

# FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2016



## Introduction

The Lake Erie Committee Forage Task Group report addresses progress made in 2015 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 Aquatic Invasive Species in Lake Erie.

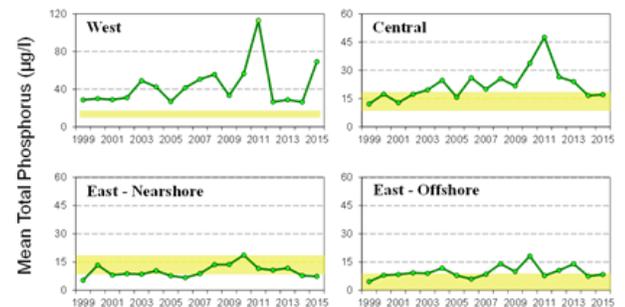
The complete report is available from the Great Lakes Fishery Commission's Lake Erie Committee Forage Task Group website (<http://www.glfc.org/lakecom/lec/FTG.htm#pub>) or upon request from an LEC, STC, or FTG representative.

## Interagency Lower Trophic Level Monitoring

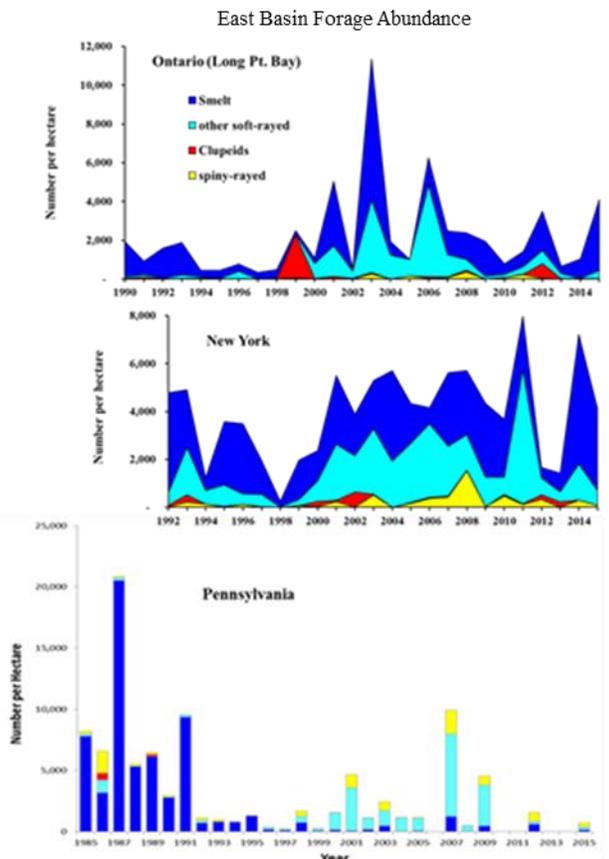
The lower trophic level monitoring (LTLA) program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize ecosystem change. In 2015, measures of total phosphorus remained above target levels in the western basin but near or within targets in the central and eastern basins. 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.

## East Basin Status of Forage

Rainbow Smelt are the principal prey fish species of piscivores in the offshore waters of eastern Lake Erie and the most abundant forage species in most years. In 2015, Rainbow Smelt were the most abundant forage species in Ontario and New York waters of the East Basin. Young-of-the-year density in the Ontario trawl program was the highest since 2003 (3245/ha) and age-1+ density was the highest since 2009 (411/ha). In the New York survey, age-0 density (2856/ha) was down from a record high in 2014 but remained well above average. Yearling-and-older density in New York increased to 575/ha from low numbers in 2014. In Pennsylvania waters, both age-0 (108/ha) and age-1+ (35/ha) densities were much lower than in the other jurisdictions. The densities of most non-Rainbow Smelt forage species were below average in 2015, including Trout-Perch, White Perch, Alewife and Spottail Shiner. Emerald Shiner shades were generally below average except for age-0 in Ontario. Gizzard Shad density increased to above average levels in Ontario and Pennsylvania. Round Goby density increased in all surveys and was above average in Ontario nearshore surveys. Predator diets were dominated by fish species, primarily Rainbow Smelt and Round Goby. Predator growth remains good. However, over the last 6- or 7-year period, a moderate decreasing trend in size at age is evident among a few age groups of Smallmouth Bass in Ontario. Lake Trout size-at-age remains stable and among the highest observed in the Great Lakes.

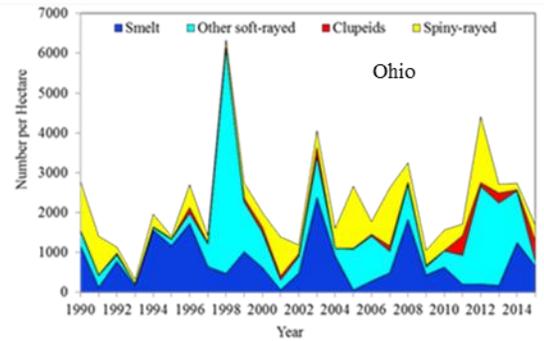
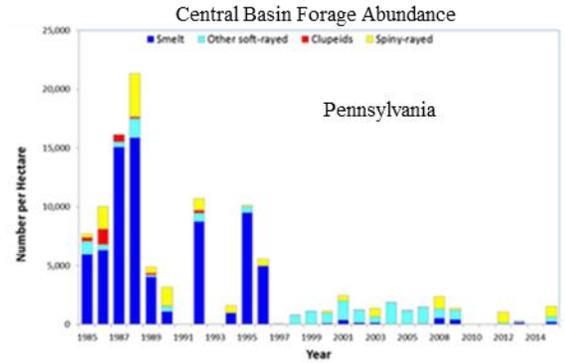


Mean total phosphorus in each basin of Lake Erie, 1999-2015. Target trophic ranges are in yellow.



