Forage Task Group Executive Summary

March 2024

Lake Erie Committee

REPRESENTING THE FISHERY MANAGEMENT AGENCIES OF LAKE ERIE AND LAKE ST. CLAIR

Introduction

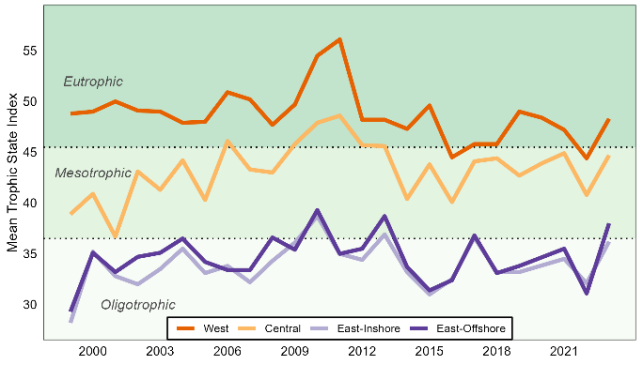
The Lake Erie Committee Forage Task Group (FTG) report addresses progress made on four charges:

1. Report on the results of the interagency lower trophic level monitoring program and status of trophic conditions as they relate to the Lake Erie Environmental Priorities.
2. Describe the status and trends of forage fish in each basin of Lake Erie and evaluate alternate data sources and methods to enhance description of forage fish abundance.
   2.1. Describe forage fish abundance and status using trawl data.
   2.2. Report on the diets of important Lake Erie predator fish where available.
   2.3. Describe growth and condition of Walleye, Lake Trout, and Black Bass.
3. Continue hydroacoustic assessment of the pelagic forage fish community in Lake Erie, while incorporating new methods in survey design and analysis following the GLFC's Great Lakes Hydro Acoustic Standard Operating Procedures where possible/feasible.
4. Act as a point of contact for any new/novel invasive aquatic species and incorporate into the USGS Nonindigenous Aquatic Species database.

The complete report is available from the Great Lakes Fishery Commission's Lake Erie Committee Forage Task Group website (http://www.glfc.org/lake-erie-committee.php) or upon request from a Lake Erie Committee, STC, or FTG representative.

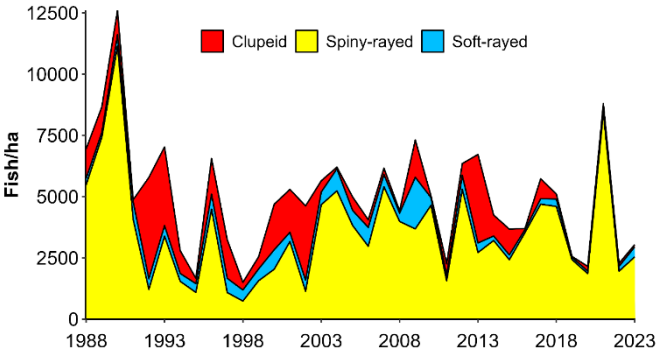
Interagency Lower Trophic Level Monitoring

The Lower Trophic Level Assessment monitoring program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize trends in lake productivity. In 2023, the Trophic State Index, which is a combination of phosphorus levels, water transparency, and chlorophyll *a*, indicated that the Central Basin was within the targeted mesotrophic status. However, the West Basin returned to the above-target Eutrophic classification after one year of mesotrophy. The East Basin offshore and nearshore areas were mesotrophic and oligotrophic, respectively, in 2023. Low hypolimnetic dissolved oxygen continues to be an issue in the Central Basin during the summer months.



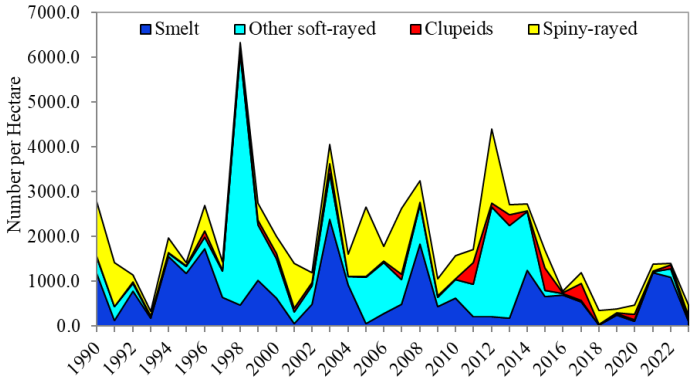
West Basin Status of Forage

In 2023, data from 71 trawl tows were used (up from 69 in 2022). Total forage density averaged 3,043 fish per hectare across the West Basin, similar to moderate levels in 2019–2020 and 2022. Forge biomass (14.9 kg/ha) increased 39% from 2022. Age-0 White Perch abundance (1,912/ha) increased. Age-0 Yellow Perch density (381/ha) was well under recent levels. Age-0 Gizzard Shad abundance (94/ha) remained below the ten-year mean (682/ha). Age-0 Walleye relative abundance (132/ha) remained above average. Densities of Emerald Shiners have remained low for eight years. Round Goby abundance (15/ha) is on a two-year decline.



