

Marsh Bird and Amphibian Communities in the Thunder Bay 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 Thunder Bay 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 Thunder Bay 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 Thunder Bay 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 Thunder Bay AOC marshes.

Birds

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

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

- Since the program's initiation, three marsh bird routes have been monitored in the Thunder Bay AOC. During the period from 1996 through 2002, the number of routes surveyed and number of volunteers were stable, but low.
- Overall, 23 species of marsh nesters were recorded in the Thunder Bay AOC – a high level of diversity. Further, six (Black Tern, Blue-winged Teal, Common Moorhen, Common Snipe, Marsh Wren, Sora) of 12 marsh bird indicator species were recorded in the Thunder Bay AOC. Marsh Wren was the most abundant nesting species, followed by Canada Goose, Song Sparrow and Alder Flycatcher. Great Blue Heron was the most abundant water forager species and Tree Swallow was the most abundant aerial forager.
- Abundance of one marsh bird indicator species (Blue-winged Teal) occurring in the Thunder Bay AOC scored above the average, and two marsh bird indicator species (Marsh Wren and Sora) scored below the average of those at Great Lakes basin non-AOC routes. Three marsh indicator species (Black Tern, Common Moorhen, Common Snipe) were recorded only outside of MMP station boundaries .

- Thunder Bay marsh bird indicator species diversity and marsh nesting bird species diversity scored below the average of Great Lakes basin non-AOC routes. The Thunder Bay AOC apparently is impaired in its ability to support a high diversity of marsh bird species. Overall, this AOC is apparently 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 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 Thunder Bay AOC

Since the program's initiation, three marsh bird routes have been monitored in the Thunder Bay AOC. During the period from 1996 through 2002, number of routes surveyed and number of volunteers were stable, but low.

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

To become involved, please contact the MMP Volunteer Coordinator, Bird Studies Canada at (888) 448-2473 (phone), (519) 536-3532 (fax), or by email at aqsurvey@bsc-eoc.org.

Results

The only marsh monitored with habitat data recorded in the Thunder Bay AOC was tiny in size and coastal, thus affected by fluctuations in Lake Superior water levels. This marsh has also been classified as a site of habitat rehabilitation.

Number of marsh nesters at Thunder Bay AOC routes ranged from nine to 22 (Table 3). In total, 23 species of marsh nesters were recorded in the Thunder Bay AOC – a high level of diversity. Further, six (Black Tern, Blue-winged Teal, Common Moorhen, Common Snipe, Marsh Wren, Sora) of 12 marsh bird indicator species were recorded in the Thunder Bay AOC. According to the Ontario Breeding Bird Atlas database, several of the marsh bird indicator species (Black Tern, Common Moorhen, Marsh Wren and Virginia Rail) are apt to be absent or quite thinly scattered in the Northern part of the Great lakes basin; only American Bittern, American Coot, Blue-winged Teal, Common Snipe, Pied-billed Grebe and Sora are expected in this AOC. Densities for 15 of 23 marsh nesting

species were higher at Thunder Bay routes than at Great Lakes basin non-AOC routes. Marsh Wren was the most abundant nesting species, followed by Canada Goose, Song Sparrow and Alder Flycatcher.

Three water foragers and four aerial foragers were recorded in the Thunder Bay AOC – a moderate level of diversity (Table 3). Great Blue Heron was the most abundant water forager species and Tree Swallow was the most abundant aerial forager. Densities were higher at Thunder Bay routes than at Great Lakes basin non-AOC routes for one (Great Blue Heron) of three water foraging species. Densities of all aerial foragers were lower at Thunder Bay routes than at Great Lakes basin non-AOC routes.

Conclusions

Abundance of one marsh bird indicator species (Blue-winged Teal) occurring in the Thunder Bay AOC scored above the average, and two marsh bird indicator species (Marsh Wren and Sora) scored below the average of those at Great Lakes basin non-AOC routes. Three marsh indicator species (Black Tern, Common Moorhen, Common Snipe) were recorded only outside of MMP station boundaries (Table 4).

