

Marsh Bird and Amphibian Communities in the Toronto and Region 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 Toronto and Region 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 Toronto and Region 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 Reports 1995 – 2002.

Highlights of the MMP's Toronto and Region 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 Toronto and Region AOC marshes.

Birds

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

T Marsh Wren (MAWR)
C. Moorhen/ A.Coot (MOOT)
Pied-billed Grebe (PBGR)

T Sora
T 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, 13 amphibian, eight marsh bird and eight routes surveyed for both amphibians and marsh birds have been established in the Toronto and Region AOC. During the period from 1995 through 2002, number of routes surveyed were relatively stable, but showed moderate annual decreases between 1999 and 2002.
- Overall, eight amphibian species were recorded, including four amphibian indicator species (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper). The most common species occurring at Toronto and Region marshes were American Toad (occurring at 14 of 20 routes) and Green Frog (occurring at 10 of 20 routes). In general, species were recorded at low to moderate levels (Call Level Codes 1 and 2) at most routes and moderate to high at two routes.
- Overall, 14 species of marsh nesters were recorded in the Toronto and Region AOC – a moderate to low level of diversity. Further, only three (Marsh Wren, Sora, Virginia Rail) of 12 marsh bird indicator species were recorded in the Toronto and Region AOC. Red-winged Blackbird was the most abundant nesting species, followed by Common Grackle, Song Sparrow and Mallard. Black-crowned Night Heron was the most abundant water forager species and Tree Swallow was the most abundant aerial forager.

- Occurrence of all four of the amphibian indicator species present (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper) scored within the average of those at Great Lakes basin non-AOC routes. Abundance of all three marsh bird indicator species (Marsh Wren, Sora, Virginia Rail) that occurred in the Toronto and Region AOC scored within the average of those at Great Lakes basin non-AOC routes.
- Marsh bird indicator species diversity and marsh nesting bird species diversity in the Toronto and Region 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 impaired in its ability to support marsh dependent species.

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 established 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 Toronto and Region AOC

Since the program's initiation, 13 amphibian, eight marsh bird and eight routes surveyed for both amphibians and marsh birds have been monitored in the Toronto and Region AOC. During the period from 1995 through 2002, number of routes surveyed were relatively stable, but showed moderate annual decreases between 1999 and 2002.

A number of habitat rehabilitation projects have been proposed in the Toronto and Region AOC that address loss of marsh habitat, in addition to shoreline and riverine habitats. Such sites should be monitored by the MMP.

There are additional marshes in the Toronto and Region AOC where routes could be established and existing routes where complementary marsh bird or amphibian surveys would permit a more definitive evaluation of the AOC's wetland-dependent wildlife. Volunteer recruitment to fill these needs is ongoing.

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

Marshes in the Toronto and Region AOC ranged from tiny to large in size, which is in itself a positive aspect. Habitat data were collected for 20 Toronto and Region marshes. Fifteen of these marshes were classified as coastal marshes (thus affected by fluctuations in Lake Ontario water levels) and five marshes were classified as inland marshes. Four Toronto and Region routes (Bluffer's Park, Col. Sam Smith Park, Mouth of Mimco Creek, Tommy Thompson Park) have been classified as habitat rehabilitation sites in the Toronto and Region AOC. Further, four Toronto and Region routes (Highland Creek Sewage, Humber Marsh South, Rouge River Marsh South, Rowntree Marsh) have been classified as provincially significant under the Ontario provincial wetlands evaluation system.

The number of amphibians in the Toronto and Region AOC ranged from one to eight per route (Table 3). Overall, eight amphibian species were recorded, including four amphibian indicator species (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper). According to the Ontario Herpetofaunal Summary, four of the five amphibian indicator species have historically been present in this AOC, however the range of Mink Frog does not include this AOC. The most common species occurring at Toronto and Region marshes were American Toad, occurring at 14 of 20 routes, and Green Frog, occurring at 10 of 20 routes. In general, species were recorded at low to moderate levels (Call Level Codes 1 and 2) for most routes, and moderate to high levels (Call Level Codes 2 and 3) at two routes.

