

FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2018



Introduction

The Lake Erie Committee Forage Task Group report addresses progress made in 2017 on five 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 Goals and Objectives.
2. Describe the status and trends of forage fish in each basin of Lake Erie.
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 Hydroacoustic Standard Operating Procedures where possible/feasible.
4. Report on the use of forage fish and new invasive species in the diets of selected commercially or recreationally important Lake Erie predator fishes.
5. Develop and maintain a database to track new or emerging Aquatic Invasive Species in Lake Erie that exhibit the potential to directly impact economically important fisheries.

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 an LEC, STC, or FTG representative.

Interagency Lower Trophic Level Monitoring

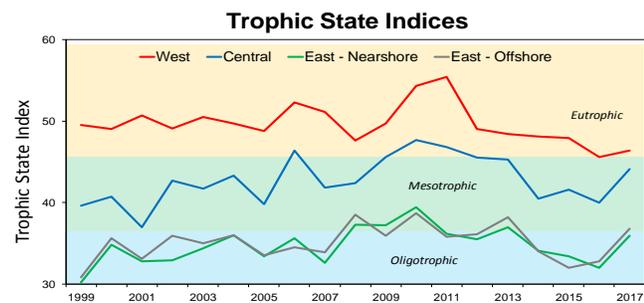
The lower trophic level monitoring (LTLA) program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize ecosystem trends. The Trophic State Index, which is a combination of phosphorus levels, water transparency, and Chl *a* measures, indicate that the western basin is slightly above the targeted mesotrophic status, the central basin is within targeted mesotrophic status, which favors percid production, and the nearshore waters of the eastern basin are borderline mesotrophic/oligotrophic. The offshore eastern basin waters remain near targeted oligotrophic status. Trends across Lake Erie in recent years indicate that overall productivity is slowly declining. Low hypolimnetic dissolved oxygen continues to be an issue in the central basin during the summer months.

West Basin Status of Forage

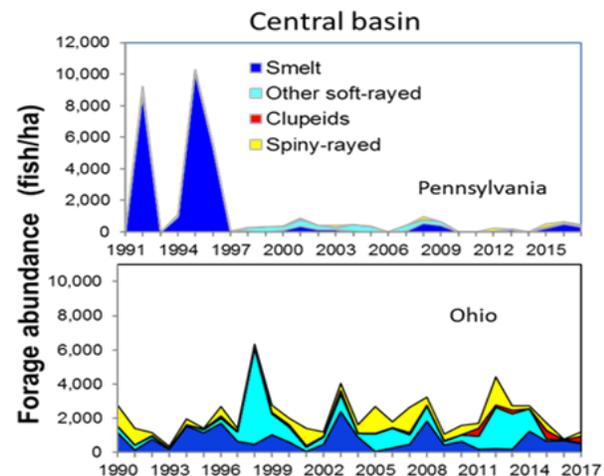
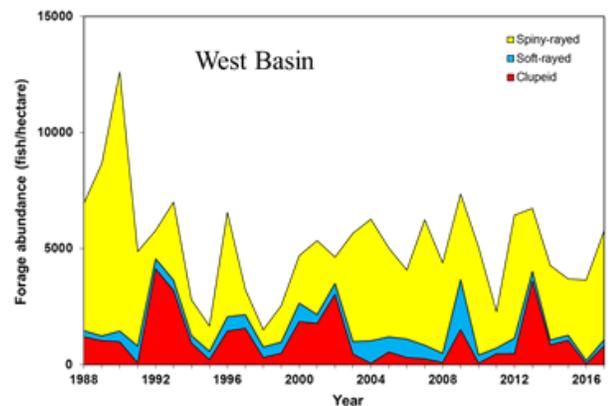
In 2017, hypolimnetic dissolved oxygen levels were below the 2 mg per liter threshold at only one site during the August trawling survey. In total, data from 72 sites were used in 2017. Total forage abundance increased 58%, to above the long-term mean. Total forage biomass declined slightly. Relative biomass of clupeids increased to well above historic averages. Young-of-the-year Yellow Perch age-0 density was above the long-term mean. Young-of-the-year Walleye abundance was below the long-term mean. Young-of-the-year Gizzard Shad, Rainbow Smelt and Round Goby indices were at long-term means. White Bass abundance was the highest since 2009. Densities of Emerald Shiners were very low. Michigan initiated a trawling program to assess the forage community in August of 2014. The 2017 survey had the highest density of forage sized fish (3,315.4 fish/ha) across the four-year time series.

