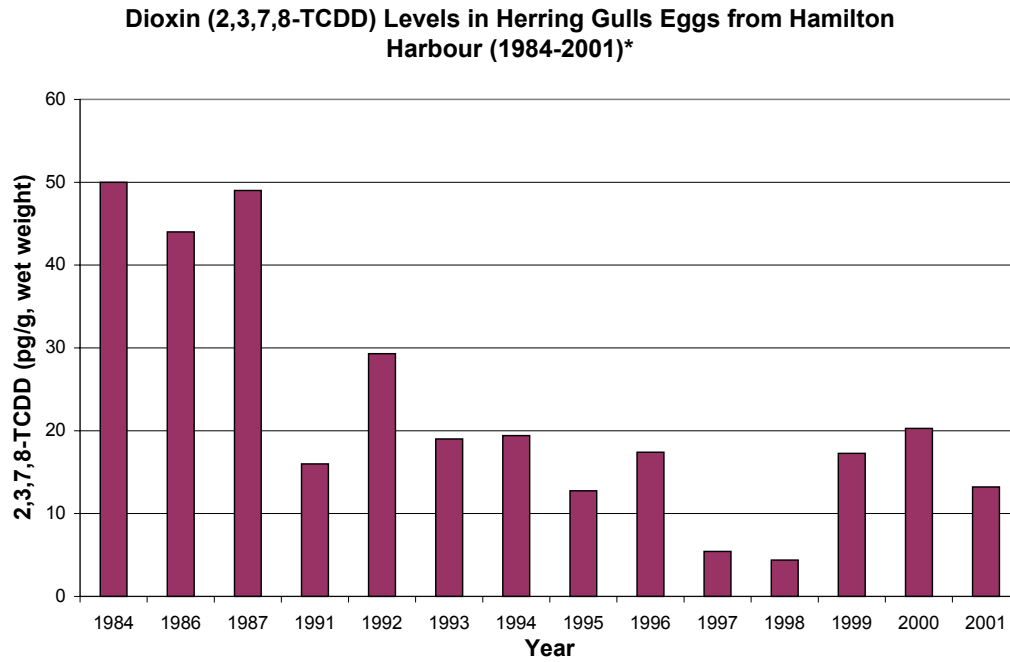
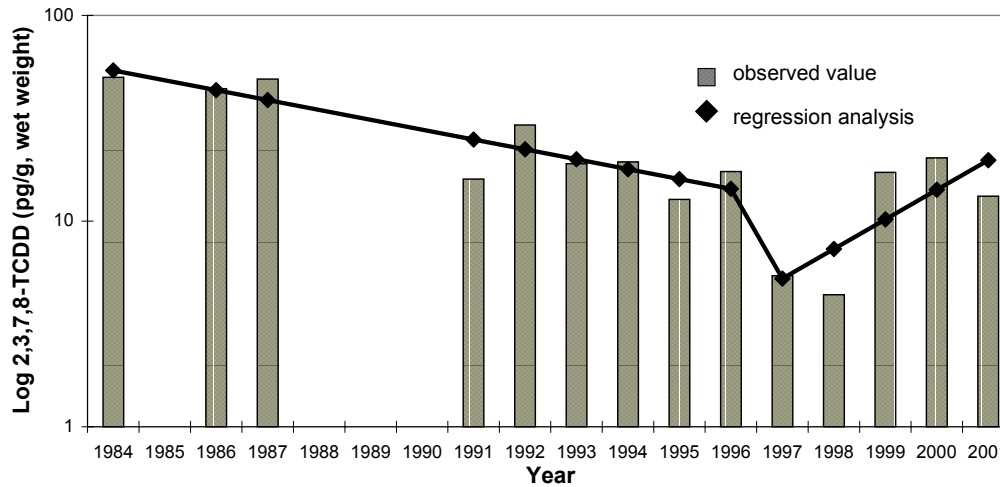


Figure 65. Dioxin Levels in Herring gull Eggs from Hamilton Harbour



Change-Point Regression Analysis of Dioxin (2,3,7,8-TCDD) Levels in Herring Gull eggs from Hamilton Harbour (1984-2001)



Analysis shows significant trends before and after the change point in 1997. Chemical concentrations must be plotted on a log scale for the proper visual interpretation of the rate of change (trend).