The number of marsh nesters at Toronto and Region AOC routes ranged from zero to 11 (Table 4). Overall, 14 species of marsh nesters were recorded in the Toronto and Region AOC – a moderate to low level of diversity. Further, only three (Marsh Wren, Sora, Virginia Rail) of 12 marsh bird indicator species were recorded in the Toronto and Region AOC. Densities of all marsh nesting species, except Canada Goose, Common Grackle, Mallard and Song Sparrow were lower at Toronto and Region routes than at Great Lakes basin non-AOC route averages. Red-winged Blackbird was the most abundant nesting species, followed by Common Grackle, Song Sparrow and Mallard.

Seven water foragers and seven aerial foragers were recorded in the Toronto and Region AOC – a very high level of diversity (Table 4). Two species of conservation interest in Ontario (Black-crowned Night Heron and Great Egret) were also present. Black-crowned Night Heron was the most abundant water forager species and Tree Swallow was the most abundant aerial forager. Densities were higher at Toronto and Region routes than at Great Lakes basin non-AOC routes for two (Black-crowned Night Heron and Common Tern) of seven water foraging species and for three (Bank Swallow, Chimney Swift, Common Nighthawk) of seven aerial foraging species.

Conclusions

Occurrence of all four of the amphibian indicator species present (Bullfrog, Chorus Frog, Northern Leopard Frog, Spring Peeper) scored within the average of those at Great Lakes basin non-AOC routes (Table 5). Abundance of all three marsh bird indicator species (Marsh Wren, Sora, Virginia Rail) that occurred in the Toronto and Region AOC scored within the average of that at Great Lakes basin non-AOC routes. Thus, no amphibian or marsh bird indicator species occurrence or abundance scored above the average of those at Great Lakes basin non-AOC routes.

Marsh bird indicator species and marsh nesting bird diversity in the Toronto and Region 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 the average of those at Great Lakes basin non-AOC routes. The Toronto and Region 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.

Recommendations

Efforts should be made to continue to rehabilitate marsh habitat and to monitor marsh bird and amphibian populations to properly address the effects of habitat loss. MMP routes should be established at all marsh rehabilitation projects. Efforts should be made to encourage all MMP volunteers surveying routes within AOCs to