Central Basin Status of Forage

In the central basin, forage densities in both Pennsylvania and Ohio remain low. All forage group indices were below the 25-year mean. Emerald Shiner indices continue to be well below long-term means throughout the basin. Young-of-the-year Rainbow Smelt indices were at or above long-term means; age 1+ Rainbow Smelt were well below long-term means. Young-of-the-year Yellow Perch indices in Ohio remain below long-term means. In contrast, Pennsylvania index was the third highest in the time series. In Ohio, age-0 Gizzard Shad and Alewife indices were some of the highest in the time series. Round Goby indices in Pennsylvania are above long-term means, while Ohio indices are below long-term means.



Trophic state indices for Lake Erie, 1999-2017. Trophic ranges are in shaded and labelled.



East Basin Status of Forage

In 2017, forage fish densities decreased in Ontario and New York and increased in Pennsylvania. Rainbow Smelt are the most abundant forage species in most years and jurisdictions, and 2017 was no exception. However, this was primarily age-0 Rainbow Smelt in 2017. Very low densities of age-1+ Rainbow Smelt were caught in New York, Ontario and Pennsylvania. Young-of-the-year Emerald Shiners remained at very low densities across the basin. Alewife densities were above long-term means in New York and Ontario. Spiny-rayed fishes were above long-term means in Pennsylvania, driven by high densities of White Perch. Round Goby indices are generally below long-term means throughout the basin.

Hydroacoustic Assessments

The Forage Task Group introduced fisheries hydroacoustic technology on Lake Erie to provide a more comprehensive assessment of pelagic forage fish species abundance and distribution. Beginning with surveys of the eastern basin in 1993, coverage was expanded to the central basin in 2000 and western basin in 2004. In 2017 the east basin survey was conducted from July 17- 25, the central basin survey from July 17-21, and the west basin survey from July 18-21. East basin forage fish density was moderate, with a mean of 3,201 forage fish the size of age-1+ Rainbow Smelt per hectare. The largest density of forage fish occurred between Long Point, ON and Erie, PA. In the central basin, age-0 Rainbow Smelt tended to be higher in the eastern transects compared to the west, and uniformly distributed from north to south across the basin. Yearling-and-older Rainbow Smelt densities were concentrated off Erieau, Ontario. Emerald Shiner have been generally declining since 2011, and have been in very low abundance in the survey since 2015. Western basin forage fish densities were marginally highest on the middle transect (9,007 fish/ha) and lowest on the eastern transect (1,626 fish/ha). Western basin forage fish density (4,726 fish/ha) was the lowest since 2008-2011 and less than half of 2016 densities.

Aquatic Invasive Species

The Aquatic Invasive Species charge was developed in recognition of the need for a systematic, centralized, lake-wide effort to track records of new, non-native species that might become invasive. In 2017, FTG members reported 3 species on the Injurious Species list or other unusual non-native species. One Clown Knifefish was reported by a private citizen from Van Buren Bay, New York. This species is believed to pose little threat as it is not adapted to cold winter water temperatures. One Rudd was captured in Cleveland Harbor in the Central Basin. Forty-Two Grass Carp were reported from Michigan (N=16), and Ohio (N=26) waters of Lake Erie or its connected waterways in 2017. The majority were reproductively-capable diploid fish. Eighteen Grass Carp captured in OH were released alive following surgical implantation of acoustic tags as part of collaborative research to track Grass Carp movements. The remaining 24 Grass Carp were killed and samples taken for ploidy and other testing. Annual fish community surveys (electrofishing, gill nets, trawls, seines, and trap nets) provide extensive spatial coverage on Lake Erie. There were no Bighead or Silver carp captured in assessment surveys in 2017. In addition, neither species was reported from commercial or recreational fisheries.

