

Marsh Bird and Amphibian Communities in the Nipigon 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 Nipigon 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 Nipigon 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 Nipigon 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 Nipigon River AOC marshes.

Birds

- T** American Bittern (AMBI)
- American Coot (AMCO)
- Black Tern (BLTE)
- T** Blue-winged Teal (BWTE)
- Common Moorhen (COMO)
- Common Snipe (COSN)
- T** Least Bittern (LEBI)
- Marsh Wren (MAWR)
- C. Moorhen/ A.Coot (MOOT)
- T** Pied-billed Grebe (PBGR)
- T** Sora
- Virginia Rail (VIRA)

Amphibians

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

- Since the program's initiation one route surveyed for both amphibians and marsh birds has been established in the Nipigon Bay AOC. However, this route was not monitored in 1999, 2001 and 2002.
- Only two amphibian species were recorded in the Nipigon Bay – AOC, including one amphibian indicator species (Spring Peeper). Species were recorded at moderate to high levels (Call Level Codes 2 and 3).
- Overall, 14 species of marsh nesters were recorded in the Nipigon Bay AOC – a moderate level of diversity. Further, five (American Bittern, Blue-winged Teal, Least Bittern, Pied-billed Grebe, Sora) of 12 marsh bird indicator species were recorded in the Nipigon Bay AOC. Song Sparrow was the most abundant nesting species, followed by Canada Goose, Swamp Sparrow and Mallard. One water forager and three aerial foragers were recorded in the Nipigon Bay AOC – a low level of diversity.
- Relative occurrence of the only amphibian indicator species present in the Nipigon Bay AOC (Spring Peeper) scored above the average of those at Great Lakes basin non-AOC routes. Abundance of three of five marsh indicator species (Blue-winged Teal, Least Bittern, Sora) occurring in the Nipigon Bay scored within the average of those at Great Lakes basin non-

AOC routes. However, American Bittern and Pied-billed Grebe were present only outside of MMP sample station boundaries.

- Marsh bird indicator species diversity and marsh nesting bird species diversity in the Nipigon Bay 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 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 Nipigon Bay AOC

Since the program's initiation one route surveyed for both amphibians and marsh birds has been established in the Nipigon Bay AOC. However, this route was not monitored in 1999, 2001 and 2002.

A number of habitat rehabilitation projects have been proposed in the Nipigon 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) 586-3532 (fax), or by email at aqsurvey@bsc-eoc.org.

Results

The only marsh monitored in the Nipigon Bay AOC was large in size and coastal, thus the marsh was affected by fluctuations in Lake Superior water levels.

Only two amphibian species were recorded in the Nipigon Bay AOC (Table 3), including one amphibian indicator species (Spring Peeper). According to the Ontario Herpetofaunal Summary, only one amphibian indicator species (Spring Peeper) has occurred in this AOC. Species call codes were recorded at moderate to high levels (Call Level Codes 2 and 3).

Overall, 14 species of marsh nesters were recorded in the Nipigon Bay AOC – a moderate level of diversity (Table 4). Further, five (American Bittern, Blue-winged Teal, Least Bittern, Pied-billed Grebe, Sora) of 12 marsh bird indicator species were recorded in the Nipigon Bay AOC. According to the Ontario Breeding Bird Atlas database, no marsh bird indicator species have occurred in this AOC. Densities for six of 14 marsh nesting species were higher at Nipigon Bay routes than at Great Lakes basin non-AOC routes. Song Sparrow was the most abundant nesting species, followed by Canada Goose, Swamp Sparrow and Mallard.

One water forager and three aerial foragers were recorded in the Nipigon Bay AOC – low levels of diversity (Table 4). Tree Swallow was the most abundant aerial forager. Densities were lower at Nipigon Bay routes than at Great Lakes basin non-AOC route averages for all three aerial foraging species.

Conclusions

Relative occurrence of the only amphibian indicator species present in the Nipigon Bay AOC (Spring Peeper) scored above the average of those at Great Lakes basin non-AOC routes (Table 5). Abundance of three of five marsh indicator species (Blue-winged Teal, Least Bittern, Sora) occurring in the Nipigon Bay scored within the average of those at Great Lakes basin non-AOC routes. However, American Bittern and Pied-billed Grebe were present only outside of MMP sample station boundaries.

Marsh bird indicator species diversity and marsh nesting bird species diversity in the Nipigon Bay AOC scored below the average of those at Great Lakes basin non-AOCs (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 Nipigon Bay 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 needed to make a more definitive assessment.

