Forage Task Group Executive Summary

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 Fish Community Objectives.
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 new USGS invasive 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 2022, the Trophic State Index, which is a combination of phosphorus levels, water transparency, and chlorophyll *a*, indicated that both the West and Central Basins were within the targeted mesotrophic status (favoring percid production). This is the first year that the West Basin reached target status. The East Basin offshore and nearshore areas were both oligotrophic in 2022. Low hypolimnetic dissolved oxygen continues to be an issue in the Central Basin during the summer months.
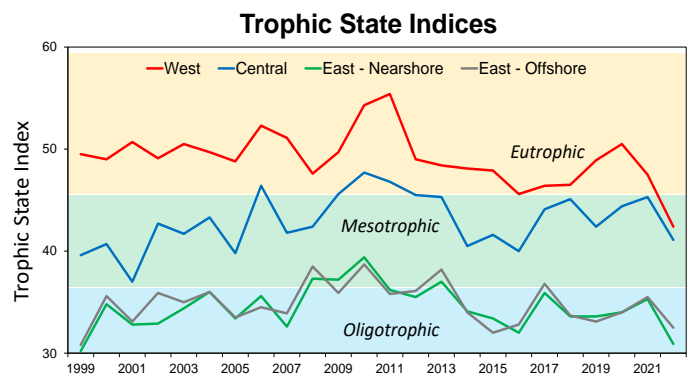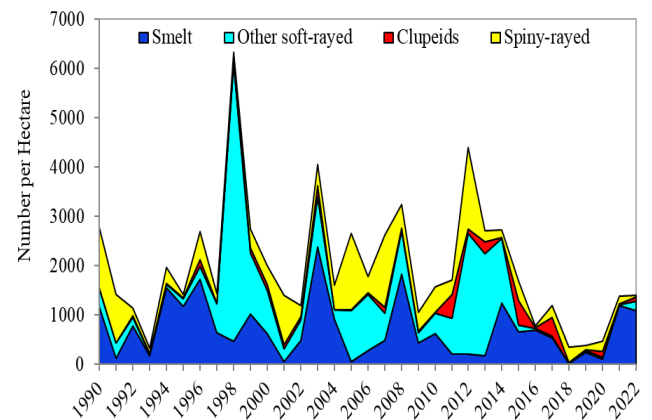

West Basin Status of Forage

In 2022, data from 69 trawl tows were used (up from 68 in 2020). Total forage density averaged 2,278 fish per hectare across the West Basin, returning to low levels similar to 2019–2020. Forage biomass (10.8 kg/ha) also fell from the 2021 high. Age-0 White Perch abundance (1,160/ha) fell from a 30-year high. Age-0 Yellow Perch density (572/ha) was near average. Age-0 Gizzard Shad abundance (124/ha) rose from 2021 but remained below the ten-year mean (714/ha). Age-0 Walleye relative abundance (83/ha) fell from a time-series high. Densities of Emerald Shiners have remained low for seven years. Round Goby abundance (25/ha) fell from a recent high abundance in 2021.
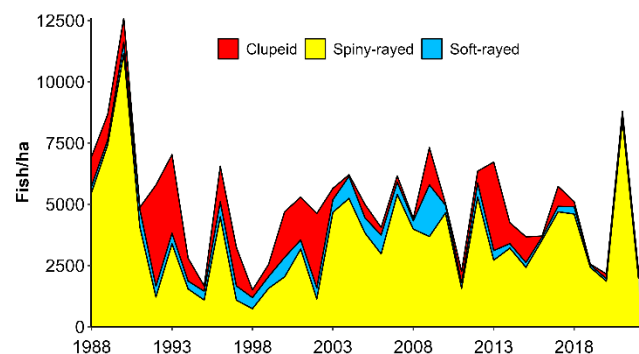
Central Basin Status of Forage

In 2022, 57 trawl tows were completed in the Ohio waters of the Central Basin (up from 33 in 2021). Total forage density averaged 1,401 fish per hectare across the Central Basin, similar to 2021. Total forage biomass was 4.656 kg/ha and well below the long-term mean. Age-0 Rainbow Smelt density increased from 2021 and was near the long-term mean. Age-1+ Rainbow Smelt density decreased from a 2021 and is well below the long-term mean. Round Goby indices decreased across the basin and were below the long-term mean. Age-0 Emerald Shiner density (120/ha) increased from 2021. Yellow Perch density was similar to 2021; 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

Total forage fish density in 2022 decreased in Ontario and remains well below the long-term mean. Forage fish density increased in New York waters and was at the highest level in the time series, mainly due to a high abundance of age-0 Rainbow Smelt (highest in time series). Catches of age-1+ Rainbow Smelt were low in both Ontario and New York. Catches of age-0 and age-1+ Emerald Shiner were low in all jurisdictions. Round Goby densities were below average in both New York and Ontario waters. Abundance of clupeids (Gizzard Shad, Alewife) was the second highest in the time series in New York but below average in Ontario. High numbers of age-0 Walleye were caught in New York and moderate catches of age-0 and age-1 Yellow Perch. Catches of most other species were low.
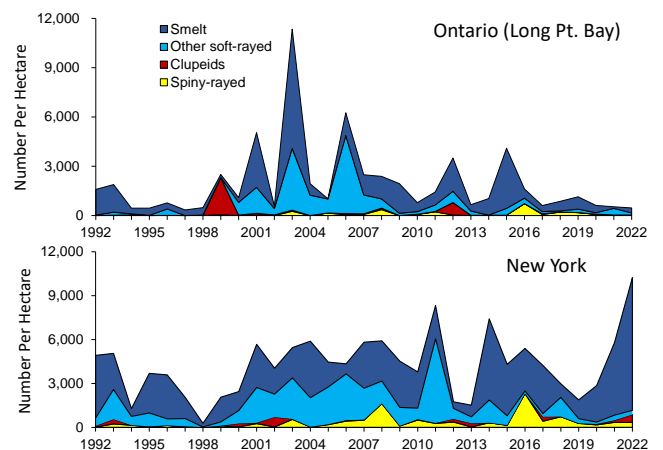
Hydroacoustic Assessments

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 2022, a total of 455 km of transects were sampled, 60 water column profiles were measured, and 34 companion mid-water trawls were towed (the latter in the Central Basin only). Densities of fish (number per hectare) were highest in the East Basin, followed by the Central Basin, and lowest in the West Basin. In the East Basin, age-1+ Rainbow Smelt density increased slightly in 2022 relative to 2021, and was well above the time series low observed in 2019. In the Central Basin, fish species other than Rainbow Smelt and Emerald Shiner were the most abundant in the epilimnion, whereas age 1+ Rainbow Smelt were the most abundant in the hypolimnion. In the West Basin, prey fish density was much lower in 2022 than observed in 2021 and was the third lowest value for the time series.

Aquatic Invasive Species

In 2022, the U.S. Fish and Wildlife Early Detection and Monitoring program did not capture any novel aquatic invasive species. Across all agencies, the only notable catch was one Striped Bass (*Morone saxatilus*) captured in Dunkirk, NY. 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.