

Marsh Bird and Amphibian Communities in the Port Hope Harbour AOC, 1995 – 2002.



Purpose of the MMP

The Marsh Monitoring Program (MMP) was established to provide baseline surveys of marsh bird and amphibian populations and their habitats in marshes within Areas of Concern (AOCs) in the Great Lakes basin, sites where rehabilitation and restoration efforts have taken place or are planned in AOCs, and in many other Great Lakes basin wetlands. Marsh bird surveys were first implemented in the Canadian and bi-national AOCs in 1994. In 1995, the program expanded throughout the basin to include surveys of calling amphibians. To date, over 650 MMP volunteers have surveyed marsh bird and/or amphibian populations and their habitats. Information about abundance and diversity of these species provides useful, and easily obtainable indicators of habitat quality, structure and areal extent.

Purpose of the Report

This report summarizes results of MMP surveys done in the Port Hope Harbour AOC from 1995 to 2002. It also explains how the set of indicators used by the MMP assesses marsh quality and describes the significance of MMP results for this AOC. Results herein provide an opportunity to determine whether or not amphibian and/or marsh bird community status at Port Hope Harbour AOC wetlands are impaired. This report should be read in conjunction with the context and analyses description in the Marsh Monitoring Program: Areas of Concern Summary Report 1995 – 2002.

Highlights of the MMP's Port Hope Harbour Results

Indicator Species

The presence of the following suite of marsh bird and amphibian species indicates high quality marsh habitat.

A **T** indicates those species found in the Port Hope Harbour AOC marshes.

Birds

American Bittern (AMBI)
American Coot (AMCO)
Black Tern (BLTE)
Blue-winged Teal (BWTE)
Common Moorhen (COMO)

T Common Snipe (COSN)
Least Bittern (LEBI)
Marsh Wren (MAWR)
C. Moorhen/ A.Coot (MOOT)
Pied-billed Grebe (PBGR)
Sora
Virginia Rail (VIRA)

Amphibians

T Bullfrog (BULL)
T Chorus Frog (CHFR)
Mink Frog (MIFR)
T Northern Leopard Frog (NLFR)
T Spring Peeper (SPPE)

- Since the program's initiation, only one route surveyed for both amphibians and marsh birds has been monitored in the Port Hope Harbour AOC. However, during 1999 only marsh birds were surveyed.
- Overall, eight amphibian species were recorded in the Port Hope Harbour AOC, including four amphibian indicator species (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper). In general, species were recorded at low and high levels (Call Level Codes 1 and 3).
- Overall, eight species of marsh nesters were recorded in the Port Hope Harbour AOC – a very low level of diversity. Further, only one (Blue-winged Teal) of 12 marsh bird indicator species was recorded in the Port Hope Harbour AOC. Red-winged Blackbird was the most abundant nesting species, followed by Canada Goose, Mallard and Mute Swan. Great Blue Heron was the most abundant water forager species and Tree Swallow was the only aerial forager recorded.
- Of the four amphibian indicator species present in the Port Hope Harbour AOC, relative occurrence of Chorus Frog scored above the average of Great Lakes basin non-AOC routes, however, Bullfrog, Northern Leopard Frog and Spring Peeper relative occurrence scored below the average of Great Lakes basin non-AOCs. Abundance of the only marsh bird indicator species (Blue-winged Teal) that occurred in the Port Hope Harbour AOC scored within the average of this species at Great Lakes basin non-AOC routes.

- Marsh bird indicator species diversity and marsh nesting bird species diversity in the Port Hope Harbour AOC scored below the average of those at Great Lakes basin non-AOC routes. Further, total amphibian species diversity and amphibian indicator species diversity scored below the average of those at Great Lakes basin non-AOC routes. Overall, this AOC is apparently impaired in its ability to support marsh dependent species however, monitoring of more routes at this AOC is required to make a more definitive assessment.

