

# Marsh Bird and Amphibian Communities in the St. Clair River (Canada and USA) 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 to include surveys of calling amphibians. To date, over 1,700 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 St. Clair River 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 St. Clair River 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 St. Clair River 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 St. Clair River AOC marshes.

#### *Birds*

- T American Bittern (AMBI)
- T American Coot (AMCO)
- T Black Tern (BLTE)
- T Blue-winged Teal (BWTE)
- T Common Moorhen (COMO)
- Common Snipe (COSN)
- T Least Bittern (LEBI)
- T Marsh Wren (MAWR)
- T C. Moorhen/ A.Coot (MOOT)
- T 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, two amphibian, seven marsh bird and five routes surveyed for both amphibians and marsh birds have been established in the St. Clair River AOC. During the period from 1995 through 2002, number of routes surveyed and number of volunteers were relatively stable.
- 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 St. Clair River marshes were Bullfrog and Green Frog, occurring at all five routes, and American Toad occurred at four of five routes. Species were recorded at low levels (Call Level Code 1 and 2) at Harsen's Island routes, and were recorded at various levels (Call Level Code 1, 2 ad 3) St Clair N.W.A. – Bear Creek A and B.
- Overall, 29 species of marsh nesters were recorded in the St. Clair River AOC – a very high level of diversity. Further, 11 of 12 marsh bird indicator species were recorded in the St. Clair River AOC. Red-winged Blackbird was the most abundant nesting species, followed by Marsh Wren, Black Tern and Mallard. Common Tern was the most abundant water forager species and Tree Swallow was the most abundant aerial forager.
- Of the four amphibian indicator species present in the St Clair River AOC, Bullfrog and Northern Leopard Frog relative

occurrence scored above that for these species at Great Lakes basin non-AOC routes, and Chorus Frog relative occurrence scored within the average of Great Lakes basin non-AOC routes. Abundance of four marsh bird indicator species (Black Tern, Marsh Wren, Common Moorhen/American Coot, Pied-billed Grebe) that occurred in the St. Clair River AOC scored within the average of that for those species at Great Lakes basin non-AOC routes, six marsh bird indicator species (American Bittern, American Coot, Common Moorhen, Least Bittern, Sora, Virginia Rail) scored below the average of that for those species at Great Lakes basin non-AOC routes and Blue-winged Teal was recorded only outside of MMP station boundaries.

- Marsh bird indicator species diversity scored above the average and marsh nesting bird diversity in the St. Clair River AOC scored within the average of those at Great Lakes basin non-AOC routes. However, 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 not 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
<b>Birds</b>	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
<b>Amphibians</b>	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 amphibian 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 St. Clair River AOC

Since the program's initiation, two amphibian, seven marsh bird and five routes surveyed for both amphibians and marsh birds have been monitored in the St. Clair River AOC. During the period from 1995 through 2002, the number of routes surveyed and number of volunteers were relatively stable.

A number of habitat rehabilitation projects have been proposed in the St. Clair River 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 St. Clair River 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](mailto:aqsurvey@bsc-eoc.org).

## Results

Marshes in the St. Clair River AOC ranged from tiny to huge in size, which is in itself a positive aspect. Habitat data were collected at 12 St. Clair River routes. Eight of these were classified as coastal marshes, thus affected by fluctuations in St. Clair River water levels, and four marshes were classified as inland marshes. Two St. Clair River routes (St. Clair - N.W.A. – St. Luke's and St. John's - East End) have been classified as provincially significant under the Ontario provincial wetlands evaluation system.

The number of amphibians recorded in the St. Clair River AOC ranged from two 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, the species range of Mink Frog does not include this AOC. The most common species occurring at St. Clair River marshes were Bullfrog and Green Frog, occurring at all five routes, and American Toad which occurred at four of five routes. Species were recorded at low levels (Call Level Code 1 and 2) at Harsen's Island routes, and were recorded at various levels (Call Level Code 1, 2 and 3) at St Clair N.W.A. – Bear Creek A and B.

