## New York Update

# Waterbird Mortality in New York Waters of Lakes Erie and Ontario Resulting from Type E Botulism 

Kenneth Roblee<br>NYS Department of Environmental Conservation<br>Bureau of Wildlife, Region 9

Botulism Observed in a Gull Colony

- The Bethlehem Steel gull colony near Buffalo contains approximately 10,000 pairs of nesting Ring-billed gulls.
- During a July 5, 2002 inspection of the colony, 946 dead gulls (adults and chicks) were counted.
- The following week approximately 3,000 dead gulls were observed.
- Type E botulism was diagnosed and mudpuppies were found in gull stomachs.

> Lake Erie Botulism Mortality Surveys
> 100m Transect Survey Results
> by NYSDEC 10/15/02-1/09/03
> Table 1, Section 1

| Species | Predicted Mortality | Upper Conf. | Lower Conf. |
| :--- | ---: | ---: | ---: |
|  |  |  |  |
| Common Loon | 2,042 | 3,447 | 637 |
| Horned Grebe | 273 | 482 | 64 |
| Red Necked Grebe | 36 | 84 | 0 |

> Lake Erie Botulism Mortality Surveys
> 100m Transect Survey Results
> by NYSDEC 10/15/02-1/09/03
> Table 1, Section 2

| Species | Predicted Mortality | Upper Conf. | Lower Conf. |
| :--- | ---: | ---: | ---: |
|  |  |  |  |
| Wood Duck | 18 | 54 | 0 |
| Greater Scaup | 128 | 213 | 43 |
| Long-tailed Duck | 12,616 | 20,808 | 4,424 |
| Scoter | 18 | 54 | 0 |
| C. Merganser | 18 | 54 | 0 |
| R-b Merganser | 839 | 1,405 | 273 |
| Unidentified Merg. | 383 | 649 | 117 |
| Unidentified Duck | 36 | 108 | 0 |

# Lake Erie Botulism Mortality Surveys <br> 100m Transect Survey Results <br> by NYSDEC 10/15/02-1/09/03 

Table 1, Section 3

| Species | Predicted Mortality | Upper Conf. | Lower Conf. |
| :--- | ---: | ---: | ---: |
|  |  |  |  |
| Bonaparte's Gull | 18 | 54 | 0 |
| Ring-billed Gull | 273 | 429 | 117 |
| Herring Gull | 474 | 767 | 181 |
| Gr. Black-bkd. Gull | 36 | 84 | 0 |
| Unidentified Gull | 91 | 203 | 0 |
|  |  |  |  |
| TOTAL BIRDS* | 17,301 | 27,566 | 7,036 |

* Total from Table 1, sections 1, 2 \& 3


## Lake Erie Waterbird Mortality New York Botulism Transect Survey Results

|  | $\mathbf{2 0 0 0}$ | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ |
| :--- | ---: | ---: | ---: |
|  |  |  |  |
| Common Loon | 583 | 1,149 | 2,042 |
| Horned Grebe | 109 | 0 | 273 |
| Long-tailed Duck | 0 | 310 | 12,616 |
| Red-breasted Merganser | 2,479 | 91 | 839 |
| Ring-billed Gull | 1,714 | 510 | 273 |
| TOTAL BIRDS | 5,415 | 2,862 | 17,301 |

## Lake Ontario Botulism Mortality Survey <br> 100 M Transect Survey Results <br> NYSDEC 2002

| Species | Predicted Mortality | Upper Limit <br> 95\% Confidence | Lower Limit <br> 95\% Confidence |
| :--- | ---: | ---: | ---: |
| Long-tailed Duck | 675 | 1,336 | 0 |
| Herring Gull | 80 | 83 | 0 |
| Ring-billed Gull | 129 | 251 | 7 |
| Greater Black-backed Gull | 32 | 76 | 0 |
| Double-crested Cormorant | 32 | 76 | 0 |
| Unknown Duck | 16 | 48 | 0 |
| Unknown Gull | 64 | 25 | 3 |
| Misc Unknown | 16 | 48 | 0 |
| TOTAL BIRDS | 1,046 | 1,924 | 168 |



## Niagara County Botulism Mortality Survey 100 M Transect Survey Results <br> NYS DEC 2002

| Species | Predicted <br> Mortality | Upper Limit <br> 95\% Confidence | Lower limit <br> 95\% Confidence |
| :---: | :---: | :---: | :---: |
| Long-tailed Duck | 700 | 1,169 | 231 |
| Unknown Duck | 17 | 50 | 0 |
| Ring-billed Gull | 100 | 201 | 0 |
| Herring Gull | 67 | 164 | 0 |
| Greater Black-backed Gull | 17 | 50 | 0 |
| Unknown Gull | 17 | 50 | 0 |
| Double-crested Cormorant | 17 | 50 | 0 |
| Misc. Unknown | 17 | 50 | 0 |
| TOTAL BIRDS | 950 | 1,565 | 335 |

## 2002 in Summary

- Significant mortality observed at Bethlehem Steel gull colony.
- Loon, long-tailed duck and total bird mortality increased in Lake Erie.
- Botulism-caused mortality observed in gulls and long-tailed ducks in Lake Ontario.


# Long-Term Assessments of Warmwater Fish Stocks and Characteristics of Fish Kill Events in NY's Portion of Lake Erie 

Don Einhouse
NYS Department of Environmental Conservation Lake Erie Fisheries Unit

## Common fish kills observed in eastern Lake Erie through the years

- March-April,
- May-June
- June-July
- June-August

Alewife \& Gizzard Shad - temperature stress
Smelt - Glugea and spawning
Smallmouth Bass - spawning \& upwellings?
Warmwater Fish - upwellings



Number of Fish Kill Investigations per Month, 2002




## Smallmouth Bass Survival









## Round Goby Abundance NY Waters of Lake Erie



## Sturgeon Mortalities and Goby Abundance



## Smallmouth Bass Diets from Annual September Sampling

|  |  | Percent of stomachs with selected prey |  |  |  |
| :--- | ---: | :---: | :---: | :---: | :---: |
| Year | Sample (n) | crayfish | clupeids | smelt | goby |
| 1985 <br> -87 | 173 | $23.7 \%$ | $9.8 \%$ | $4.6 \%$ | $0.0 \%$ <br> Prior to Goby <br> presence |
| 1999 | $\mathbf{8 0}$ | $11.3 \%$ | $15.0 \%$ | $10.0 \%$ | $42.5 \%$ |
| 2000 | 170 | $4.1 \%$ | $1.2 \%$ | $2.4 \%$ | $89.4 \%$ |
| 2001 | 58 | $1.7 \%$ | $1.7 \%$ | $6.9 \%$ | $58.6 \%$ |
| 2002 | 22 | $13.6 \%$ | $4.5 \%$ | $0.0 \%$ | $81.8 \%$ |



## NYS DEC - Lake Erie Unit Research Partnerships

- NYS DEC - Wildlife Pathology Unit
- Cornell University - Aquatic Animal Health Program
- SUNY Fredonia - Biology Department


## Questions?

- Where is the anaerobic environment in eastern Lake Erie?
- Some benthic fish species are conspicuous by their absence in fish kills, ex. suckers, yellow perch?
- We have experienced abundant mussel densities for over a decade, but botulism only recently?

