

# STATE OF THE STRAIT MONITORING FOR SOUND MANAGEMENT



## A BINATIONAL CONFERENCE ON THE DETROIT RIVER ECOSYSTEM

Convened December 2004 by Great Lakes Institute for Environmental Research, University of Windsor, The Greater Detroit American Heritage River Initiative of Metropolitan Affairs Coalition, The Detroit River Canadian Cleanup, The Detroit River International Wildlife Refuge, The Detroit Water and Sewerage Department, and other organizations.

**Cover photos:** photos left and center (upper and lower): Recreational fishing in the Huron-Erie Corridor (lower center photo by Kurt Byers, Michigan Sea Grant Extension, courtesy of United States Environmental Protection Agency, Great Lakes National Program Office; other photos courtesy of OMNR); upper right: Scientist sampling water, benthic invertebrates and sediment in Lake Erie (photo courtesy of Environment Canada and University of Windsor); lower right: Longear sunfish (*Lepomis megalotis*) (photo courtesy of Nicolas Lapointe)

STATE OF THE STRAIT  
MONITORING FOR SOUND MANAGEMENT

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## 6.12. THE MARSH MONITORING PROGRAM: MONITORING ECOLOGICAL INTEGRITY OF WETLANDS IN GREAT LAKES AREAS OF CONCERN

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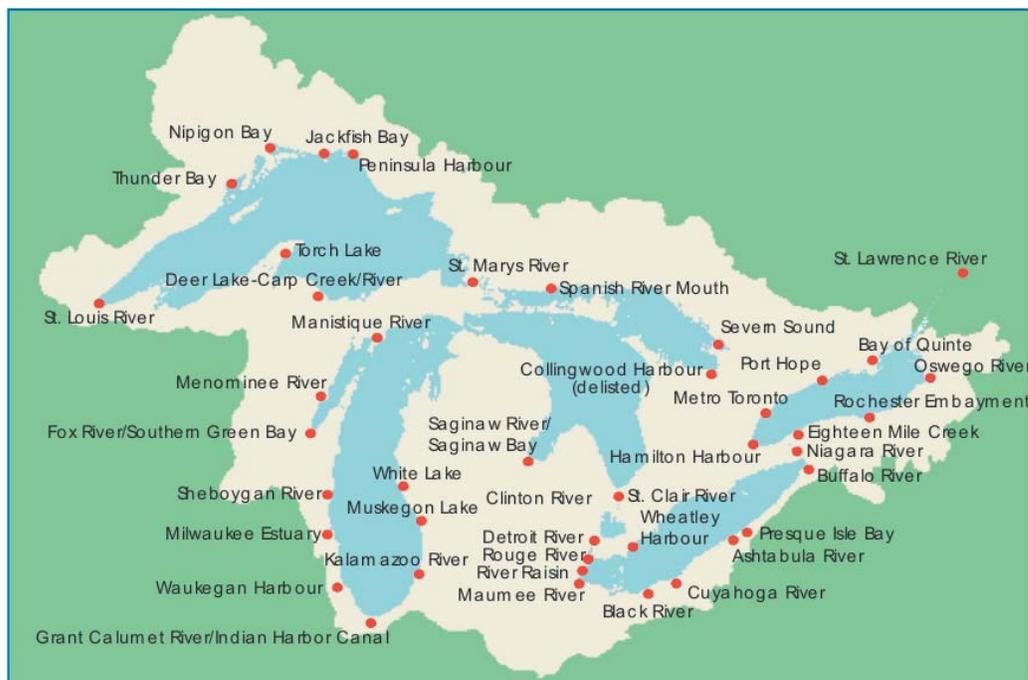


Figure 1. Areas of Concern within the Great Lakes basin.

### Introduction

In 1987, the Great Lakes Water Quality Agreement (GLWQA) committed the governments of Canada and the United States to develop and implement remedial action plans (RAPs) in 43 Areas of Concern (AOCs) as shown in Figure 1. These RAPs address pollution and other problems associated with 14 Beneficial Use Impairments (BUIs) in or near shore and open lake waters. The BUIs relate to the health of wildlife and their human consumers, nutrient and other pollution inputs, and economic and aesthetic impacts (Great Lakes Water Quality Board 1997).

