

FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2017



Introduction

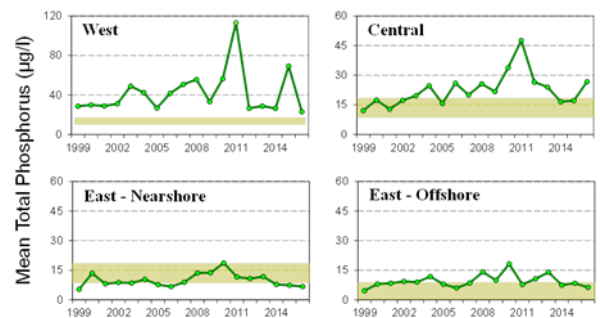
The Lake Erie Committee Forage Task Group report addresses progress made in 2016 on five charges:

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/lakecom/lec/FTG.htm#pub>) or upon request from an LEC, STC, or FTG representative.

Interagency Lower Trophic Level Monitoring

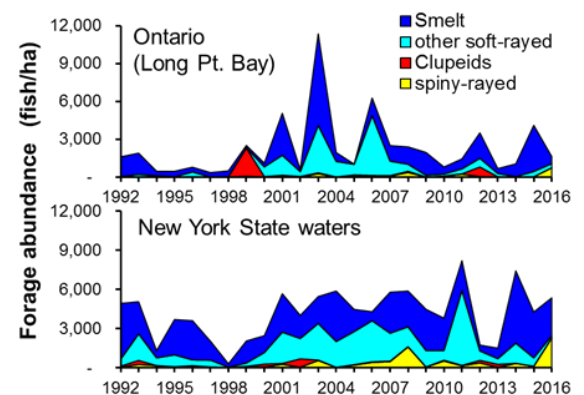
The lower trophic level monitoring (LTLA) program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize ecosystem trends. Phosphorus levels remain slightly above target levels in the west and central basins and near or within target levels in the east basin. Water transparency was below targets in the western basin but near or within targets elsewhere. Trophic class metrics indicate that the western basin is within eutrophic status, which favors centrarchid species, 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.



Mean total phosphorus in each basin of Lake Erie, 1999-2016. Target trophic ranges are in yellow.

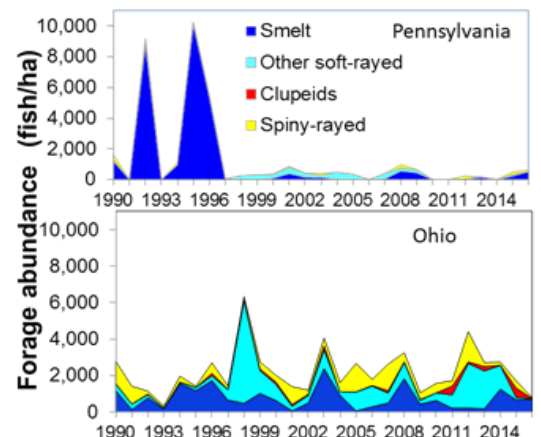
East Basin Status of Forage

Forage fish densities decreased in Ontario and Pennsylvania, and increased in New York. Rainbow Smelt remained the most abundant forage fish species in all jurisdictions. In Ontario, age-0 Rainbow Smelt densities dropped to 538 fish/hectare from a time-series high of 3245 fish/hectare in 2015. The strong 2015 cohort did not result in a strong age-1+ index, with 2016 densities lower than the long-term mean (10 year) in all jurisdictions. Spiny-rayed fish were a dominant component of the forage fish caught in Ontario and New York, with higher than average densities of White Bass, White Perch and Yellow Perch. All other forage species remained low.



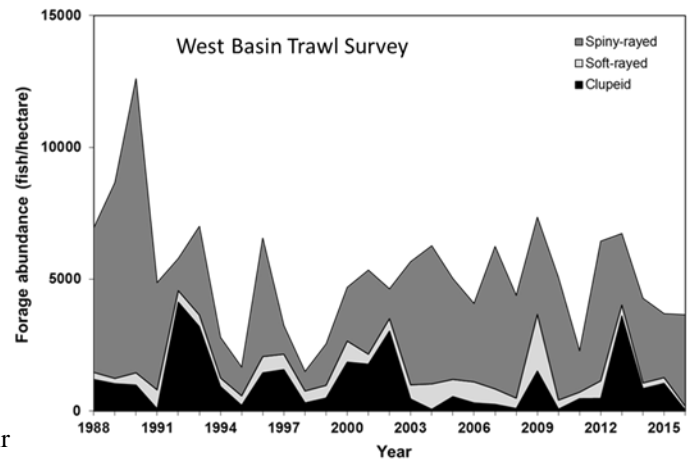
Central Basin Status of Forage

In Pennsylvania, overall forage abundance increased from 2015 due to a large age-0 Rainbow Smelt cohort. In 2015 and again in 2016, Rainbow Smelt and spiny-rayed groups were the most abundant forage in Pennsylvania. Overall forage abundance in Ohio waters declined from 2015 and has been declining since 2012. The largest declines were in the clupeid and spiny-rayed forage groups (primarily age-0 White Perch). All forage group density estimates were below the 25-year average in Pennsylvania and Ohio. Emerald Shiners were almost absent from central basin trawl surveys in 2016. Pennsylvania's age-0 index was only 2.2 fish/ha, and no Emerald Shiners were caught in Ohio age-0 surveys. In 2016, Yellow Perch age-0 indices in Ohio declined from 2015 and were some of the lowest in the time series. In contrast, the age-0 Pennsylvania index was the third highest in the time series and was above the long-term mean. Round Goby abundance decreased and was below long-term means in all jurisdictions.