MMP Methods

Table 1. Marsh Monitoring Program Survey Methods

Survey	Time commitment	Skills Required	Survey Duration	Weather conditions
Birds	2 evenings, 10 days apart, between May 20 and July 5	ability to identify about 50 common birds	10 minutes at each station	warm, dry weather with little or no wind
Amphibians	3 nights, 15 days apart, between April 1 and July 15	ability to learn about 10 amphibian calls	3 minutes at each station	warm, dry weather with little or no wind

A route, consisting of up to eight semi-circular stations (100 m radius for marsh birds and unlimited distance for amphibians), is monitored in each marsh being surveyed. Stations are usually accessed by foot, but can be surveyed by canoe or boat. Marshes must be a minimum of two hectares and if very large, may support more than one route. Stations must be 500 metres apart for amphibians surveys and 250 metres apart for marsh bird surveys. Numbers of marsh birds heard calling or seen in the station are recorded. At amphibian stations, one of three Call Level Codes is used to record calling intensity of each species; abundance estimates are also made. Participants are also asked to identify if they hear each amphibian inside and/or outside of the 100 m semi-circle. Each MMP volunteer is provided with a training kit that fully explains survey methods. The kit also includes a copy of the MMP Training Tape that aids volunteers in learning songs and calls of common marsh birds and amphibians. For further information about these methods, please refer to the 2003 edition of the *MMP Training Kit and Instructions for Surveying Marsh Birds, Amphibians and their Habitats*, which is available from Bird Studies Canada.

MMP in the Port Hope Harbour AOC

Since the program's initiation, only one route surveyed for both amphibians and marsh birds has been monitored in the Port Hope Harbour AOC. In 1999 only marsh birds were surveyed at this route.

Port Hope Harbour was designated an AOC because of restrictions on dredging activities. Marsh habitats sensitive to such activities in this AOC should be monitored by the MMP.

To become involved, please contact the MMP Volunteer Coordinator, Bird Studies Canada at (888) 448-2473 (phone), (519) 586-3532 (fax), or by email at aqsurvey@bsc-eoc.org.

Results

The only marsh monitored in the Port Hope Harbour AOC was small in size and occurred inland, thus this marsh was not affected directly by Lake Ontario water levels and perhaps also not by dredging activities in the harbour.

Overall, eight amphibian species were recorded in the Port Hope Harbour AOC, including four amphibian indicator species (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper) (Table 3). According to the Ontario Herpetofaunal Summary, four amphibian indicator species have historically occurred in this AOC; Bullfrog has also historically been present. In general, species were recorded at low and high levels (Call Level Codes 1 and 3).

Overall, eight species of marsh nesters were recorded in the Port Hope Harbour AOC – a very low level of diversity (Table 4). Further, only one (Blue-winged Teal) of 12 marsh bird indicator species was recorded in the Port Hope Harbour AOC. According to the Ontario Breeding Bird Atlas database, seven marsh bird indicator species have historically been recorded in this AOC: American Bittern, Black Tern, Blue-winged Teal, Common Moorhen, Marsh Wren, Sora and Virginia Rail. Densities for three of eight marsh nesting species were higher at Port Hope routes than at Great Lakes basin non-AOC routes. Red-winged Blackbird was the most abundant nesting species, followed by Canada Goose, Mallard and Mute Swan.

Three water foragers and one aerial forager were recorded in the Port Hope Harbour AOC – a low level of diversity (Table 4). Great Blue Heron was the most abundant water forager species and Tree Swallow was the only aerial forager recorded. Densities were higher at Port Hope routes than averages of Great Lakes basin non-AOC routes for all water foraging species and aerial foraging species.

Conclusions

Of the four amphibian indicator species present in the Port Hope Harbour AOC, relative occurrence of Chorus Frog scored above the average of Great Lakes basin non-AOC routes, however, Bullfrog, Northern Leopard Frog and Spring Peeper relative occurrence scored below average of those at Great Lakes basin non-AOC routes (Table 5). Abundance of the only marsh bird indicator species (Blue-winged Teal) that occurred in the Port Hope Harbour AOC scored within the average of that for this species at Great Lakes basin non-AOC routes.

Marsh bird indicator species diversity and marsh nesting bird species diversity in the Port Hope Harbour AOC scored below the average of those at Great Lakes basin non-AOC routes (Table 6). Further, total amphibian species diversity and amphibian indicator species diversity scored below those at Great Lakes basin non-AOC routes. The Port Hope Harbour AOC appears to be impaired in its ability to support a high diversity of amphibian and marsh bird species (Table 6). Overall, this AOC is impaired in its ability to support marsh dependent species however, monitoring of more routes at this AOC is required to make a more definitive assessment.

