

## Reassessment of Lake Michigan predator–prey balance, accounting for recent changes in salmonine feeding ecology/population dynamics

The goal of this study is to assess the predator–prey balance in Lake Michigan by accounting for recent changes in the prey fish community and associated shifts in salmonine feeding ecology and population dynamics.

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### TIMELINE

Launch: July 2018  
Completion: July 2021

### DNR PARTNER BUREAU

Fisheries Management

### FUNDING

Federal Aid in Sportfish  
Restoration

### EXTERNAL STAKEHOLDERS

Michigan DNR  
United States Geological Survey  
Salmonid Working Group

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Stock assessment modeling has been used to estimate salmonine and prey abundances in Lake Michigan and evaluate the predator-prey balance. Past adjustments to stocking rates (1985, 1998, 2004, 2013 and 2017) were reasonable measures to stabilize the predator–prey system, but alewife abundance in recent years has been driven to very low levels.

Additionally, the Great Lakes Fishery Commission has used Predator–Prey Ratio Analysis (PPRA) for Lake Michigan as a primary tool to evaluate stocking decisions for each of the last few years.

Reassessment of salmonine and prey population dynamics would provide a more accurate account of the Lake Michigan predator–prey system, given the recent changes in the lake’s food web.

Data inputs for this study include stocking numbers and annual biological/fishery data for salmonines (1966–present). Annual relative abundance and biological data for alewife, rainbow smelt and other prey species (1973–present) are also included in the predator-prey model.



- » Alewife abundance in recent years has been driven to very low levels, altering the availability of food for predator species.
- » Predator–Prey Ratio Analysis (PPRA) has been used as a primary tool to evaluate annual stocking decisions for Lake Michigan. This study will provide updated inputs for the PPRA.
- » Reassessment of salmonine and prey population dynamics will provide a more accurate understanding of the current predator–prey balance in Lake Michigan.

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