

Forage Task Group Executive Summary



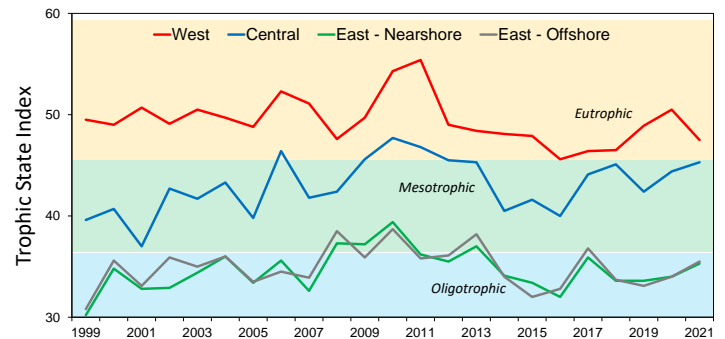
The Lake Erie Committee Forage Task Group (FTG) report addresses progress made on four charges:

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 use of forage fish in the diets of selected commercially or recreationally important Lake Erie predator fish.
 - 2.3. Describe growth and condition of selected commercially or recreationally important Lake Erie predator fish
3. Continue hydroacoustic assessment of the pelagic forage fish community in Lake Erie, incorporating new methods in survey design and analysis while following the GLFC's Great Lakes Hydro Acoustic Standard Operating Procedures where possible/feasible. Support STC review of hydroacoustics.
4. Act as a point of contact for any new/novel invasive aquatic species.

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.

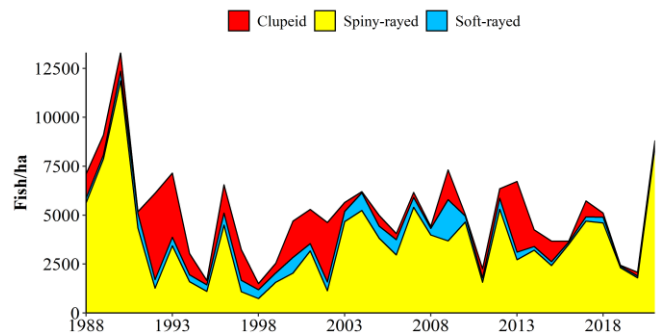
Interagency Lower Trophic Level Monitoring

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 2021, the Trophic State Index, which is a combination of phosphorus levels, water transparency, and chlorophyll *a*, indicated that the West Basin was above the targeted mesotrophic status, while the Central Basin was barely within mesotrophic status (favoring percid production). The East Basin offshore and nearshore areas were both oligotrophic in 2021. Low hypolimnetic dissolved oxygen continues to be an issue in the Central Basin during the summer months.



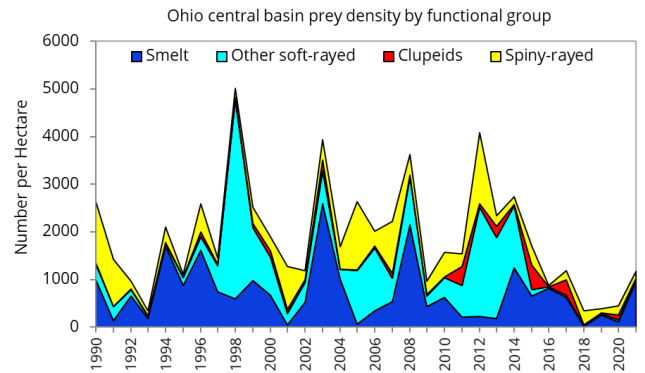
West Basin Status of Forage

In 2021, data from 68 trawl tows were used (up from 66 in 2020). Total forage density averaged 8,800 fish per hectare across the West Basin - the largest forage density since 1990. A large outlier catch of White Perch did upwardly bias the total density estimate. Age-0 Walleye relative abundance (346/ha) was a record high for the time series. Age-0 Yellow Perch density (1,358/ha) was well above average. Age-0 White Perch (6,438/ha) was the greatest since 1990. Age-0 Gizzard Shad abundance (81/ha) was below the ten-year mean (713/ha). Densities of Emerald Shiners have remained low for seven years. Round Goby abundance (81/ha) was the highest since 2009.



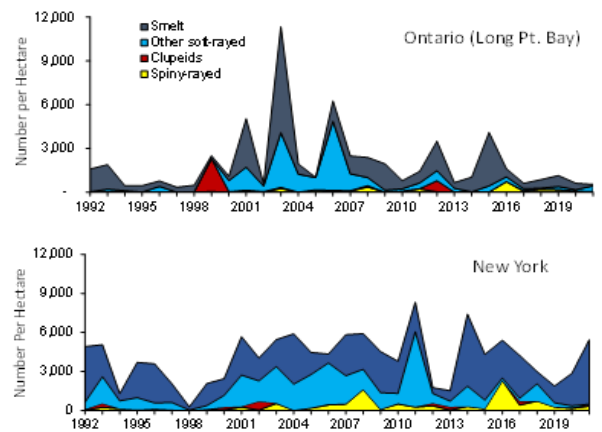
Central Basin Status of Forage

In 2021, 32 trawl tows were completed in the Ohio waters of the Central Basin. Forage abundance increased in 2021 relative to 2020, with most of the catch comprised of Rainbow Smelt and spiny-rayed species (e.g., yellow perch). However, total forage density remained well below the long-term mean. Age-0 Rainbow Smelt density increased from 2020 and were above the long-term mean. Age-1+ Rainbow Smelt abundance decreased from a recent high abundance in 2020 and is now one of the lowest densities in the time series. Round Goby age-0 indices decreased across the basin and were below the long-term mean. Emerald Shiner remain at very low densities in the basin. Yellow Perch density increased slightly from 2020; however, these continue to be some of the lowest densities in the time series. Age-0 Walleye abundance was the highest ever recorded in the time series. The age-0 Walleye index was almost five times the long-term mean.



East Basin Status of Forage

Total forage fish density in 2021 decreased in Ontario and has been below the long-term mean for the last 5 years. Forage fish density increased in New York and is at the highest level since 2016. Catches of age-0 Rainbow Smelt were very high in New York waters (2nd highest in time series), whereas they were low in Ontario. 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 increased in Ontario and were above the long-term mean. Round Goby remained below average in New York waters. Gizzard Shad and Alewife densities were above average in New York and below average in Ontario. Age-0 Walleye density in 2021 was the highest ever observed 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. In the East Basin, age-1+ Rainbow Smelt density (# fish/hectare) decreased in 2021 relative to 2020, but remained higher than the low seen in 2019. In the Central Basin, age-0 Rainbow Smelt densities were the highest on record, while Emerald Shiner and age-1+ Rainbow Smelt remained at low levels. In the West Basin, prey fish density was greater in 2021 than the last five years, whereas prey biomass (kg/hectare) was low suggesting that the forage fish community was composed of small, young fish. Across all basins, work continued on the Lake Erie hydroacoustic survey redesign, and another year of comparison data (new vs. old design) was collected in the Central and East Basins. Further analyses will take place in 2022 with the results informing the path forward for the Lake Erie hydroacoustic survey design.

Aquatic Invasive Species

In 2021, the U.S. Fish and Wildlife Early Detection and Monitoring program captured a Nile Tilapia near Cleveland, Ohio; however, additional sampling efforts in the same area did not yield any more Nile Tilapia. No other nonindigenous aquatic species were captured in Lake Erie. The FTG is working towards incorporating the FTG Aquatic Invasive Species (AIS) database with the USGS Nonindigenous Aquatic Species database so that the data can be archived and help track AIS on greater geographic scale.