Recommendations

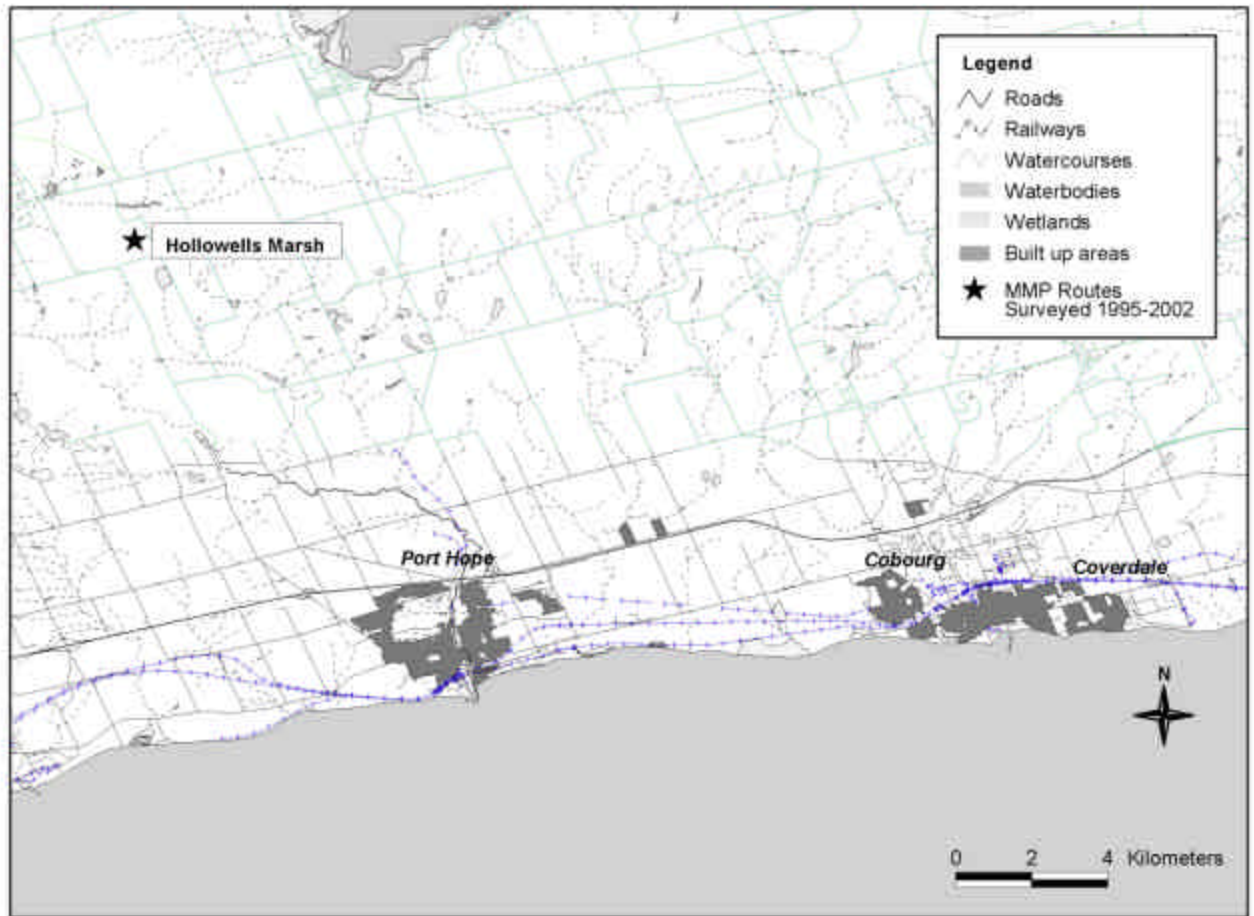
Efforts should be made to monitor appropriate marsh habitat in areas that may be affected by dredging and/or other potential impaired beneficial uses. Such efforts should monitor marsh bird and amphibian populations to properly address the effects of habitat loss. Efforts should be made to encourage all MMP volunteers surveying routes within AOCs to rigorously collect habitat information at their survey stations. Complementary amphibian and marsh bird surveys should be conducted at all new and existing routes to permit a more definitive quantitative analysis of this AOC's wetland-dependent wildlife.

Volunteer Efforts

One participant contributed over 64 person hours between 1995 and 2002 to the program at this AOC. In addition, many volunteer hours at non-AOC routes were contributed to produce results that were used for comparison purposes. Our thanks extend to Ainslie Surette who conducted the Port Hope surveys.

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MMP routes in the Port Hope Harbour AOC.

Table 2. Marsh Monitoring Program Routes in the Port Hope AOC.