Source: Canadian Wildlife Service, unpublished

Date: May 2002



IV.7.3 Bacteria Monitoring at Beaches

Recommendation No. RM – 3

(1992 Rec. 27)

That the status of bacteria quality be monitored by conducting regular sampling for bacteria in candidate swimming areas of the Harbour.

Responsible Agencies

City of Hamilton

Short Term Targets

- RM – 3.1 **(2005)** Research should be continued to understand why the current beaches (Bayfront Park and Pier 4 Park) are closed during periods of the swimming season.
- RM – 3.2 **(2005)** Identify the causes for beach closures

Long Term Target

- RM – 3.3 **(2015)** Reduce beach closures in Bayfront Park and Pier 4 Park by remediation

Status

The Bayfront Park and Pier 4 Park are beach properties in Hamilton Harbour where public swimming is now available, when bacterial testing deems them safe. The City of Hamilton Public Health Department is responsible for determining compliance for E. Coli levels at the two beach areas. Provincial protocol requires that routine sampling be done at five sample sites per beach area once a week, unless there is a posting at which time the frequency increases. Data from the Public Health Department on the number of swimming days and percentage of beach openings during the swimming season at Bayfront Park and Pier 4 Park are shown in Figures 66 and 67 respectively. Bacteria levels caused Bayfront Park Beach to be closed for 70 days out of 106 in 2001 and the Pier 4 Park Beach to be closed for 47 days out of 103 in 2001.

Toronto's Eastern Beaches have found that during the June-August swimming season it is possible to achieve a target of being open 95 % of the time. The water currents are different in Hamilton so this may not be possible here, but this is certainly encouraging and something to strive for.

An investigation by Environment Canada scientists at CCIW into the source of high bacteria levels causing beach closures at the Pier 4 and Bayfront Park beaches was started in 2001. It is commonly assumed that the bacteria that cause the beach closings are coming from harbour water into the beaches. That assumption was tested using measurements in transects from the beaches out into the harbour. Samples show (Figure 68) that E. Coli numbers are highest right off shore, suggesting that the bacteria are coming from the beach itself. The E. Coli test used is not specific to human sources, so other sources such as birds, dogs, or other wildlife cannot yet be ruled out.

A draft summary report put out in December 1995, "Risk Assessment from Dermal Exposure to PAH in Sediments" looked at three AOCs, including Hamilton Harbour. Concerns regarding the risk of exposure in the beaches area of the Harbour were raised, along with some suggestions for potential actions. The report was finalized in a 1998 article in the Archives of Environmental Contamination and Toxicology (Hussain et al 1998).

Halton Region currently doesn't designate or monitor any swimming areas in Hamilton Harbour.