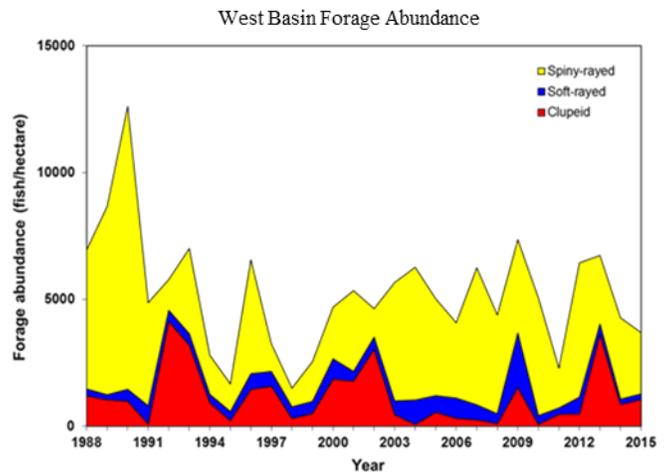
### Central Basin Status of Forage

In 2015, overall forage abundance in Ohio waters declined from 2014 and was below the long term average for the 26 year survey. The largest declines were in the Rainbow Smelt and soft-rayed groups (primarily Emerald Shiners). The clupeid and spiny-rayed groups did increase from 2014, but the increase was not enough to offset the sharp declines in Rainbow Smelt and soft-rayed groups in Ohio. In Pennsylvania, Rainbow Smelt were the primary forage species prior to 1998, when Round Goby entered the system and became the primary soft-rayed forage species. Recently, spiny-rayed species, age-0 White Perch and age-0 Yellow Perch have been the most abundant forage group in Pennsylvania. Round Goby age-0 and age-1+, Ohio West indices increased from 2014 and were above average, while Ohio East indices decreased from 2014 and were below average. The Pennsylvania age-0 index was above average, while the age-1+ index was below average. Gizzard Shad indices from 2015 were the highest in the time series in Pennsylvania and Ohio East, and second highest in Ohio West. Adult Walleye diets (by dry weight) were primarily Gizzard Shad and to a lesser extent Emerald Shiner.



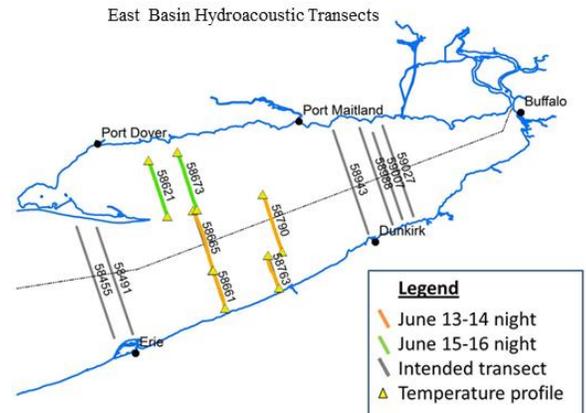
### West Basin Status of Forage

In 2014, hypolimnetic dissolved oxygen levels for all sampled sites remained above the 2 mg per liter threshold during the August trawling survey. In total, data from 70 sites were used in 2014. Total forage abundance was below average in 2015, the second year of decline. Clupeid catches were highest near Sandusky Bay and Point Pelee. Soft-rayed fish were most abundant near Pelee Island. Spiny-rayed abundance was distributed relatively evenly throughout the basin. Young-of-the-year Yellow Perch (494/ha) decreased relative to 2014, while age-0 Walleye abundance (84/ha) increased sharply; both were well above long-term means. Catches of Round Goby (43.7/ha) increased from 2013, but still represent the fourth lowest abundance since their discovery 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 2015 (new moon on July 16<sup>th</sup>), the east basin acoustic survey was conducted from July 13 to 16 on 6 of 12 planned transects, the central basin survey from July 13-17, and the west basin survey from July 13-22. Thirteen acoustic transects, 48 temperature and dissolved oxygen profiles and 36 midwater trawls were sampled in total during the 2015 surveys. Hydroacoustic density estimates of age-0 Rainbow Smelt were the largest in the last five years in the central basin. Western basin forage fish density and biomass estimates were high in 2015, averaging 54,309 fish per hectare and 22 kg per hectare. East basin acoustic data collected in 2015 have not been processed or analyzed.



### 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. Progress on this charge in 2015 included drafting of a priority list of species likely to become invasive in Lake Erie. The task group also endorsed the applications of biologists from Fisheries and Oceans Canada/Pêches et Océans Canada and the US Fish and Wildlife Service for membership on the task group. Both federal biologists are experts in early detection and monitoring for aquatic invasive species and are actively working in Lake Erie. Work on creating the database will take place in 2016. In addition, the Forage Task Group updated the LEC Asian Carp Fact Sheet for 2015.