The number of marsh nesters at St. Clair River AOC routes ranged from seven to 22 (Table 4). Overall, 29 species of marsh nesters were recorded in the St. Clair River AOC – a very high level of diversity. Further, 11 (American Bittern, American Coot, Black Tern, Blue-winged Teal, Common Moorhen, Least Bittern, Marsh Wren, American Coot/Common Moorhen, Pied-billed Grebe, Sora, Virginia Rail) of 12 marsh bird indicator species were recorded in the St. Clair River AOC. According to the Ontario Breeding Bird Atlas database, only four indicator species have historically been recorded in this AOC: Least Bittern, Virginia Rail, American Coot and Marsh Wren. Densities for 12 of 29 marsh nesting species were higher at St. Clair River routes than averages of Great Lakes basin non-AOC routes. Red-winged Blackbird was the most abundant nesting species, followed by Marsh Wren, Black Tern and Mallard.

Seven water foragers and seven aerial foragers were recorded in the St. Clair River 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. Common Tern was the most abundant water forager species and Tree Swallow was the most abundant aerial forager. Densities were higher at St. Clair River routes than at Great Lakes basin non-AOC routes for two (Caspian Tern and Common Tern) of seven water foraging species and for five (Barn Swallow, Chimney Swift, Common Nighthawk, Purple Martin, Tree Swallow) of seven aerial foraging species.

## Conclusions

Of the four amphibian indicator species present in the St Clair River AOC, Bullfrog and Northern Leopard Frog relative occurrence scored above that for these species at Great Lakes basin non-AOC routes, and Chorus Frog relative occurrence scored within the average of Great Lakes basin non-AOC routes (Table 5). Abundance of four marsh bird indicator species (Black Tern, Marsh Wren, Common Moorhen/American Coot, Pied-billed Grebe) that occurred in the St. Clair River AOC scored within the average of that for those species at Great Lakes basin non-AOC routes, six marsh bird indicator species (American Bittern, American Coot, Common Moorhen, Least Bittern, Sora, Virginia Rail) scored below the average of that for those species at Great Lakes basin non-AOC routes and Blue-winged Teal was recorded only outside of MMP station boundaries.

Marsh bird indicator species diversity scored above the average and marsh nesting bird diversity in the St. Clair River AOC scored within the average of those at Great Lakes basin non-AOC routes (Table 6). However, total amphibian species diversity and amphibian indicator species diversity scored below the average of those at Great Lakes basin non-AOC routes. The St. Clair River AOC is apparently not impaired in its ability to support a high diversity of marsh bird species, however, this AOC appears to be impaired in its ability to support a wide array of amphibian species (Table 6). Overall, this AOC is apparently not impaired in its ability to support marsh dependent species.