Figure 66. Swimming Days and Percent Beach Openings at Bayfront Park

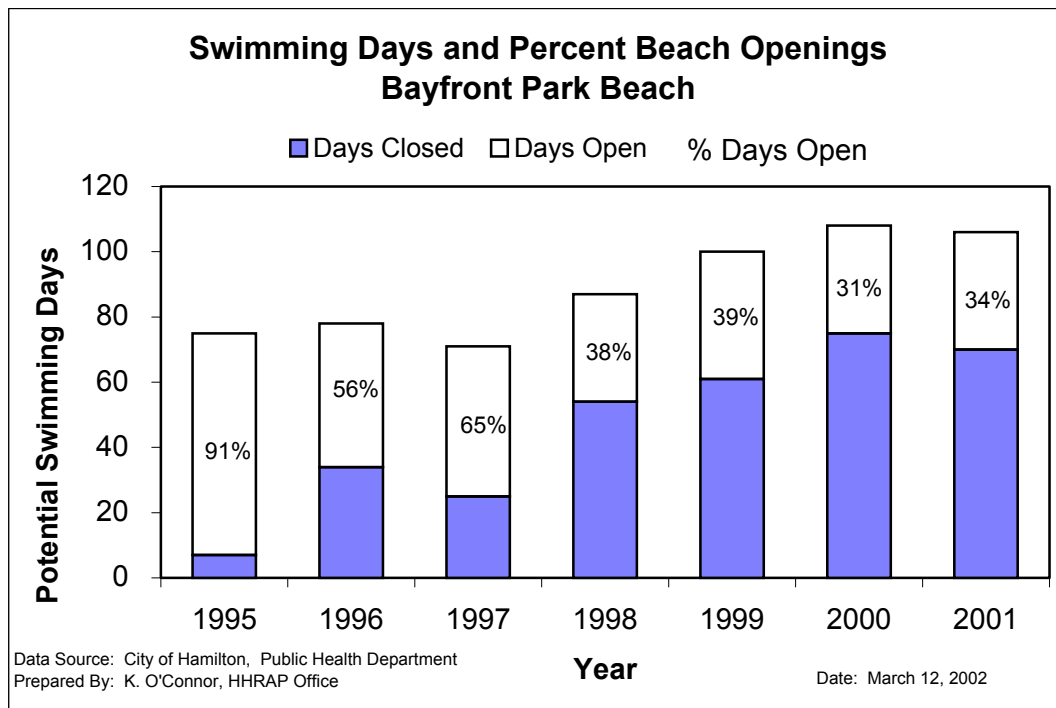


Figure 67. Swimming Days and Percent Beach Openings at Pier 4 Park

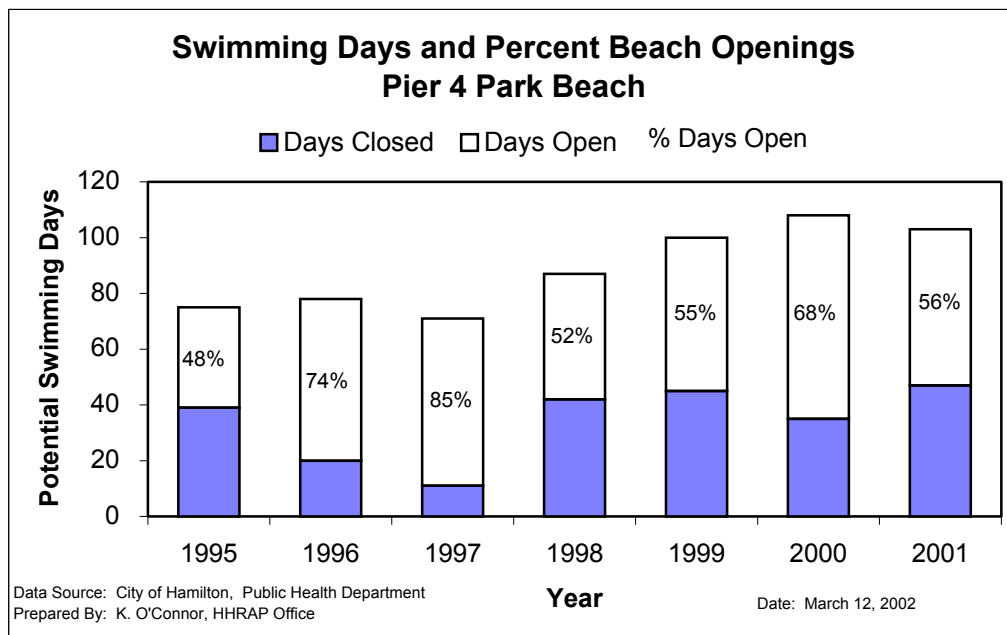
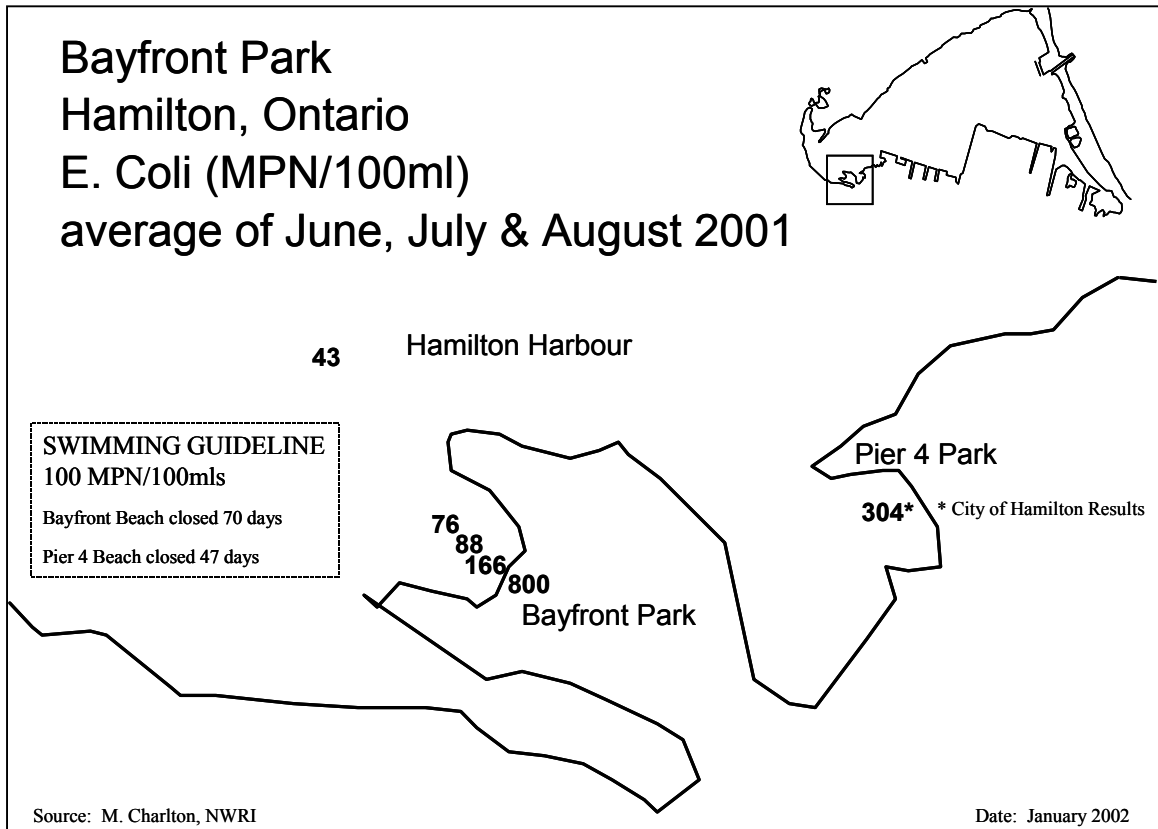