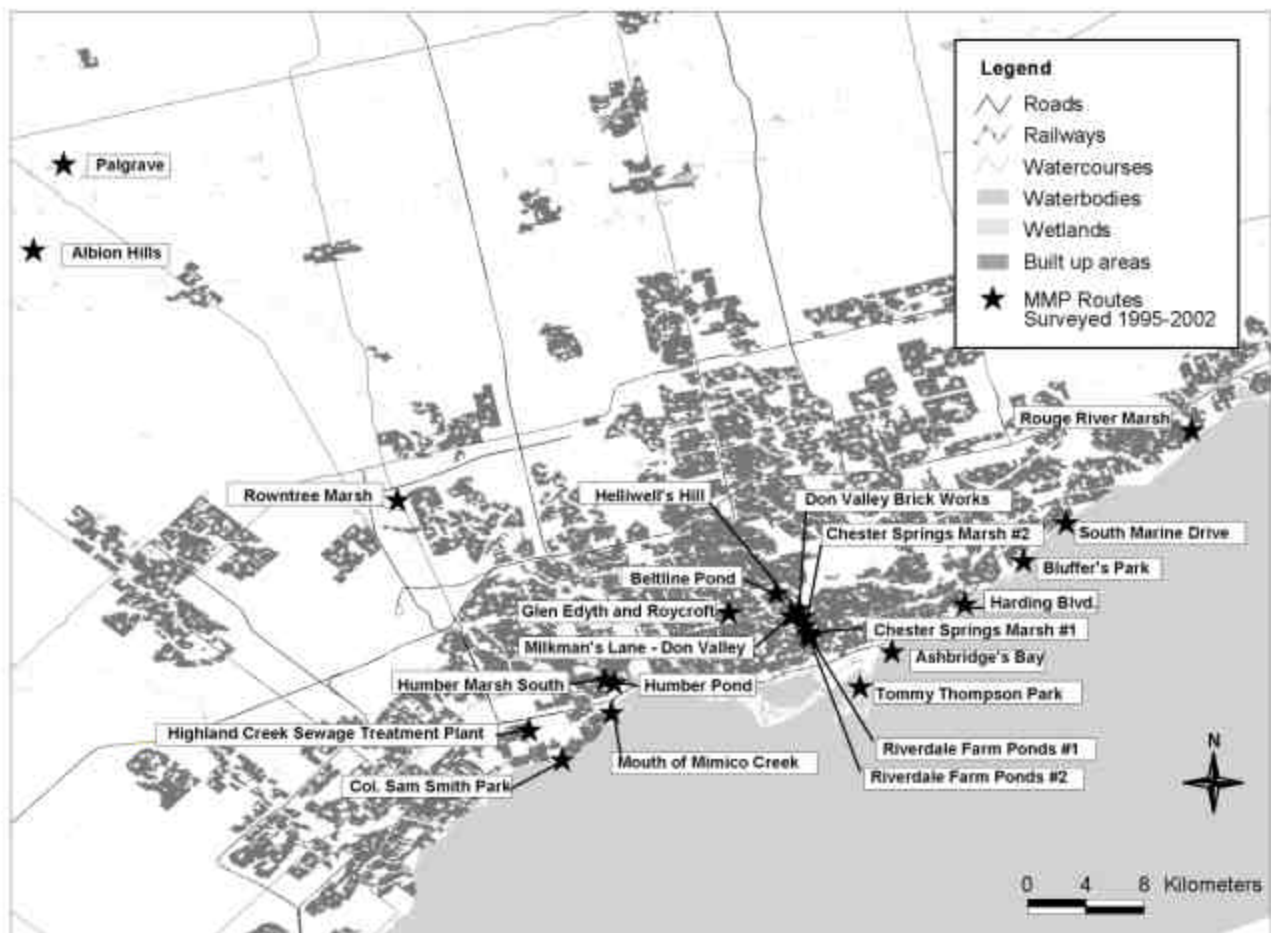
rigorously collect habitat information at their survey stations. Complementary amphibian and marsh bird surveys should be conducted at all new and existing routes to permit a more definitive quantitative analysis of this AOC's wetland-dependent wildlife.

Volunteer Efforts

Twenty-two participants contributed over 616 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 the dedicated participants who conducted the Toronto and Region surveys: C. Agnew, Lianne Bellisario, Jeff Borisko, Tamara Chipperfield, Dan Clayton, Theresa Dobko, Marcel Gahbauer, James Hartley, Natalie Helferty, Grant Hurlburt, Scott Jarvie, David Milsom, Laura Murray, Joan O'Donnell, Greg Sadowski, T. Ronald Scovell, Katie Simmons, Edward Suddon, Annette Tavares, Grace Tesa, P. Van Haltero and Reinder Westerhoff.

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MMP routes in the Toronto and Region AOC.

Table 2. Marsh Monitoring Program Routes in the Toronto and Region AOC.

Year	Route Type	# Routes	# Volunteers
1995	Amphibian	8	3
	Bird	4	3
	Both	1	1
1996	Amphibian	5	3
	Bird	1	1
	Both	3	3
1997	Amphibian	5	2
	Bird	2	2
	Both	3	3
1998	Amphibian	8	4
	Bird	5	3
	Both	3	3
1999	Amphibian	4	3
	Bird	2	2
	Both	3	2
2000	Amphibian	3	2
	Bird	0	0
	Both	4	3
2001	Amphibian	1	1
	Bird	2	2
	Both	3	3
2002	Amphibian	3	2
	Bird	3	1
	Both	1	1
Total	Amphibian	13	10
	Bird	8	8
	Both	8	7