## Recommendations

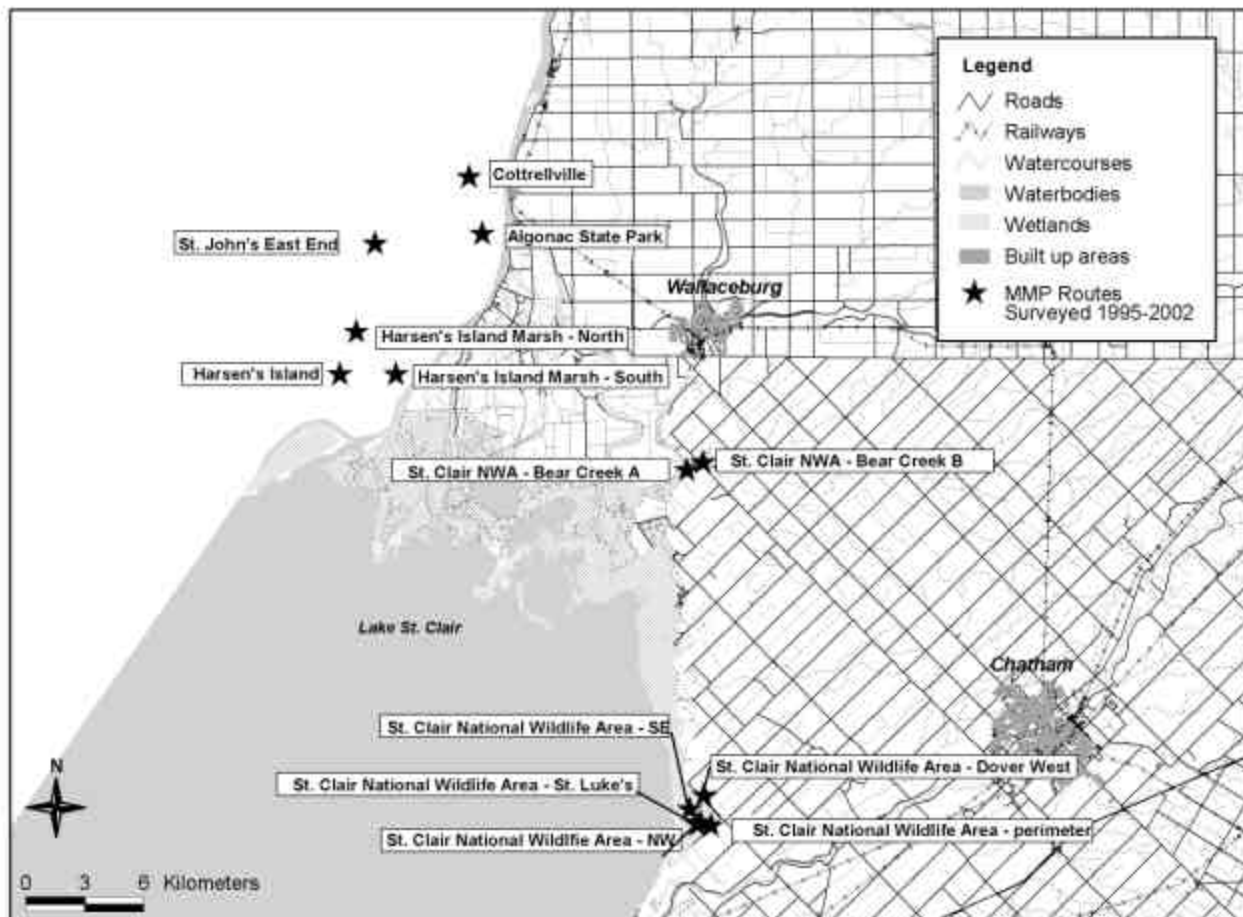
Efforts should be made to continue to rehabilitate marsh habitat and to monitor marsh bird and amphibian populations to properly address the effects of habitat loss. MMP routes should be established at all marsh rehabilitation projects. Efforts should be made to encourage MMP volunteers who survey routes within AOCs to rigorously collect habitat information at their survey stations. Complementary amphibian and marsh bird surveys should be conducted at all new existing routes to permit a more definitive quantitative analysis of this AOC's wetland-dependent wildlife.

## Volunteer Efforts

Ten participants contributed over 312 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 St. Clair River surveys: Amy Chabot, Larry Cornelis, Melisse DeDobbelee, Russell Emmonns, John Haggeman, Kathy Jones, Don Lee, Blake Mann, Mike Penner, Brian Russell.

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MMP routes in the St. Clair River AOC.

**Table 2. Marsh Monitoring Program Routes in the St. Clair River (Canada and USA) AOC.**

<b>Year</b>	<b>Route Type</b>	<b># Routes</b>	<b># Volunteers</b>
1995	Amphibian	0	0
	Bird	4	3
	Both	2	2
1996	Amphibian	0	0
	Bird	5	3
	Both	2	1
1997	Amphibian	0	0
	Bird	4	3
	Both	1	1
1998	Amphibian	0	0
	Bird	3	2
	Both	1	1
1999	Amphibian	0	0
	Bird	2	2
	Both	1	1
2000	Amphibian	0	0
	Bird	3	2
	Both	1	1
2001	Amphibian	2	1
	Bird	3	2
	Both	2	2
2002	Amphibian	1	1
	Bird	3	2
	Both	0	0
Total	Amphibian	2	2
	Bird	7	6
	Both	5	5

**Table 3. Amphibian species composition and abundance (maximum Call Level Code<sup>1</sup>) at St. Clair River (Canada and USA) AOC MMP routes from 1995 through 2002. Shading denotes indicator species.**

Amphibian Species	Harsen's Island	Harsen's Island Marsh - north	Harsen's Island Marsh - south	St. Clair N.W.A. - perimeter	St. Clair N.W.A. - SE	St. Clair N.W.A. - NW	St. Clair N.W.A. - Dover West	St. Clair River (maximum)
American Toad	2	-	1	3	2	1	3	3
Bullfrog	1	1	1	2	2	1	2	2
Chorus Frog	1	-	-	-	3	3	-	3
Gray Treefrog	1	-	-	-	2	-	-	2
Green Frog	2	1	1	2	2	1	2	2
Northern Leopard Frog	1	-	-	3	2	-	2	3
Pickerel Frog	1	-	-	-	1	1	-	1
Spring Peeper	-	-	1	1	1	-	2	2

<sup>1</sup> 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.