In response to the GLWQA, and to apparent marsh bird and amphibian population declines, the Marsh Monitoring Program (MMP) was established as a binational Great Lakes basin-wide effort to monitor marsh bird and calling amphibian populations (Green 1997). To this end a partnership was formed by Bird Studies Canada, the U.S. Environmental Protection Agency, Environment Canada, Great Lakes United, the Great Lakes Protection Fund, and hundreds of citizen scientists. Although the main goal of the MMP is to monitor populations of birds and amphibians throughout the Great Lakes basin, it also seeks to compare bird and amphibian species composition, abundance, and diversity between AOC and non-AOC marshes; to assess AOC status with respect to wildlife values; and to determine species-habitat associations. Through public participation, the MMP also helps increase understanding and stewardship of wetlands.

## Methods

To survey marsh habitats, MMP volunteers follow a standardized protocol and are guided by detailed written and aural training materials. Surveys are conducted at up to eight semi-circular monitoring stations positioned along routes. At each station, a three-minute nocturnal calling amphibian survey is conducted three times during the breeding season, and a ten-minute evening marsh bird survey is conducted twice during the height of their breeding season. Taped broadcasts are used to elicit response calls from several secretive marsh bird species. MMP participants also provide assessments of wetland habitat at each survey station. On average, 240 MMP routes were surveyed each year since 1995. In the Detroit River AOC, volunteers have monitored one amphibian route, three marsh bird routes and two routes surveyed for both amphibians and marsh birds (Figure 2). Each station location was geo-referenced to the position of the route using a Global Positioning System (GPS).

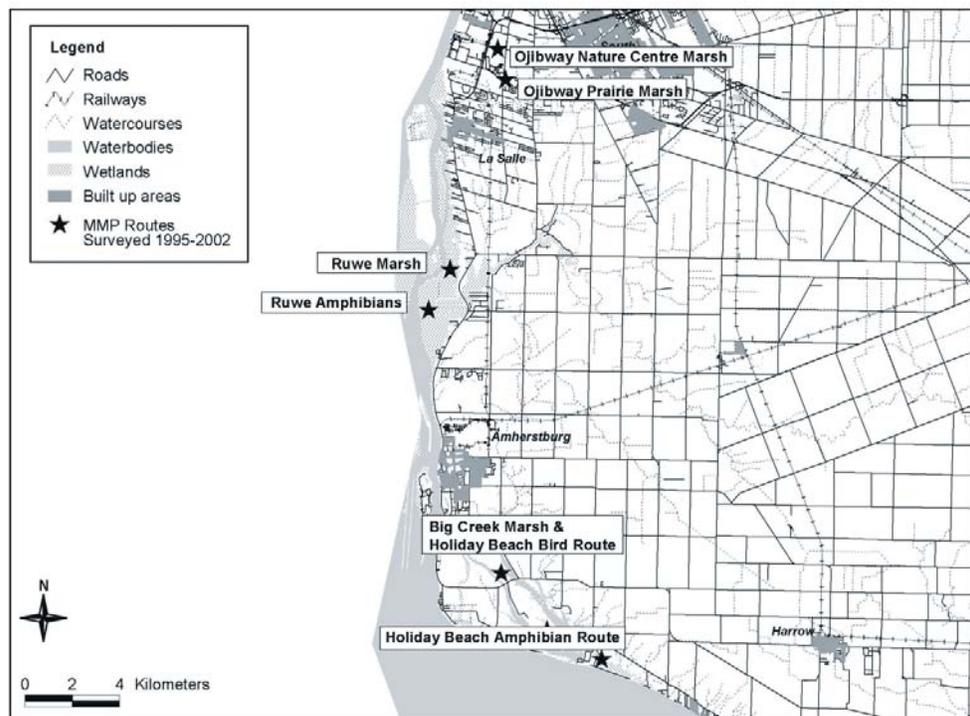


Figure 2. Locations of MMP routes in the Detroit River Area of Concern.

In order to assess AOC marshes, the following four measures of species diversity were calculated and compared with non-AOC marshes: diversity of all marsh nesting birds, diversity of all amphibian species, diversity of marsh bird indicator species only, and diversity of amphibian indicator species only (see Timmermans et al. 2003 for indicator species list). A ranking system was developed (Timmermans et al. 2003) to score wetlands on these diversity measures relative to non-AOC wetlands. Results in this report focus on the Detroit River AOC.