Recommendations

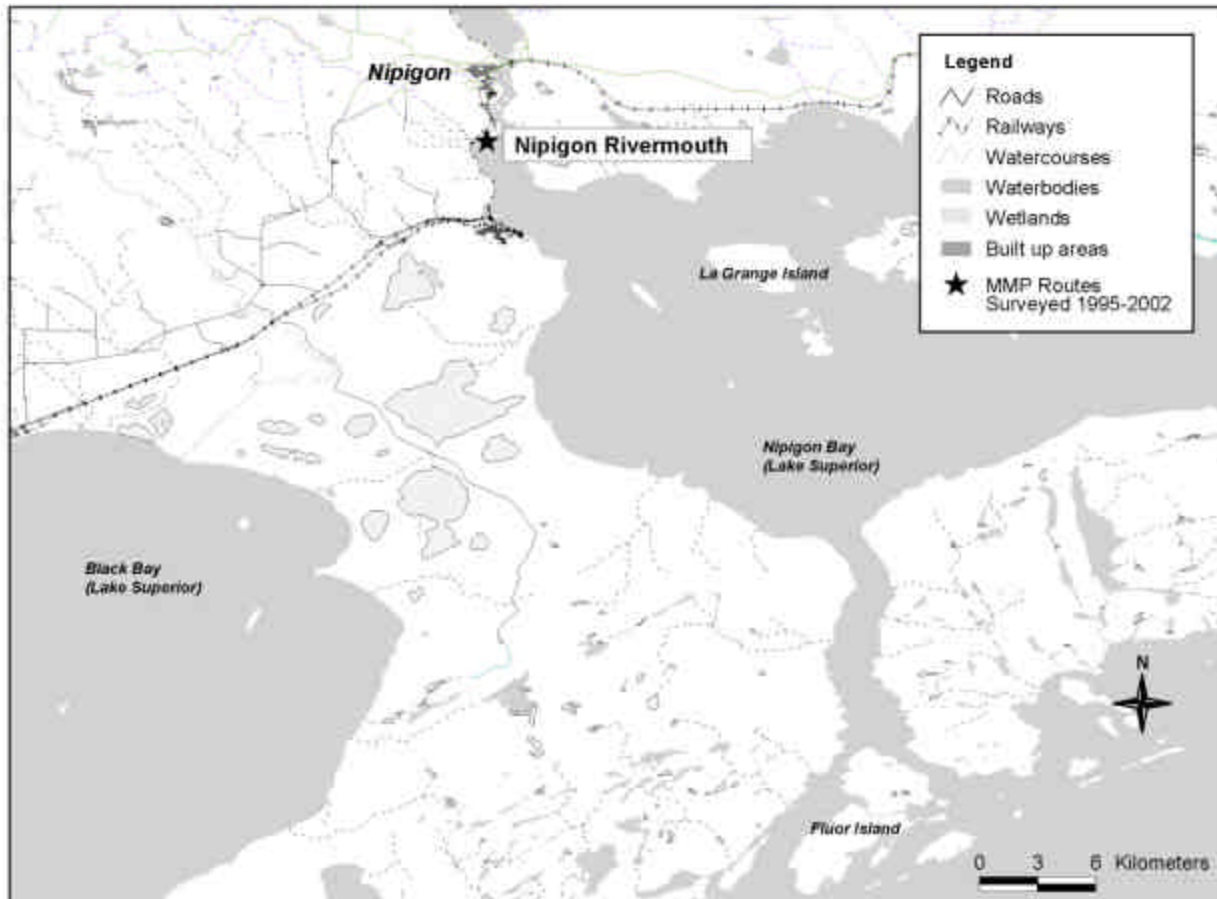
Efforts should be made to continue to rehabilitate marsh habitat and to monitor marsh bird and amphibian populations to properly address the effects of habitat loss. MMP routes should be established at all marsh rehabilitation projects. Efforts should be made to encourage all MMP volunteers surveying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

Volunteer Efforts

One participant contributed over 40 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 Robert Swainson who conducted the Nipigon Bay surveys.

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MMP routes in the Nipigon Bay AOC.

Table 2. Marsh Monitoring Program Routes in the Nipigon Bay 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	0	0
	Both	0	0
2000	Amphibian	0	0
	Bird	0	0
	Both	1	1
2001	Amphibian	0	0
	Bird	0	0
	Both	0	0
2002	Amphibian	0	0
	Bird	0	0
	Both	0	0
Total	Amphibian	0	0
	Bird	0	0
	Both	1	1

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

Amphibian Species	Nipigon Rivermouth	Nipigon River AOC (maximum)
American Toad	2	2
Bullfrog	-	-
Chorus Frog	-	-
Gray Treefrog	-	-
Green Frog	-	-
Northern Leopard Frog	-	-
Spring Peeper	3	3
Wood Frog	-	-

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 Nipigon Bay AOC from 1995 through 2002. Means for Nipigon 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	Nipigon Rivermouth	Nipigon River AOC Mean	Great Lakes Basin Mean
<i>Marsh Nesters</i>			
American Black Duck	0.5	0.5	0.10
Alder Flycatcher	1.0	1.0	0.34
American Bittern	p	p	0.64
Blue-winged Teal	0.5	0.5	0.77
Canada Goose	10.5	10.5	4.56
Common Yellowthroat	5.5	5.5	6.41
Least Bittern	0.5	0.5	0.43
Mallard	8.0	8.0	5.36
Pied-billed Grebe	p	p	1.69
Red-winged Blackbird	6.5	6.5	44.89
Song Sparrow	13.5	13.5	5.16
Sora	1.0	1.0	1.06
Swamp Sparrow	8.5	8.5	10.13
Yellow Warbler	6.0	6.0	6.31
<i>Water Foragers</i>			
Great Blue Heron	3.5	3.5	1.66
<i>Air Foragers</i>			
Bank Swallow	0.5	0.5	2.95
Barn Swallow	3.0	3.0	8.86
Tree Swallow	9.0	9.0	32.59

Table 5. Status assessment of marsh bird and amphibian indicator species abundance in the Nipigon 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
Nipigon Rivermouth	p			0			0			p	0						+
Nipigon River Overall Assessment	p			0			0			p	0						+

Table 6. Status of Nipigon Bay marshes from 1995 to 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.

Route Name ²	Survey Type	Year	Number of Stations	Assessment of Marsh Bird and Amphibian Species Diversity				
				Marsh Nesting Bird Diversity	Marsh Bird Indicator Species Diversity	Amphibian Species Diversity	Amphibian Indicator Species Diversity	Overall Assessment ³
Nipigon Rivermouth C, Large	Amph Bird	1995 - 1998, 2000	4 4	-	-	-	-	0
Nipigon River 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.