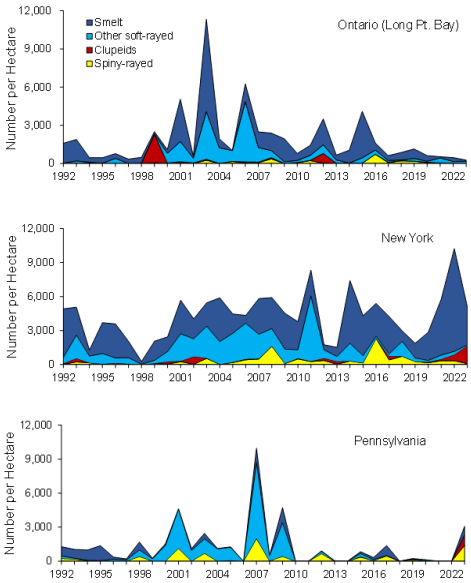
Central Basin Status of Forage

In 2023, 57 trawl tows were completed in the Ohio waters of the Central Basin. Total forage density averaged 470 fish per hectare across the Central Basin, returning to levels similar to 2020. Total forage biomass was 5.093 kg/ha, well below the long-term mean. Age-0 Rainbow Smelt density decreased from 2022 and was well below the long-term average. Age-1+ Rainbow Smelt density decreased from 2022 and was well below the long-term mean. Round Goby indices decreased across the basin and were below the long-term mean. Spiny-rayed forage density (195/ha) increased from 2022. Yellow Perch density was similar to 2022; however, these continue to be some of the lowest densities in the time series. Walleye densities were well above the long-term mean.



East Basin Status of Forage

In 2023, overall forage fish densities were the ninth highest in the time series in New York waters, remained below time series averages in offshore Ontario waters, and were the third highest in the time series in Pennsylvania waters. Total forage biomass was 25.0 kg/ha in New York waters and was the fourth highest level in the time series. Catches of age-1+ Rainbow Smelt were low in Ontario and Pennsylvania and moderate in New York. Catches of age-0 Emerald Shiner (400/ha) increased in 2023 in New York waters; however, catches of age-1+ Emerald Shiner were low. Catches of Emerald Shiner in Ontario were the highest observed since 2015, but still considered low. No Emerald Shiner were sampled in Pennsylvania waters. Round Goby densities were below average in all jurisdictions. Abundance of clupeids (Gizzard Shad, Alewife) was the highest in the time-series in New York and Pennsylvania but below average in Ontario. Moderate numbers of age-0 Walleye were caught in New York and above-average catches age-1 Yellow Perch. Catch of Age-0 Lake Whitefish was at the second highest level in the time series in New York waters. Catches of most other species were low.



Hydroacoustic Assessments

The primary purpose of Lake Erie hydroacoustic surveys is to estimate densities of important forage fishes in each basin of Lake Erie in July during the new moon. After completing several years of comparison studies, the hydroacoustic surveys in Lake Erie adopted a common stratified, random transect design. The standardization of the survey design allows for results to be generated lake wide and by basin. In 2023, a total of 460 km of transects were sampled, 76 water column profiles were measured, and 37 companion mid-water trawls were towed (the latter in the Central Basin only). Densities of fish (number per hectare) were highest in the West Basin, followed by the East Basin, and lowest in the Central Basin. In the East Basin, age-1+ Rainbow Smelt density increased in 2023 relative to 2022 and was well above the time series low observed in 2019. In the Central Basin, total density of fish remained low in 2023, with Rainbow Smelt being the most abundant species in both the epilimnion and hypolimnion. In the West Basin, prey fish density increased significantly in 2023 to the second highest value in the time series.

Aquatic Invasive Species

In 2023, the U.S. Fish and Wildlife Early Detection and Monitoring program did not capture any novel aquatic invasive species. No other Lake Erie agency encountered a novel aquatic invasive species, either. The FTG is continuing work towards incorporating the FTG Aquatic Invasive Species (AIS) database as well as other agency data into the USGS Nonindigenous Aquatic Species database so that the data can be archived and help track AIS on greater geographic scale.