Figure 68. Average Sample Levels of E. Coli Around Hamilton Harbour Beaches in 2001



IV.7.4 Creek Water Quality Monitoring

Recommendation No. RM – 4

(2001 Rec. T)

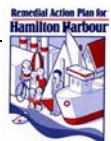
Enhance the collection of water quality monitoring information for creeks within the watershed using surveillance monitoring, performance monitoring, and special studies.

Responsible Agencies

OMOE, Conservation Halton, Hamilton Conservation Authority, City of Hamilton, City of Burlington, Regional Municipality of Halton

Short Term Targets

RM – 4.1 (2003) Surveillance Monitoring: Maintain a minimum of six sampling sites on the Grindstone, Spencer and Red Hill Creeks (to total a minimum of two per creek) as part of the Provincial Water Quality Monitoring Network to improve the ability to determine long term water quality trends.



- RM – 4.2 (2003) Performance Monitoring: Undertake specific performance monitoring when needed to evaluate the effectiveness of stewardship programs, pollution source identification, etc.
- RM – 4.3 (2003) Performance Monitoring: Periodically undertake special studies:
- To estimate concentrations and loadings for phosphorous and suspended solids when deemed necessary
 - CSO improvements
 - Storm Event Monitoring
 - Bioassay of Watershed
 - Source identification in urban creeks
 - Source identification in rural creeks

Status

Various water quality monitoring activities are now taking place by different agencies throughout the watershed (see Chapter VIII for more details). The two conservation authorities use the Provincial Water Quality Monitoring Network for creek monitoring and this is helping to improve previous coordination concerns. City of Hamilton and OMOE have undertaken water quality monitoring of Red Hill Creek. The City of Hamilton is examining new partnerships to expand the coordination of efforts. Some work has also been done by the student based Watershed Action Towards Environmental Responsibility (WATER) Stream Stewards on several area creeks, including Red Hill Creek. The City of Hamilton is undergoing a Combined Sewer Overflow (CSO) review to meet Provincial F-5-5 requirements (see Rec. WQ – 1c).

