

FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2015



Introduction

The Lake Erie Committee Forage Task Group report addresses progress made in 2014 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. Continue the development of an experimental design to facilitate forage fish assessment and standardized interagency reporting.

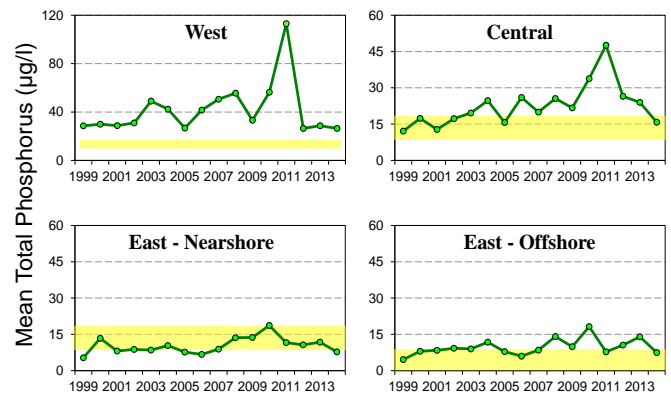
The complete report is available from the Great Lakes Fishery Commission's Lake Erie Committee Forage Task Group website (<http://www.glfrc.org/lakecom/lec/FTG.htm#pub>) or upon request from an LEC, STC, or FTG representative.

Interagency Lower Trophic Level Monitoring

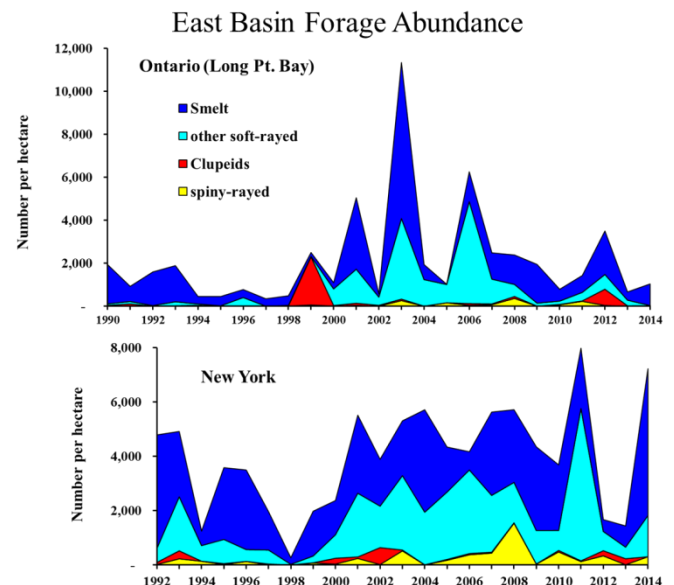
The lower trophic level monitoring (LTLA) program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize ecosystem change. In 2014, measures of total phosphorus remained above target levels in the western basin but near or within targets in the central and 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 in 2014, Smelt (all ages) once again was the most abundant forage species captured in east basin jurisdictions. The basin-wide increase was largely due to strong recruitment of the 2014 year class, which produced record high numbers of age-0 Smelt in New York and above average numbers in Ontario. Yearling and older (age 1+) Rainbow Smelt abundance decreased in 2014 to record low density in Ontario's 31-year trawl index time series (4.6/ha) and second lowest density in New York's (24.2/ha) 23-year trawl survey history. Mean length of age-0 (54 mm FL) and age-1 (103 mm FL) Rainbow Smelt decreased slightly in 2014; yearlings were about average length, whereas age-0 smelt were the third smallest observed in Ontario's trawl assessment. The contribution of non-smelt fish species to the forage fish community of eastern Lake Erie was dominated in 2014 by Emerald Shiner, Round Goby, and Trout-Perch in New York and by Round Goby in Ontario. Numeric abundance of these forage fish species in 2014 were below average except for Emerald Shiners, which ranked third highest since 1992 in New York's trawl survey (1315/ha, all ages). In sharp contrast, Emerald Shiners (all ages) were far less abundant in Ontario (5.4/ha, all ages) where the 2014 abundance index ranked second lowest since 1992. 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. Lake Trout size-at-age remains stable and among the highest observed in the Great Lakes.

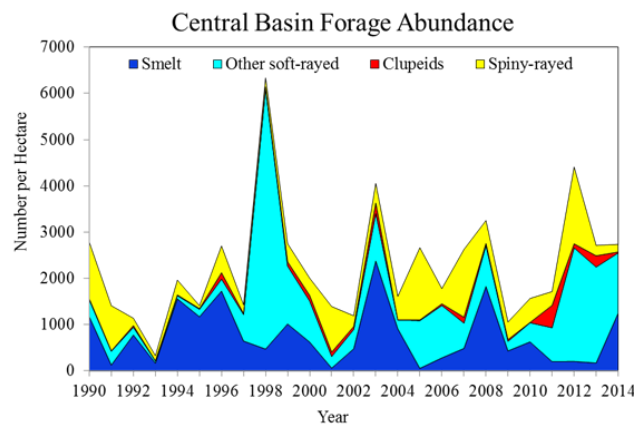


Mean total phosphorus in each basin of Lake Erie, 1999-2014. Target trophic ranges are in yellow.