## Results

Throughout the Detroit River AOC, seven amphibian species were recorded, including four of the five indicator species (Table 1). All amphibian species were recorded at low levels except at Holiday Beach, where they were recorded at moderate to high levels. Total amphibian species diversity and amphibian indicator species diversity scored within the average of those at Great Lakes Basin non-AOC routes (Table 2).

For marsh nesting birds, 16 species were recorded in the Detroit River AOC, but only five of the 12 indicator species were among those recorded (Table 1). Overall, marsh bird indicator species and marsh nesting bird diversity in the Detroit River AOC scored below the average of those at Great Lakes basin non-AOC routes (Table 2). The Detroit River AOC had an overall score of two, indicating impairment in its ability to support marsh-dependent species (Table 2).

**Table 1.** Status assessment of marsh bird and amphibian indicator species abundance in the Detroit River (Canada and USA) AOC from 1995 through 2002<sup>1</sup>.

Route Name	Marsh Bird Indicator Species <sup>2</sup>														Amphibian Indicator Species <sup>3</sup>			
	AMBI	AMCO	BLTE	BWTE	COMO	COSN	LEBI	MAWR	MOOT	PBGR	SORA	VIRA	BULL	CHFR	MIFR	NLFR	SPPE	
Big Creek Marsh, Holiday Beach								0			0							
Holiday Beach																		
Ojibway Nature Center Marsh																		
Ojibway Prairie Marsh																		
Ruwe Marsh				p							0							
<b>Overall Assessment</b>				p							-							

<sup>1</sup> Overall assessment:

- = below Great Lakes basin non-AOC average.
- + = above Great Lakes basin non-AOC average.
- 0 = within Great Lakes basin non-AOC average.
- blank = species not present.
- p = species present outside sample stations.

<sup>2</sup>

= Marsh Wren; MOOT = combined Moorhen/Coot; PBGR = Pied-billed Grebe; SORA = Sora; VIRA = Virginia Rail.

<sup>3</sup> BULL = Bullfrog; CHFR = Chorus Frog; MIFR = Mink Frog; NLFR = Northern Leopard Frog; SPPE = Spring Peeper.

**Table 2.** Status of Detroit River (Canada and USA) marshes from 1995 to 2002<sup>1</sup>.

Route Name	Survey Type	Year	Number of Stations	Assessment of Marsh Bird and Amphibian Species Diversity <sup>2</sup>				Overall Assessment <sup>3</sup>
				Marsh Nesting Bird Diversity	Marsh Bird Indicator Species Diversity	Amphibian Species Diversity	Amphibian Indicator Species Diversity	
Big Creek Marsh and Holiday Beach	Bird	2000 - 2002	6	-			0	
Holiday Beach	Amphibian	1999 - 2001	4			+	4	
Ruwe Marsh	Bird	1995 - 1999	3	-			0	
Ruwe Marsh Amphibians	Amphibian	1996	1			-	0	
<b>Overall Assessment</b>				-	-	0	2	

<sup>1</sup> See Weeber et al. (1997) for a detailed description of the scoring system.

<sup>2</sup> Assessment scores:

- = below Great Lakes basin non-AOC average.

+ = above Great Lakes basin non-AOC average.

0 = within Great Lakes basin non-AOC average.

blank = species not present.

<sup>3</sup> 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.

## Conclusions and Future Work

Despite the dedication of many volunteers to monitor AOC wetlands, monitoring coverage in many AOCs has been poor and in decline. Given the limited number of routes and years surveyed, reliable species trends over time could not be determined. Bird Studies Canada and the Great Lakes Commission are currently working with the U.S. EPA and others to improve approaches for monitoring wetland habitats in AOCs and reporting on ecological integrity in response to remedial activities in degraded environments.

The specific goals of this partnership are to improve the coverage and coordination of long-term wetland monitoring in U.S. and binational AOCs; to develop improved means of reporting on the status of five Beneficial Use Impairments (BUIs) (i.e., degradation of wildlife populations, loss of fish and wildlife habitat, degradation of benthos, eutrophication or undesirable algae, and degradation of aesthetics); and to strengthen ties between RAPs and monitoring initiatives in the Great Lakes basin. This work will involve intensive recruitment of volunteers and additional sampling of benthos and water quality at the AOCs under investigation. Ultimately, the program will help develop effective restoration strategies and measure their success in terms of marsh bird and amphibian related BUIs, thereby contributing to the recovery specific AOCs.

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