Thunder Bay marsh bird indicator species diversity and marsh nesting bird species diversity scored below the average of Great Lakes basin non-AOC routes (Table 5). The Thunder Bay AOC apparently is impaired in its ability to support a high diversity of marsh bird species. Overall, this AOC is apparently impaired in its ability to support marsh dependent species, however, monitoring of more routes in this AOC is required to make a more definitive assessment.

Recommendations

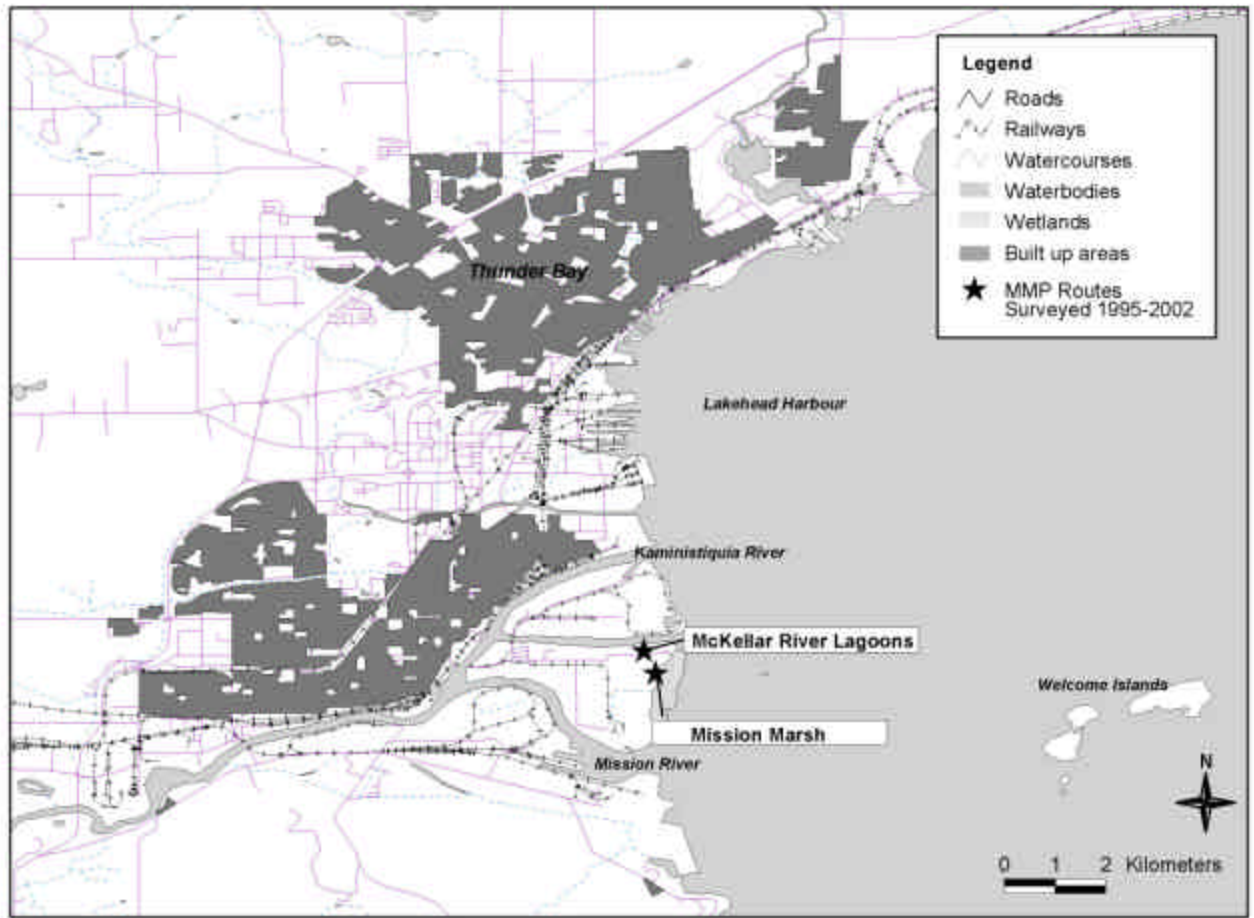
Efforts should be made to continue to rehabilitate marsh habitat and to monitor marsh bird and amphibian populations to properly address the effects of habitat loss. MMP routes should be established at all marsh rehabilitation projects. Efforts should be made to encourage all MMP volunteers surveying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

Volunteer Efforts

One participant contributed over 120 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 Susan Bryan who conducted all the Thunder Bay surveys.

