

FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2013



Introduction

The Lake Erie Committee Forage Task Group report addresses progress made in 2012 on four charges:

1. Continue to describe the status and trends of forage fish and invertebrates in each basin of Lake Erie.
2. Continue the development of an experimental design to facilitate forage fish assessment and standardized interagency reporting.
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. Continue the interagency lower-trophic food web monitoring program to produce annual indices of trophic conditions which will be included with the annual description of forage status.

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.

East Basin Status of Forage

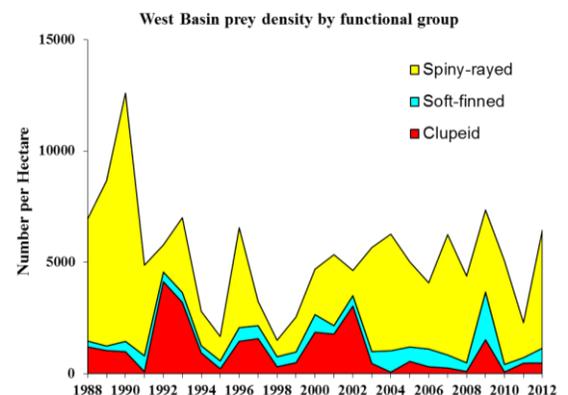
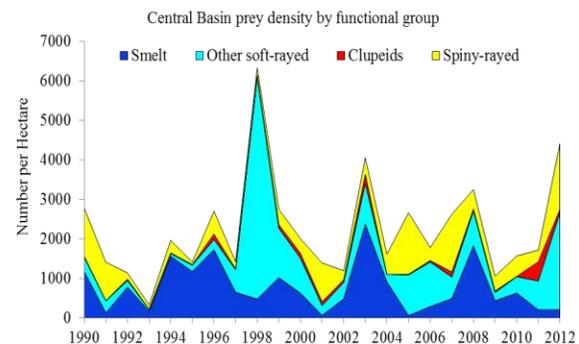
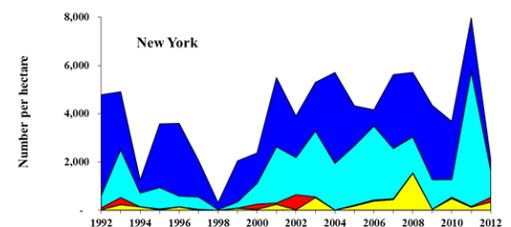
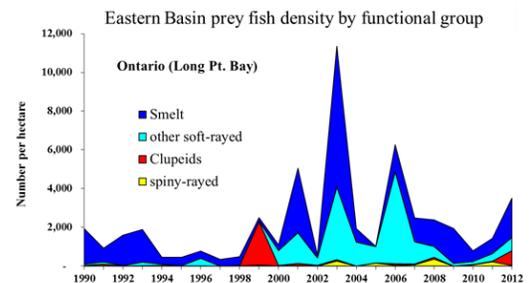
Total prey fish species abundance was high in Ontario, but below average in New York. Rainbow smelt was again the most abundant prey species. Age-0 rainbow smelt abundance increased 2.5-fold in Ontario, but decreased 74% in New York. Yearling-and-older (YAO) rainbow smelt were less abundant than age-0 smelt and densities were similar to (Ontario) or well below (New York and Pennsylvania) agency 10-year averages. Age-0 and -1 rainbow smelt mean fork length increased in 2012; both age groups were above average size. The contribution of non-smelt fish species to the forage fish community of eastern Lake Erie was dominated by alewife, emerald shiner, trout-perch, round goby, and age-0 yellow perch. Age-0 alewife abundance was above average across all east basin jurisdictions and the second highest in Ontario's index trawl series. Round goby densities increased slightly in 2012 but remains well below the 10-year average in all east basin jurisdictions. Predator diets were dominated by rainbow smelt and round goby. Predator growth remains good. Age-2 to age-6 smallmouth bass were above average size. Lake trout size-at-age remains stable and among the highest observed in the Great Lakes.

Central Basin Status of Forage

In the central basin, overall forage abundance in 2012 increased from 2011 and was well above average. The increase can be attributed to basin wide increases in age-0 white perch and increases of age-0 and YAO emerald shiners in Ohio. A strong year class of yellow perch occurred in all areas of the central basin in 2012, with the strongest cohort in Pennsylvania. Round goby indices for both age-0 and YAO were below average. The age-0 gizzard shad index in western Ohio decreased from a record high in 2011 and was below average. The eastern Ohio index increased from 2011 and was above average. The proportion of gizzard shad in the diets of adult walleye and white bass dramatically increased from 2011 in eastern Ohio samples. Rainbow smelt were absent in diet samples from eastern Ohio. Mean length of walleye in 2012 was above average up to age-6.