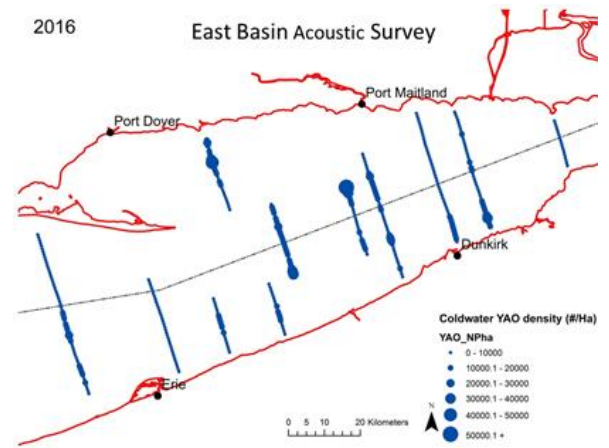
West Basin Status of Forage

In 2016, hypolimnetic dissolved oxygen levels were below the 2 mg per liter threshold at one site during the August trawling survey (located offshore in the Sandusky sub-basin). In total, data from 69 sites were used in 2016. Total forage abundance was below average in 2016, the third year of decline. Clupeid catches were highest in Sandusky Bay and west of Pelee Island. Soft-rayed fish were most abundant near the Detroit River mouth in Ontario waters. Spiny-rayed abundance was densest at the mouth of Sandusky Bay and in the center of the basin west of Pelee Island. Young-of-the-year Yellow Perch decreased relative to 2015 but was above the long-term mean; age-0 Walleye abundance also decreased and was below the long-term mean. Young-of-the-year Gizzard Shad decreased relative to 2015, well below the time series mean. Densities of age-0 and age-1+ Emerald Shiners were the lowest in the time series. Density of Round Goby was one of the lowest abundances since their appearance in 1997.



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. Recent year basin surveys have been accomplished as independent, approximately concurrent summer-time efforts during the new-moon phase in July. Participation in each basin acoustic survey has been shared among jurisdictional agencies with support from the USGS. In 2016 (new moon on July 4), the east basin acoustic survey was conducted from July 4 to 7, and 10, the central basin survey from July 5-9, and the west basin survey on July 5 and 12. Twenty one hydroacoustic transects, 37 temperature and dissolved oxygen profiles and 39 midwater trawls were sampled in total during the 2016 surveys. East basin hydroacoustic forage fish density was moderate, with a mean of 3,452 fish per hectare. The largest densities of fish were located between Port Dover, ON and Dunkirk, NY. In the central basin, age-0 Rainbow Smelt tended to be uniformly distributed throughout the basin. Yearling-and-older Rainbow Smelt densities were highest off Erieau, ON, and Ashtabula, OH. Emerald Shiner density is at the lowest level since the survey began in 2003. Western basin forage fish were more abundant on the southern end of transects with the highest overall densities found at the southern end of the western transect. Western basin forage fish density and biomass estimates in 2016 were much lower than in 2015.



Aquatic Invasive Species

In 2016, the Lake Erie Committee added a new Forage Task Group charge to "Develop and maintain a database to track Aquatic Invasive Species (AIS) in Lake Erie." This 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 2016, FTG members reported 5 species on the Injurious Species list or other unusual non-native species. Three Pacu were reported to Michigan DNR by anglers in Lake St. Clair. One Piranha was reported in a private pond within the Lake Erie basin. Neither of these species is believed to pose a threat as neither is particularly well adapted to tolerating cold winter water temperatures. One Shovelnose Catfish (*Chrysichthys sharpii*), native to southern Africa, was reported from the River Raisin. Rudd were captured in Nanticoke Creek (N=8), Grand River (N=154), Welland River (N=32), and Long Point Bay (N=2) in Ontario. Forty-five Grass Carp were reported from Michigan (N=23), New York (N=5), Ohio (N=7), and Ontario (N=10) waters of Lake Erie or its connected waterways in 2016. The majority were reproductively-capable diploid fish. All Grass Carp captured in ON and NY waters were killed, while all captured in MI and OH were released alive following surgical implantation of acoustic tags as part of collaborative research to track Grass Carp movements.

AIS – Grass Carp Locations West Basin

