

Acknowledgements

The Lake Erie Lakewide Management Plan (LaMP) Work Group, under the direction of the Lake Erie LaMP Management Committee, prepared the Lake Erie LaMP 2002 Report. Environment Canada and the U.S. Environmental Protection Agency are the federal co-leads for the Lake Erie LaMP. The other agencies playing an active role in the process are:

Canada

- o Fisheries and Oceans Canada
- o FOCALerie (Federation of Conservation Authorities of Lake Erie)
- o Health Canada
- o Ontario Ministry of Agriculture, Food and Rural Affairs
- o Ontario Ministry of the Environment
- o Ontario Ministry of Natural Resources

United States

- o Agency for Toxic Substances and Disease Registry
- o Michigan Department of Environmental Quality
- o Michigan Department of Natural Resources
- o Natural Resource Conservation Service
- o New York State Department of Environmental Conservation
- o Ohio Department of Natural Resources
- o Ohio Environmental Protection Agency
- o Pennsylvania Department of Environmental Protection
- o U.S. Fish and Wildlife Service
- o U.S. Geological Survey

Binational

- o Great Lakes Fisheries Commission

Photo: Black Swamp Bird Observatory, Oak Harbor, Ohio



Members of the Work Group, Management Committee, technical subcommittees, and the Binational Public Forum contributed to the content of this report. The Work Group would like to specifically thank the following individuals:

- o **Environment Canada** - Madeline Austen, Hans Biberhofer, Murray Charlton, Ken De, Sandra George, Bob Krawl, Marlene O'Brien, Scott Painter, Jeff Robinson, Jennifer Vincent, Alan Waffle, Chip Weseloh and Karen Yang;
- o **U.S. Environmental Protection Agency** - Paul Bertram, Sue Brauer, Alexis Cain, Tony Martig, Francine Norling, Dan O'Riordan, John Perrecone and Holly Wirick;
- o **FOCALerie** - Ted Briggs, Matthew Child and Barb Veale;
- o **U.S. Geological Survey** - Mike Bur, Dan Button and Donna Myers;
- o **Pennsylvania Department of Environmental Protection** - Kelly Burch;
- o **University of Windsor** - Jan Ciborowski and Lynda Corkum;
- o **Ontario Ministry of the Environment** - Al Hayton and Gary Johnson;
- o **Ohio Department of Natural Resources** - Roger Knight and Mark Shieldcastle;
- o **Ohio Environmental Protection Agency** - Julie Letterhos, Kelvin Rogers and Roger Thoma;
- o **Michigan Department of Environmental Quality** - Arthur Ostaszewski;
- o **Ontario Ministry of Agriculture, Food and Rural Affairs** - Peter Roberts;
- o **Ontario Ministry of Natural Resources** - Phil Ryan;
- o **Bird Studies Canada** - Steve Timmermans and Kerry Wilcox; and
- o **New York Department of Environmental Conservation** - Robert Townsend.

Thanks to the Upper Thames River Conservation Authority for providing support on formatting and printing the report, and for showing utmost patience in dealing with last minute changes.

Finally, the Work Group would like to thank Julie Letterhos, Ohio EPA, and Jennifer Vincent, Environment Canada, who served as co-editors for the Lake Erie LaMP 2002 Report.

In keeping with the spirit of binational cooperation, the reader will note the alternation between Canadian and U.S. preferred spellings on a number of occasions.

Table of Contents

Acknowledgements	i
Table of Contents	iii
Lists of Figures and Tables	v
Section 1: Introduction	1
Section 2: Ecosystem Management Objectives	3
2.1 Ecosystem Alternative Selection	3
2.2 Selection of Ecosystem Management Objectives	4
2.3 Indicators	8
Section 3: Beneficial Use Impairments Update	9
3.1 Introduction	9
3.2 Degraded Wildlife Populations and Loss of Wildlife Habitat	11
3.3 Next Steps	14
3.4 Fish BUIA Update	15
Section 4: A Habitat Strategy for Lake Erie	17
4.1 Introduction	17
4.2 Habitat Strategy Development	17
4.3 Agricultural Non-point Source Runoff	18
4.4 Urban and Development Land Use Controls	21
4.5 Habitat Preservation	21
4.6 Habitat Restoration	21
4.7 Exotic Species Control	22
4.8 Bioregional Strategic and Management Planning	23
4.9 Upcoming Habitat Events	24
Section 5: Sources and Loads Update	25
5.1 Introduction	25
5.2 Mercury and PCB Reduction Initiatives	29
5.3 U.S. EPA Mercury Phase-out Proposal	29
Section 6: Human Health	35
Section 7: Public Involvement	37
Section 8: Assessment and Tracking Progress	39
8.1 Introduction	
8.2 The Lake Erie Millennium Plan	39
8.3 Marsh Monitoring Program	40
8.4 Trends in Contaminants in Ontario's Lake Erie Sport Fish	43
8.5 Trends in Contaminant and Population Levels of Colonial Waterbirds	48
8.6 Ohio Lake Erie Quality Index	50
8.7 U.S. EPA LaMP Project Tracking Database	51
8.8 U.S. EPA GIS Tool to Characterize Landscapes Based on Ecosystem Health	51
8.9 State of the Lakes Ecosystem Conference (SOLEC)	51