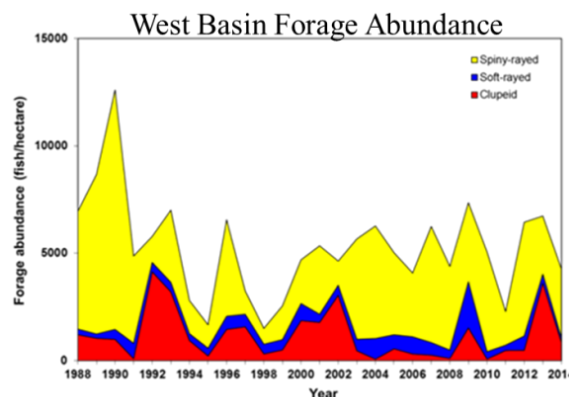
Central Basin Status of Forage

In 2014, overall forage abundance in the Ohio waters was similar to forage densities in 2013, and were above average for the 25-year survey. Declines in the soft-rayed and clupeid forage groups were offset by an increase in the density of Rainbow Smelt. Within the spiny-rayed group an increase in age-0 Yellow Perch densities offset a decrease in age-0 White Perch from 2013. Young-of-the-year Rainbow Smelt indices increased in Ohio waters from 2013, and were almost 3 times higher than average. In 2014, age-0 Emerald Shiner indices were the second (Ohio West) and third (Ohio East) highest in the 10-year time series. Density of both age-0 and age-1+ Round Goby has been below average since 2012 in Ohio waters. Gizzard Shad indices were well below average and age-0 Alewives were not encountered in 2014 surveys. Adult Walleye diets (by dry weight) were primarily Gizzard Shad and to a lesser extent Emerald Shiner.



West Basin Status of Forage

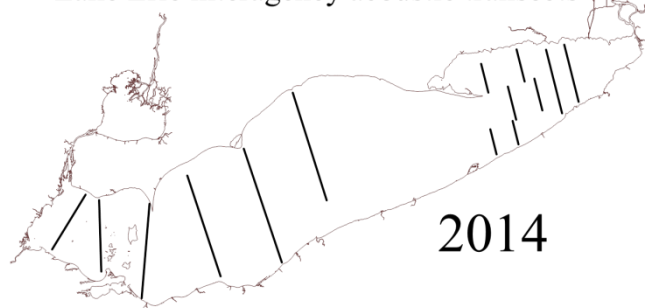
In 2014, hypolimnetic dissolved oxygen levels for all sampled sites remained above the 2 mg per liter threshold during the August trawling survey. In total, data from 70 sites were used in 2014. Total forage abundance was below average in 2014, and 36% lower than 2013. Clupeid catches were highest along the south shore around Sandusky Bay. Soft-rayed fish were most abundant near the mouth of the Detroit River and east of Pelee Island. Spiny-rayed abundance was highest in the center of the basin. Young-of-the-year Yellow Perch (859.6/ha) increased sharply relative to 2013 while age-0 Walleye abundance (29.1/ha) tripled; both are above or near 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 2014 (new moon on July 26th), the east basin acoustic survey was conducted from July 24 to August 2, the central basin survey from July 21-24, and the west basin survey from July 21-25. Fourteen acoustic transects, 41 temperature and dissolved oxygen profiles and 21 midwater trawls were sampled in total during the 2014 basin surveys. Emerald Shiner and age-0 Rainbow Smelt tended to be uniformly distributed across the central basin on all three transects. Western basin forage fish density and biomass estimates were moderate in 2014, averaging 12,594 fish per hectare and 19 kg per hectare. East basin acoustic data collected in 2014 have not been processed or analyzed.

Lake Erie interagency acoustic transects



Hemimysis anomala

The Forage Task Group continued to record sightings of this exotic invertebrate in 2014. Native to the Black and Caspian Seas, this recent invader was first located in Lake Erie in 2006, and has the potential to alter lake foodwebs as both a food item and a consumer of zooplankton resources. Diet analysis of 2014 Long Pointe Bay index gillnet samples found 7.3% of non-empty White Perch stomachs examined contained *H. anomala*, down noticeably from the series high 24% in 2013. Occurrences of *H. anomala* in White Perch diets tend to increase from west to east. Yellow Perch from central and western locations are known consumers of *H. anomala* however there have been no observations from eastern locations. In 2014, a single Yellow Perch from each of the central (ODNR surveys) and western (USGS-LEBS) surveys contained *Hemimysis anomala*.