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

Amphibian Species	Route Number ²																					Metro Toronto (maximum)
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
American Toad	-	1	2	-	2	-	-	2	-	1	1	1	-	1	3	1	2	3	2	1	2	3
Bullfrog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Chorus Frog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	1
Gray Treefrog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
Green Frog	-	-	1	-	1	1	1	-	-	-	1	1	-	1	2	-	-	3	1	-	-	3
Northern Leopard Frog	-	-	-	-	-	1	-	-	-	1	1	1	-	-	3	-	1	2	-	1	-	3
Spring Peeper	-	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-	1	3	3
Wood Frog	-	1	-	-	-	-	-	-	-	1	-	-	-	-	3	-	1	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.

²Route Name Route Number
 Ashbridge's Bay 1
 Bluffer's Park 2
 Chester Springs Marsh #1 3
 Chester Springs Marsh #2 4
 Col. Sam Smith Park 5
 Don Valley Brick Works 6
 Glen Edyth and Roycroft 7
 Harding Boulevard 8
 Helliwell's Hill 9
 Highland Creek Sewage 10
 Humber Marsh South 11
 Humber Pond 12
 Milkman's Lane – Don Valley 13
 Mouth of Mimco Creek 14
 Palgrave 15
 Riverdale Farm Ponds #2 16
 Rouge River Marsh 17
 Rowntree Marsh 18
 South Marine Drive 19
 Tommy Thompson Park 20

Table 4. Marsh bird species composition and abundance (mean number per 10 stations) in the Toronto and Region AOC from 1995 through 2002. Means for Toronto and Region 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	Route Number ¹													Metro Toronto AOC Mean	Great Lakes Basin Mean	
	1	2	3	4	5	6	7	8	9	10	11	12	13			
<i>Marsh Nesters</i>																
Canada Goose				10.0				54.2	p	7.5	10.0	p			7.32	4.56
Common Grackle	5.7		1.7	10.0	10.0	p		3.1	p	46.7	10.0	27.2	5.0		9.97	7.70
Common Yellowthroat	1.7								11.7	1.7		p			1.73	6.41
Eastern Kingbird			5.0	10.0	1.7			0.8							0.83	1.51
Mallard	p		16.7		p			14.2		64.2	15.0	0.5			7.55	5.36
Marsh Wren	1.3								1.7		5.0				0.62	8.30
Mute Swan								2.5			10.0				0.65	0.66
Red-winged Blackbird	27.0		61.7	20.0	38.3	3.0	20.0	45.0	33.3	30.0	45.0	60.2	95.0		36.04	44.89
Song Sparrow	9.0		25.0	20.0	5.0	6.0		7.5	11.7	10.8		16.4	10.0		9.46	5.16
Sora	4.0							0.8	p						0.83	1.06
Swamp Sparrow	14.3								11.7		15.0	1.7			4.69	10.13
Virginia Rail	8.7							0.8	3.3				10.0		2.44	3.12
Willow Flycatcher								1.1							0.12	0.54
Yellow Warbler	8.7		8.3	10.0				p	1.7	6.3	p	1.1			3.06	6.13
<i>Water Foragers</i>																
Black-crowned Night Heron			1.7	p	p			7.8		10.0		p	p		1.67	0.42
Belted Kingfisher	1.0							p							0.19	0.53
Caspian Tern								1.9							0.22	0.33
Common Tern								9.2			5.0		p		1.20	0.84
Great Blue Heron			p					1.1	1.7	p		1.7			0.49	1.66
Great Egret								0.8							0.09	0.47
Green Heron												1.7			0.19	0.52
<i>Air Foragers</i>																
Bank Swallow		10.0	1.7					9.4		5.8				30.0	3.03	2.95
Barn Swallow			11.7		1.7	p		4.7	18.3	3.8	10.0				3.83	8.86
Chimney Swift		p	6.7		18.3					24.6					4.11	1.04
Cliff Swallow										1.3					0.09	0.25
Common Nighthawk					3.3										0.37	0.27
N. Rough-winged Swallow											2.5				0.19	1.70
Tree Swallow	3.3		31.7		15.0		10.0	27.8	18.3	15.4	20.0		130.0		15.65	32.59

