

Type E Botulism in Michigan: A Historical Review



Thomas Cooley
Wildlife Disease Laboratory

In the Beginning



- The first waterfowl die-off attributed to botulism in Michigan occurred in 1941, being diagnosed in wild ducks in the Lake Erie marshes near Monroe. The toxin was identified as Type C.
- Approximately 1000 ducks and shorebirds died.



In the Beginning (cont.)



- Scattered reports of dead gulls and 1 loon occurred in counties on Lake Michigan, Lake Huron, and Lake Superior between 1959 and 1962.
- No birds were examined, so no cause of death was determined.



1963



- The first waterfowl die-off attributed to Type E botulism toxin occurred in 1963.
- Prior to this die-off Type E botulism was not known to exist in wild birds in North America.
- The 1963 die-off extended from the Indiana border to Leelanau County, nearly the entire Lake Michigan shoreline of the Lower Peninsula.
- The estimated mortality was 7720 birds (3300 loons, 4290 gulls, and 130 miscellaneous birds).

1963 (cont.)



- The die-off occurred between August and December.
 - Gulls in early August in Van Buren County.
 - Loons in mid-November in Berrien County.
 - Loons and Gulls in early December in Van Buren County.
- The greatest mortality occurred in late November/early December.

Type E Botulism in Michigan, 1963



1964



- The 1964 die-off occurred along the northern end of Lake Michigan from St. Ignace to Wisconsin.
- The estimated mortality was 4920 birds (3570 loons, 820 gulls, 200 grebes, 240 ducks, and 30 miscellaneous birds).
- The die-off occurred between August and October.
 - Gulls in early August in Delta County (Upper Peninsula), and Benzie, Oceana, and north and south Manitou Islands (Lower Peninsula).

1964 (cont.)



- Loons in early September in Delta County.
- Loons in late September/early October in Delta, Schoolcraft, and Mackinac Counties.
- Loons in early October in Leelanau County and on Beaver Island (Charlevoix County).
- Compared to 1963 there were considerably fewer gulls but more grebes and ducks. Total loon numbers were comparable.

1964 (cont.)



- Mortality was the heaviest in the north end of Lake Michigan and peaked among loons in early October.
- Several waves of loon carcasses were found over a 3 month period.



Type E Botulism in Michigan, 1964



1965



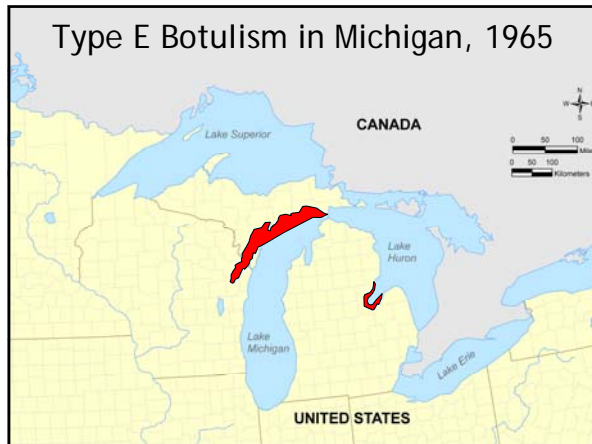
- No estimates were determined in the 1965 die-off.
- The mortality of loons was probably less than in 1963 and 1964.
- Mortality was confined largely to the northern end of Lake Michigan and primarily involved loons and grebes. Dead gulls were more widely distributed.

1965 (cont.)




- Heavy losses also occurred among gulls on Saginaw Bay in Lake Huron.

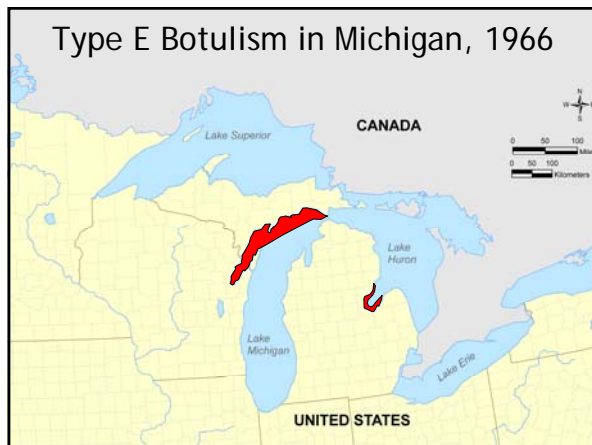





1966



- The 1966 die-off consisted of scattered losses of gulls along much of Lake Michigan with additional mortality consisting of minor loon losses and significant grebe losses.
- Mortality was along the Upper Peninsula shoreline.
- The die-off occurred in October.
- Considerable mortality of gulls and some water birds in Saginaw Bay in Lake Huron.