Section 9: Remedial Action Plan Updates	53
9.1 Introduction	53
9.2 Buffalo River RAP	54
9.3 Presque Isle Bay RAP	54
9.4 Ashtabula River RAP	55
9.5 Cuyahoga River RAP	56
9.6 Black River RAP	56
9.7 Maumee River RAP	57
9.8 River Raisin RAP	58
9.9 Rouge River RAP	58
9.10 Detroit River RAP	59
9.11 Wheatley Harbour RAP	60
9.12 Clinton River RAP	61
9.13 St. Clair River RAP	62
Section 10: Significant Ongoing and Emerging Issues	63
10.1 Introduction	63
10.2 Update on Non-indigenous Invasive Species in Lake Erie	63
10.3 Botulism E	67
10.4 Phosphorus Changes in Lake Erie	68
10.5 Double Crested Cormorants in the Great Lakes	69
10.6 Lake Erie Water Levels	70
Section 11: Pathways to Achievements/Next Steps	73
Section 12: References	75



Photo: Upper Thames River Conservation Authority

List of Figures

Figure 1:	Total PCBs in Bed Sediments	26
Figure 2:	Total Mercury in Bed Sediments	27
Figure 3:	Surficial Sediment Concentrations of Dioxin (pg/g TEQ)	28
Figure 4:	Lake Erie Basin-wide Trends in Relative Abundance of Selected Marsh Bird and Amphibian Species Compared to Mean Annual Water Levels of Lake Erie from 1995 to 2000	41
Figure 5:	Lake Erie Blocks	43
Figure 6:	Mercury Concentrations in 30 cm (12 inch) White Bass Across Lake Erie 1990-2000	44
Figure 7:	Mercury Concentrations in 45 cm (18 inch) Walleye Across Lake Erie 1990-2000	44
Figure 8:	Mercury Concentrations in 30 cm (12 inch) White Bass Over Time in Lake Erie Block 1	45
Figure 9:	Mercury Concentrations in 45 cm (18 inch) Walleye Over Time in Lake Erie Block 1	45
Figure 10:	Mercury Concentration vs. Length in Walleye and Bass from Lake Erie Block 1	45
Figure 11:	PCB Concentrations in 30 cm (12 inch) White Bass Across Lake Erie 1990-2000	46
Figure 12:	PCB Concentrations in 30 cm (12 inch) White Bass Over Time in Lake Erie Block 1	46
Figure 13:	PCB Concentrations in 45 cm (18 inch) Channel Catfish in Lake Erie Block 1	46
Figure 14:	PCB Concentrations in 65 cm (25 inch) Carp in Lake Erie Block 1	47
Figure 15:	PCB Concentration vs. Length in Fish from Lake Erie Block 1	47
Figure 16:	2378-TCDD in Herring Gull Eggs - Middle I., 1987- 2001	48
Figure 17:	PCB 1:1 in Herring Gull Eggs - Port Colborne, 1974-2001	49
Figure 18:	Map of Areas of Concern Around the Lake Erie Basin	53
Figure 19:	Frequency of Dead Fish Species Observed Along NY Lake Erie Beaches, September, 2001	67
Figure 20:	Percent Mortality on NY Lake Erie Shoreline by Species Observed - Fall 2000	68
Figure 21:	Number of Cormorant Nests on Lake Erie	69
Figure 22:	Recent and Historic Lake Erie Water Levels	71
Figure 23:	Monthly Water Level Bulletin Including 6 Month Forecast	71

List of Tables

Table 1:	Summary of Lake Erie Ecosystem Alternatives	3
Table 2:	Summary of Beneficial Use Impairment Conclusions from Lake Erie LaMP 2000 (updates for 2002 are noted in italics)	9
Table 3:	Summary of Lake Erie Wildlife Habitats and Their Impairment Status	12
Table 4:	Rural Clean Water Programs in the Ontario Lake Erie Basin	19
Table 5:	PCB Reduction Plan Activities Update	30
Table 6:	Mercury Reduction Plan Activities Update	31
Table 7:	Summary of Ongoing Monitoring Efforts in Lake Erie in 2000	39
Table 8:	Ohio Lake Erie Quality Index Indicators	50
Table 9:	Lake Erie LaMP Work Plan 2002 - 2004	74