¹ Route Name	Route Number
Albion Hills	1
Beltine Pond	2
Chester Springs Marsh #1	3
Chester Springs Marsh #2	4
Don Valley Brick Works	5
Glen Edyth and Roycroft	6
Helliwells' Hill	7
Humber Marsh	8
Palgrave	9
Riverdale Farm Ponds #1	10
Rouge River Marsh	11
Rowntree Marsh	12
Tommy Thompson Park	13

Table 5. Status assessment of marsh bird and amphibian indicator species abundance in the Toronto and Region 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	
Albion Hills								0				0	0					
Ashbridge's Bay																		
Beltine Pond																		
Bluffers' Park																		
Chester Springs #2																		
Chester Springs Marsh #1																		
Col. Sam Smith Park																		
Don Valley Brick Works																0	0	
Glen Edyth and Roycroft																		
Harding Boulevard																		
Helliwell's Hill																		
Highland Creek Sewage																0		
Humber Marsh South												0	0			0		
Humber Pond																0		
Milkman's Lane - Don Valley																		
Mouth of Mimico Creek																		
Palgrave								0				0	0	0	0	0	0	0
Riverdale Farm Ponds #1																		
Rouge River Marsh								0								0		
Rowntree Marsh																0		
South Marine Drive																		
Tommy Thompson Park												0				0		-
Metro Toronto Overall Assessment								0				0	0	0	0	0	0	0

Table 6. Status of Toronto and Region 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	
Albion Hills I, Medium	Bird	1995 - 1997	4	0	-			1
Ashbridge's Bay I, Tiny	Amph	1995	1			-	-	0
Bluffer's Park R, C, Tiny	Amph	2000	1			-	-	0
Chester Spring #2 C, Small	Amph Bird	1997 - 2000	3 1	+	-	-	-	2
Chester Spring Marsh #1 C, Tiny	Amph Bird	1997 - 2002	1 1	0	-	-	-	1
Col. Sam Smith Park R, C, Tiny	Amph	1996 - 1999	2			-	-	0
Don Valley Brick Works C, Medium	Amph Bird	2001 - 2002	2 2	-	-	-	0	1
Glen Edyth and Roycroft I, Tiny	Amph Bird	1998 - 2002	2 2	-	-	-	-	0
Harding Boulevard C, Tiny	Amph	1995	1			-	-	0
Helliwell's Hill C, Tiny	Amph Bird	1998 - 2000	1 1	-	-	-	-	0
Highland Creek Sewage C, P, Tiny	Amph	1995, 1997 - 1998	1			-	-	0
Humber Marsh C, P, Large	Amph Bird	1995- 1998, 2002	3 3	-	-	-	-	0
Humber Pond C, Tiny	Amph	1995 - 1996	1			-	-	0
Mouth of Mimco Creek R, C, Small	Amph	1996 - 1999	1			-	-	0
Palgrave I, Small	Amph Bird	1995 - 1996	3 3	-	-	0	0	2
Riverdale Farm Ponds #1 C, Medium	Amph Bird	1998 - 2002	2 2	+	-	-	-	2
Rouge River Marsh C, P, Large	Amph Bird	1995 - 1999	2 1	+	-	-	-	2
Rowntree Marsh I, P, Tiny	Amph Bird	1995 - 2002	3 3	-	-	-	-	0
South Marine Drive C, Tiny	Amph	1995	2			-	-	0
Tommy Thompson Park R, C, Tiny	Amph Bird	1996 - 1998, 2002	4 1	0	+	-	-	3
Metro Toronto Overall Assessment				-	-	-	-	0

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

² R = rehabilitation site, C = coastal, I = inland, P = provincially significant under the Ontario provincial wetlands evaluation system. 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.