IV.7.5 Cumulative Effects of Municipal Discharges into Lake Ontario

Recommendation No. RM – 5

(1992 Rec. 41)

It is recommended that studies to help predict the cumulative effects of the discharges from the City of Hamilton and Regional Municipality of Halton WWTPs to Western Lake Ontario, be conducted collaboratively by the City of Hamilton, Regional Municipality of Halton, the Ontario Ministry of the Environment, and Environment Canada, and their initial results reported to the RAP including direct WWTP discharges, the Harbour discharge itself, to evaluate future infrastructure effects.

Responsible Agencies

City of Hamilton, Regional Municipality of Halton, OMOE, EC

Short Term Target

- RM – 5.1 (2005) To study and predict cumulative effects of the discharges from the municipalities into Western Lake Ontario and report the initial results to the RAP.

Status

Studies regarding municipal discharge have been undertaken at the Canada Centre for Inland Waters (CCIW) in Burlington for some time. Past studies have also related to discharges from Hamilton Harbour into Lake Ontario. Research is in progress by Environment Canada to study where Hamilton Harbour flows go in Lake Ontario once they leave the Burlington Ship Canal.



The examination of flows within the canal has yielded a complicated picture. OMOE continues to conduct various surveys, including Lake Ontario tributary toxics monitoring at Red Hill Creek, harbour water and sediment quality screening, and nearshore mapping and biomonitoring in the Hamilton Harbour area.

From an environmental standpoint, research is needed in this area to aid in discussions on sustainability. If final water quality loading targets for the WWTPs cannot be reached and maintained it would require investigations into moving municipal discharges directly into Lake Ontario, the topic of Recommendation WQ – 4.

A study of the ability of Western Lake Ontario to handle treated sewage completed by NWRI has recently been released (Miners et al 2002).

IV.7.6 BAIT and BARC Reports

Recommendation No. RM – 6

(1992 Rec. 45)

That the Bay Area Implementation Team (BAIT), responsible for carrying out and auditing the Remedial Action Plan, report on the schedule of implementation for the RAP recommendations and their associated targets.

That the Bay Area Restoration Council (BARC), responsible to promote, monitor and assess the Remedial Action Plan, report to the public on the progress of the RAP in Hamilton Harbour with input from Harbour Stakeholders.

Responsible Agencies

BAIT, BARC

Ongoing Targets

- RM – 6.1 That BAIT maintain the “Implementation Actions” report at least every five years.
- RM – 6.2 That BARC continue to produce the “Toward Safe Harbours” report

Status

The Bay Area Implementation Team (BAIT) report “Implementation Actions” is an internal working document created in 2001 for use by its own members. It sets out the actions taken and planned by the individual agencies to implement the RAP. The intention of the report is to assist implementers in fulfilling their roles during planning and budgetary discussions in order to keep RAP issues and commitments front and centre. As a working document, it will be constantly updated to keep an accurate record of actions.

As part of the Bay Area Restoration Council’s (BARC) responsibility to promote, monitor, and assess the RAP, the group has produced a “Toward Safe Harbours” report annually since 1994. The 2002 version was developed in a report card format to enhance public understanding of the Hamilton Harbour RAP issues and progress towards delisting as an AOC.

IV.7.7 Surveillance and Monitoring

Recommendation No. RM – 7

(1992 Rec. 46)

That all agencies, municipalities and industries continue their commitment and enhance where necessary the collection of the surveillance and monitoring data and analyses required for local decision making and ultimately presentation to the public and the International Joint Commission.

Responsible Agencies

All agencies identified in the monitoring plan (Stage 2 Update, Chapter VIII)

Ongoing Targets

- RM – 7.1 All agencies and governments identified in the monitoring plan (Stage 2 Update, Chapter VIII) carry out their portion of the surveillance and monitoring.
- RM – 7.2 Hold a workshop with proceedings on an annual basis, which summarizes the monitoring and research work going on in the Hamilton Harbour Watershed.

Status

A comprehensive surveillance and monitoring program is important to determine the impact of implementation actions and progress towards delisting. Chapter VIII in this report deals with surveillance and monitoring in detail. It is a revision of Appendix I from the 1992 Stage 2 Report. Information about current surveillance and monitoring programs collected in 2001 by the Research and Monitoring Task Group was used as the basis for this revision.