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Prepared by: Bird Studies Canada, P.O. Box 160, Port Rowan, Ontario, N0E 1M0 www.bsc-eoc.org August 2003.



MMP routes in the Thunder Bay AOC.

Table 2. Marsh Monitoring Program Routes in the Thunder Bay AOC.

Year	Route Type	# Routes	# Volunteers
1995	Amphibian	0	0
	Bird	1	1
	Both	0	0
1996	Amphibian	0	0
	Bird	2	1
	Both	0	0
1997	Amphibian	0	0
	Bird	2	1
	Both	0	0
1998	Amphibian	0	0
	Bird	2	1
	Both	0	0
1999	Amphibian	0	0
	Bird	2	1
	Both	0	0
2000	Amphibian	0	0
	Bird	2	1
	Both	0	0
2001	Amphibian	0	0
	Bird	2	1
	Both	0	0
2002	Amphibian	0	0
	Bird	2	1
	Both	0	0
Total	Amphibian	0	0
	Bird	2	1
	Both	0	0

Table 3. Marsh bird species composition and abundance (mean number per 10 stations) in the Thunder Bay AOC from 1995 through 2002. Means for Thunder Bay 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	McKellar River Lagoons	Mission Marsh	Thunder Bay AOC Mean	Great Lakes Basin Mean
<i>Marsh Nesters</i>				
American Black Duck		6.5	4.64	0.10
Alder Flycatcher	19.3	20.8	20.33	0.34
American Wigeon		3.5	2.50	0.02
Black Tern		p	p	3.87
Blue-winged Teal	1.4	3.0	2.55	0.77
Canada Goose	145.7	25.8	60.03	4.56
Common Grackle		0.3	0.18	7.70
Common Moorhen		p	p	1.56
Common Snipe		p	p	0.38
Common Yellowthroat	2.9	15.3	11.71	6.41
Gadwall	1.4		0.41	0.12
Green-winged Teal		7.8	5.54	0.15
Lincoln's Sparrow		1.0	p	0.01
Mallard	22.1	83.5	0.71	5.36
Marsh Wren		0.3	65.97	8.30
Northern Harrier		0.5	0.18	0.09
Northern Shoveler		3.5	0.36	0.08
Ring-necked Duck		0.5	2.50	0.40
Red-winged Blackbird	p	7.8	5.54	44.89
Song Sparrow	35.7	28.5	30.56	5.16
Sora		0.5	0.36	1.06
Swamp Sparrow		18.8	13.39	10.13
Yellow Warbler	5.7	21.3	16.81	6.31
<i>Water Foragers</i>				
Belted Kingfisher		0.5	0.36	0.53
Common Tern		1.0	0.71	0.84
Great Blue Heron	7.1	5.8	6.15	1.66
<i>Air Foragers</i>				
Barn Swallow	1.4	1.3	1.30	8.86
Chimney Swift		0.3	0.18	1.04
Cliff Swallow	p		p	0.25
Tree Swallow	8.6	15.3	13.34	32.59

Table 4. Status assessment of marsh bird and amphibian indicator species abundance in the Thunder Bay - 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
McKellar River Lagoons				0													
Mission Marsh			p	+	p	p		-			0						
Thunder Bay Overall Assessment			p	+	p	p		-			-						

Table 5. Status of Thunder Bay 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	
McKellar River Lagoons <i>R, C, Tiny</i>	Bird	1996 - 2002	2	-	-			0
Thunder Bay 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. 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.