<sup>2</sup> N.W.A. = National Wildlife Area.

**Table 4. Marsh bird species composition and abundance (mean number per 10 stations) in the St. Clair River (Canada and USA) - AOC from 1995 through 2002. Means for St. Clair River 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 sample stations.**

Marsh Bird Species	Route Number <sup>1</sup>												St. Clair River AOC Mean	Great Lakes Basin Mean	
	1	2	3	4	5	6	7	8	9	10	11	12			
<i>Marsh Nesters</i>															
American Black Duck									p					p	0.10
American Bittern			1.3	1.3		0.8	0.7							0.39	0.64
American Coot			0.6	30.0	6.3		p				1.0			4.37	0.99
Black Tern				42.5	50.0	4.8	2.1		2.9	6.0	5.2			12.45	3.87
Blue-winged Teal								p						p	0.77
Canada Goose			5.0	5.0		p	0.7		p				p	1.20	4.56
Canvasback					2.5									0.29	0.01
Common Grackle	13.3	28.6	0.6		3.8	10.8	6.8		p	8.0	1.9		p	3.86	7.70
Common Moorhen				8.8	7.5	5.0	7.9		0.2		4.3			3.16	1.56
Common Yellowthroat	20.0	8.6	6.3	1.3		7.0	6.4		4.3	p	10.0	4.0		4.61	6.41
Eastern Kingbird		2.1		1.3	p	0.3	0.4		p				2.0	0.39	1.51
Forster's Tern		2.1				2.5	5.0		1.2		6.2	2.0		1.43	0.23
Green-winged Teal									p					p	0.15
King Rail							p				p			p	0.01
Least Bittern				1.3		2.0	3.2		p	6.0	p			0.91	0.43
Mallard		0.7	8.1	22.5	16.3	0.5	1.8	7.1	0.7	16.0	10.5	4.0		8.90	5.36
Marsh Wren	10.0		23.1	25.0	21.3	24.5	40.4	11.4	32.1	4.0	4.3			17.74	8.30
Moorhen/Coot				10.0		0.5	0.4		13.3	12.0				3.44	0.73
Mute Swan			2.5	2.5							5.2			1.11	0.66
Northern Harrier						p								p	0.09
Pied-billed Grebe		1.4	8.1	18.8	7.5	1.3	2.9	1.4	1.0	12.0	1.9			5.59	1.69
Red-winged Blackbird	110.0	53.6	51.9	66.3	62.5	71.5	60.7	62.9	48.6	12.0	25.2	32.0		53.03	44.89
Song Sparrow	3.3	8.6	1.9			0.3	1.4	1.4		2.0	1.4	26.0		3.03	5.16
Sora		1.4				0.3	0.7			4.0	0.5			0.44	1.06
Swamp Sparrow	20.0	13.6		2.5		7.0	6.4		0.7		21.0	14.0		5.65	10.13
Virginia Rail		0.7				6.5	6.4	p	2.4		2.9			1.40	3.12
Willow Flycatcher		0.7				p	p				0.5			0.07	0.54
Yellow-headed Blackbird									1.2					0.12	0.56
Yellow Warbler	13.3	12.9	1.3	2.5		1.8	0.4	2.9			1.9	20.0		3.47	6.31
<i>Water Foragers</i>															
Black-crowned Night Heron	p			p	p	p	p		0.2		p			0.02	0.42
Belted Kingfisher		1.4								p	p	2.0		0.19	0.53
Caspian Tern				1.3	6.3									0.87	0.33
Common Tern	3.3		28.1	6.3	2.5				1.0	6.0				4.95	0.84
Great Egret					p		0.4		1.9		1.0			0.31	0.47
Green Heron		2.9				0.3	0.4				p			0.12	0.52
Great Blue Heron	p	1.4	1.3	2.5	2.5	p	0.4	1.4	0.2		p	p		0.96	1.66
<i>Air Foragers</i>															
Bank Swallow							0.7		1.0	p				0.14	2.95
Barn Swallow	16.7	78.6	6.3	6.3	30.0	3.8	12.1		7.6		2.4	114.0		18.18	8.86
Chimney Swift											1.0	14.0		1.11	1.04
Common Nighthawk			4.4						1.0		p			0.60	0.27
N. Rough-winged Swallow	p	6.4												0.19	1.70
Purple Martin		5.7	26.3		3.8				0.7	18.0		8.0		5.60	1.77
Tree Swallow	30.0	116.4	8.1	136.3	100.0	4.3	10.7	12.9	7.9		16.7	154.0		48.89	32.59