The RAP Technical Team has hosted the Hamilton Harbour Research and Monitoring Workshop annually since 2001. The information presented focuses on current field season research and monitoring on the Harbour itself. The RBG has been holding a Project Paradise Field Season Review annually since the end of the 1993 Field Season. The information presented focuses on work in Cootes Paradise Marsh and the Grindstone Creek Estuary areas. A third workshop could be added to the series to encapsulate Harbour Watershed monitoring activities.

IV.7.8 Research Support Addressing Harbour Problems

Recommendation No. RM – 8

(1992 Rec. 47)

That the management agencies (e.g., Federal and Provincial Governments, Municipalities, Conservation Authorities, RBG) responsible for research and development provide research support addressing the specific problems of the Harbour and its watershed.

Responsible Agencies

All agencies

Ongoing Target

RM – 8.1 To periodically review research and study requirements that will impact most immediately on the major financial decisions to be made in implementing the plan (or implementing changes to the plan).

Status

After the Hamilton Harbour Research and Monitoring Workshop each presenter provides an abstract of their talk. All the information, including a meeting summary encapsulating discussions, is compiled into a report available to participants. This report will be used on an ongoing basis to identify further research needs.

IV.7.9 Funding for Technological Development**Recommendation No. RM – 9**

(1992 Rec. 48)

In order to reduce implementation costs and ensure effectiveness in achieving a reduction in loadings of toxic substances to the Harbour, that sediment, sewage sludge, and wastewater treatment technology development be funded at an adequate level to improve remedial measures.

Responsible Agencies

City of Hamilton, Regional Municipality of Halton, EC, OMOE

Short Term Target

RM – 9.1 **(2000-2005)** Continue to access the Great Lakes Sustainability Fund (GLSF) to achieve reductions in loadings.

Long Term Target

RM – 9.2 **(2006-2015)** Sustain funding for technological development from appropriate sources.

Status

This RAP Recommendation focuses on projects involved with technological development geared towards reducing implementation costs and to improve effectiveness in reducing contaminant loadings. The federal and municipal governments have provided a significant level of funding into technologies for remediating contaminated sediments and sewage treatment. Two workshops were held in 2000/2001 under the auspices of the Great lakes Sustainability Fund (GLSF) to address this issue.

A series of funding programs through Environment Canada have assisted Hamilton Harbour RAP projects, including technological development, since 1991: Great Lakes Cleanup Fund (1991-1995), Great Lakes 2000 Cleanup Fund (1995-2000), and Great Lakes Sustainability Fund (2000 – present). These programs fund up to one third of project costs. Since 2001, the Hamilton Harbour RAP Office has hosted an annual briefing meeting with local GLSF applicants before the

deadline to assist them in targeting their proposals to highlight connections to RAP Recommendations and delisting objectives.

The OMOE provides a program for New Environmental Technologies Evaluation (NETE). The program covers any innovative technologies, which may be used to reduce emissions or discharges to the environment, which require approval under the Environmental Protection Act or the Ontario Water Resources Act.

Other sources of funding include the Green Infrastructure Funding Programs administered by the Federation of Canadian Municipalities.

IV.7.10 Multi-lateral Partnerships

Recommendation No. RM –10

(1992 Rec. 49)

Recognizing the substantial funds needed to effect major remedial actions and the necessity for shared responsibility for implementation; the principle of multi-lateral partnership agreements is one means of achieving realistic solutions.

Responsible Agencies

All Agencies

Ongoing Target

RM – 10.1 Actively pursue the principle of multi-lateral partnership agreements as one means of achieving realistic solutions.

Status

A variety of multi-lateral partnerships have been utilized to implement recommendations of the Remedial Action Plan. Many of the projects discussed throughout this report incorporate multilateral partnerships through funding arrangements and/or shared responsibility for realistic implementation. The Bay Area Implementation Team (BAIT) is the forum where the partnerships commonly are struck.

Examples of partnerships working on the RAP include, but are not limited to:

- Fish & Wildlife Habitat Restoration Project
- Hamilton-Halton Watershed Stewardship Program
- Hamilton Harbour Watershed Planning Network
- Wildlife Management Advisory Committee
- Hamilton Industrial Environmental Association
- Hamilton Waterfront Trust