Year	Route Type	# Routes	# Volunteers
1995	Amphibian	0	0
	Bird	0	0
	Both	1	1
1996	Amphibian	0	0
	Bird	0	0
	Both	1	1
1997	Amphibian	0	0
	Bird	0	0
	Both	1	1
1998	Amphibian	0	0
	Bird	0	0
	Both	1	1
1999	Amphibian	0	0
	Bird	1	1
	Both	0	0
2000	Amphibian	0	0
	Bird	0	0
	Both	1	1
2001	Amphibian	0	0
	Bird	0	0
	Both	1	1
2002	Amphibian	0	0
	Bird	0	0
	Both	1	1
Total	Amphibian	0	0
	Bird	1	1
	Both	1	1

Table 3. Amphibian species composition and abundance (maximum Call Level Code¹) at Port Hope AOC MMP routes from 1995 through 2002. Shading denotes indicator species.

Amphibian Species	Hollowells Marsh	Port Hope (maximum)
American Toad	3	3
Bullfrog	1	1
Chorus Frog	3	3
Gray Treefrog	1	1
Green Frog	-	-
Northern Leopard Frog	1	1
Pickerel Frog	3	3
Spring Peeper	3	3
Wood Frog	3	3

¹ Call Level Code 1: Individuals can be counted; calls not simultaneous. Call Level Code 2: Calls distinguishable, some simultaneous calling. Call Level Code 3: Full chorus; calls continuous and overlapping.

Table 4. Marsh bird species composition and abundance (mean number per 10 stations) in the Port Hope AOC from 1995 through 2002. Means for Port Hope routes and Great Lakes basin non-AOC routes are given for comparison. Shading denotes indicator species and 'p' indicates that a species was present only outside of the survey stations.

Marsh Bird Species	Hollowells Marsh	Port Hope AOC Mean	Great Lakes Basin Mean
<i>Marsh Nesters</i>			
Blue-winged Teal	2.2	2.20	0.77
Canada Goose	16.6	16.60	4.56
Eastern Kingbird	0.3	0.30	1.51
Green-winged Teal	0.2	0.20	0.15
Mallard	2.3	2.30	5.36
Mute Swan	2.3	2.30	0.66
Red-winged Blackbird	20.5	20.50	44.89
Song Sparrow	0.3	0.30	5.16
<i>Water Foragers</i>			
Belted Kingfisher	1.4	1.40	0.53
Green Heron	1.3	1.30	0.52
Great Blue Heron	2.9	2.90	1.66
<i>Air Foragers</i>			
Tree Swallow	53.7	53.70	32.59

Table 5. Status assessment of marsh bird and amphibian indicator species abundance in the Port Hope AOC from 1995 through 2002. ' - ' denotes values below the Great Lakes basin average. ' 0 ' denotes values within the Great Lakes basin average. ' + ' denotes values above the Great Lakes basin average. Blank indicates that the species was not present and ' p ' indicates that a species was present only outside of the sample stations.

Route Name	Marsh Bird Indicator Species											Amphibian Indicator Species					
	AMBI	AMCO	BLTE	BWTE	COMO	COSN	LEBI	MAWR	MOOT	PBGR	SORA	VIRA	BULL	CHFR	MIFR	NLFR	SPPE
Hollowells Marsh				0									-	+		-	-
Port Hope Overall Assessment				0									-	+		-	-

Table 6. Status of Port Hope marshes from 1995 to 2002¹. ' - ' denotes values below the Great Lakes basin non-AOC average. ' 0 ' denotes values within the Great Lakes basin non-AOC average. ' + ' denotes values above the Great Lakes basin non-AOC average.

Route Name ²	Survey Type	Year	Number of Stations	Assessment of Marsh Bird and Amphibian Species Diversity				Overall Assessment ³
				Marsh Nesting Bird Diversity	Marsh Bird Indicator Species Diversity	Amphibian Species Diversity	Amphibian Indicator Species Diversity	
Hollowells Marsh I, Small	Amph Bird	1995 - 2002	8 6	-	-	-	-	0
Port Hope Overall Assessment				-	-	-	-	0

¹ See the Marsh Monitoring Program's 1997 Final Technical Report for a detailed description of the scoring system.

² C = coastal, I =inland. Tiny (2 - 2.5 ha), Small (2.5 - 5 ha), Medium (5 - 25 ha), Huge (> 50 ha).

³ A score of 0, 1 or 2 indicates impairment, a score of 3, 4 or 5 indicates no apparent impairment and a score of 6, 7 or 8 indicates an above average marsh.