<sup>1</sup> Route Name	Route Number	<sup>1</sup> Route Name	Route Number
Algonac State Park	1	St. Clair – N.W.A – Bear Creek B	7
Cottrellville	2	St. Clair – N.W.A – Dover West	8
Harsen's Island	3	St. Clair – N.W.A. – southeast	9
Harsen's Island Marsh – North	4	St. Clair – N.W.A – perimeter	10
Harsen's Island Marsh – South	5	St. Clair – N.W.A – St. Lukes	11
St. Clair – N.W.A – Bear Creek A	6	St. Clair – N.W.A – St. John's East	12

**Table 5. Status assessment of marsh bird and amphibian indicator species abundance in the St. Clair River (Canada and USA) AOC from 1995 through 2002. ' - ' 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. 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
Algonac State Park								0									
Cottrellville										0	0	0					
Harsen's Island	0	0						+	0	+			+	-		0	
Harsen's Island Marsh - North	0	+	+		+		0	+	+	+			+				
Harsen's Island Marsh - South		+	+		0			+	+	+			0				-
St. Clair - N.W.A. - Bear Creek A																	
St. Clair - N.W.A. - Bear Creek B	0		0		+		+	+	+	+	0	+					
St. Clair - N.W.A. - Dover West					p			+		0		p	+			+	
St. Clair - N.W.A. - southeast			+		-			+	+	0		0	0	0		0	-
St. Clair - N.W.A. - northwest													+	+			
St. Clair - N.W.A. - perimeter			0				+	0	+	+	0						
St. Clair - N.W.A.- St. Luke's		0	+		+		p	0	+	0	0	0	+			+	
St. John's East End																	
<b>St. Clair River Overall Assessment</b>	-	-	0	p	-		-	0	0	0	-	-	+	0		+	-

**Table 6. Status of St. Clair River (Canada and USA) marshes from 1995 to 2002<sup>1</sup>. ' - ' 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 <sup>2</sup>	Survey Type	Year	Number of Stations	Assessment of Marsh Bird and Amphibian Species Diversity				Overall Assessment <sup>3</sup>
				Marsh Nesting Bird Diversity	Marsh Bird Indicator Species Diversity	Amphibian Species Diversity	Amphibian Indicator Species Diversity	
Algonac State Park C, Medium	Bird	1995	3	+	-			2
Cottrellville C, Medium	Bird	1996 - 2002	2	0	-			1
Harsen's Island C, Huge	Amph Bird	2001 - 2002	8 8	-	+	0	-	3
Harsen's Island Marsh - North C, Huge	Amph Bird	1996	8 7	+	+	-	-	4
Harsen's Island Marsh - South C, Huge	Amph Bird	1996	8 8	-	+	-	-	2
St. Clair - N.W.A. - Bear Creek A I, Huge	Bird	1995 - 2002	5	0	0			2
St. Clair - N.W.A. - Bear Creek B I, Huge	Bird	1995 - 1998, 2000 - 2002	4	+	+			4
St. Clair - N.W.A. - southeast I, Tiny	Amph Bird	1995 - 2001	7 7	-	+	-	-	2
St. Clair - N.W.A. - northwest I, Tiny	Amph	2001	7			0	0	2
St. Clair - N.W.A. - perimeter C, Tiny	Amph Bird	2001 - 2002	5 5	+	+	+	-	6
St. Clair - N.W.A. -St. Luke's C, P, Tiny	Bird	1995 - 1997	7	+	0			3
St. John's East End C, P, Large	Bird	1996	5	-	-			0
<b>St. Clair River Overall Assessment</b>				<b>0</b>	<b>+</b>	<b>-</b>	<b>-</b>	<b>3</b>

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

<sup>2</sup> 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).

<sup>3</sup> 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.