1976

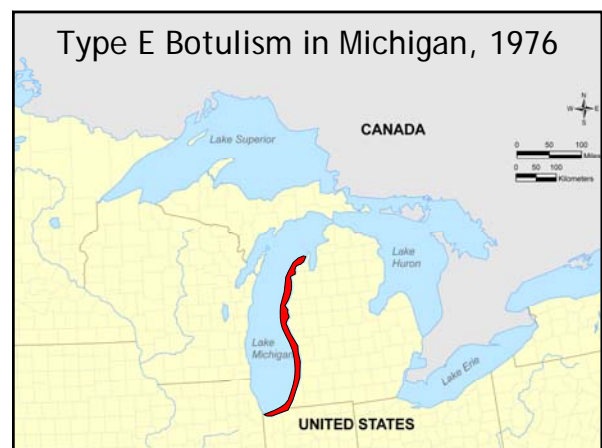


- The 1976 die-off extended from the Indiana border to Muskegon.
- The estimated mortality was 600-1000 birds.
- The die-off occurred in October and November.
- November 8, 1976 - A flight from the Indiana-Michigan border to Muskegon (145 km) found 592 dead loons, 6 moribund loons, and 6 dead gulls.

1976 (cont.)



- Between October 26 and November 19, 1976, 342 avian carcasses were collected and examined. The species examined were 330 common loons, 1 red-throated loon, 6 gulls, 1 old squaw (long-tailed duck), 2 grebes (1 eared grebe and 1 unidentified), 1 redhead, and 1 white-winged scoter.



1981



- The 1981 die-off occurred along the southern and eastern end of Lake Superior at Whitefish Point in Chippewa County.
- 13 common loons were examined and Type E botulism was confirmed.



Type E Botulism in Michigan, 1981



1983



- The 1983 die-off occurred along the northern end of Lake Michigan in Delta and Schoolcraft Counties in the Upper Peninsula.
- The estimated mortality was 592 common loons.



1983



- It was suspected that the loons dying during this outbreak were from large rafts of birds reported by the Michigan Department of Natural Resources to be offshore and to the southeast of the Garden Peninsula.

Type E Botulism in Michigan, 1983



2006



- The 2006 die-off occurred along the northern end of Lake Michigan involving the Sleeping Bear Dunes National Lakeshore (SBDNL) and the eastern portion of the Upper Peninsula.
- The estimated mortality was 2985 birds (1300 horned grebes, 650 double-crested cormorants, 590 gulls, 155 mergansers, 190 common loons, and 100 red-necked grebes) from the SBDNL area and 580 birds (500 horned grebes, 60 red-necked grebes, and 20 common loons) in the Upper Peninsula.

2006 (cont.)



- The die-off occurred between August and November in the SBDNL area (Benzie and Leelanau Counties) and in September in the eastern portion of the Upper Peninsula in Schoolcraft County.



Type E Botulism in Michigan, 2006



2007



- The 2007 die-off occurred along the northern end of Lake Michigan in the Lower Peninsula extending to the straits of Mackinac (Benzie, Leelanau, Antrim, Charlevoix, and Emmet counties) and extending along the Upper Peninsula through Mackinac, Delta and Schoolcraft counties.
- The total estimated mortality for the entire area was 7500 birds.

2007 (cont.)



- In the SBDNL area the die-off began in June and consisted primarily of double-crested cormorants, ring-billed gulls, and horned grebes, but also involved the federal and state listed endangered piping plovers and state listed threatened Caspian terns.

2007 (cont.)



- The die-off over the entire affected area continued at low to moderate numbers throughout the summer, peaking between September and November.
- Species primarily affected were common loons and long-tailed ducks.

Type E Botulism in Michigan, 2007



Questions?