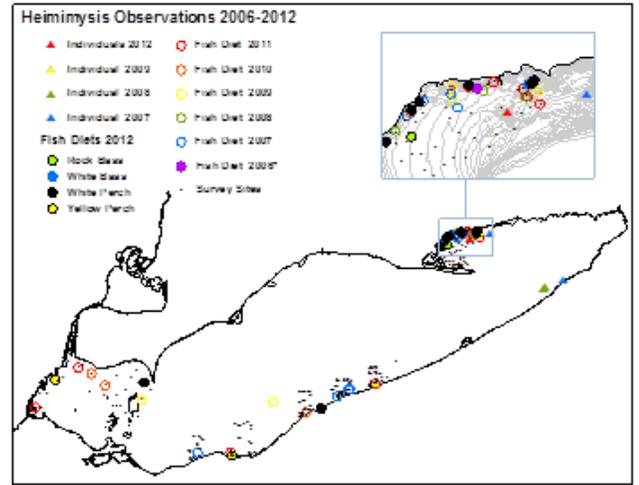
West Basin Status of Forage

Low levels of dissolved oxygen at the bottom of the water column during the August survey were not an issue in 2012, representing the first time since 2008 that no sites were excluded from analysis due to DO levels. Total forage abundance increased to above-average levels in 2012, mainly attributed to increases in soft-finned and spiny-rayed fish groups. Clupeid densities were similar to 2011. Mean length of most age-0 sport fish were at or well above long-term averages. Spatial abundance contours showed soft-rayed fish were most abundant near the mouth of the Detroit River and east of Sandusky Bay, spiny-rayed abundance was highest at the center of the basin, and clupeid densities were highest around Sandusky Bay. Walleye diets were predominantly gizzard shad. Benthic invertebrates were the primary component of yellow perch diets in spring and fall.



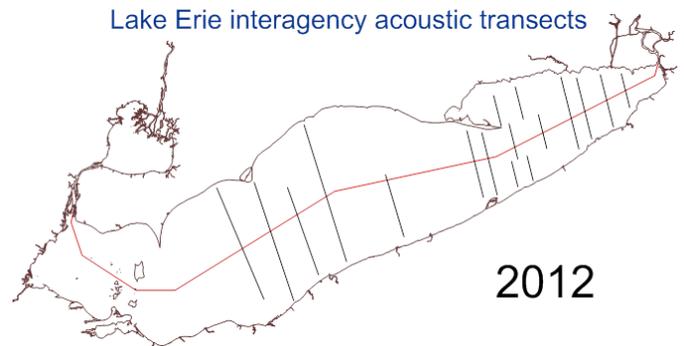
Hemimysis anomala

The Forage Task Group continued to record sightings of this exotic invertebrate in 2012. 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. In 2012, *H. anomala* continued to be found in the diets of white perch (10%) and rock bass (2%) in Long Point Bay (LPB), and in yellow perch and white perch in central and western basin waters. Occurrences of *H. anomala* in white perch diets tend to increase from west to east. *Hemimysis anomala* were first observed in white bass in LPB in 2010 (1% of fish examined). Absent in 2011, they were again observed in white bass in 2012 (3%). The first and only observation of consumption by white bass west of LPB was from one individual captured near Fairport OH, in 2011. Swarms of *H. anomala* were recorded 6.5 km offshore during underwater video surveillance of Nanticoke Shoal in the fall of 2012; the first noted occurrence beyond the nearshore of the eastern basin.



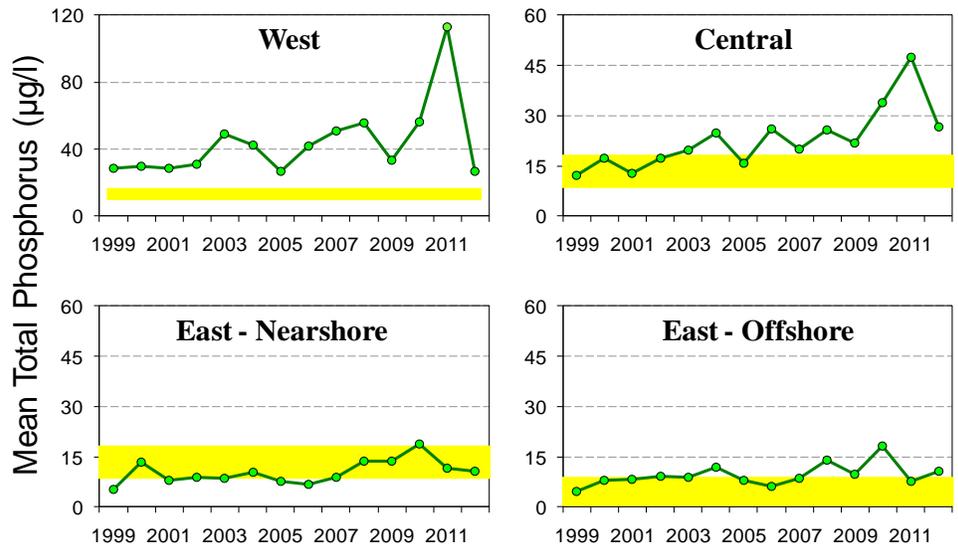
Hydroacoustic Assessments

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. 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 2012, the east basin acoustic survey was conducted from July 15-25. The central basin survey was conducted from July 16-22. The west basin was not surveyed in 2012 due to equipment malfunctions. Seventeen acoustic transects, 51 temperature and dissolved oxygen profiles and 36 midwater trawls were sampled in total during the 2012 basin surveys. Yearling-and-older size acoustic targets (all forage fish species) were found in high densities throughout the east basin, with the greatest concentrations in the warm water layer. In the central basin, emerald shiner and Age-0 rainbow smelt densities were high throughout the basin and YAO rainbow smelt were highest in the east and west transects.



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 2012, measures of total phosphorus remained above target levels in both the western and central 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 and nearshore eastern basin waters are within targeted mesotrophic status, which favors percid production. The offshore eastern basin waters remain near targeted oligotrophic status. Low hypolimnetic dissolved oxygen continues to be an issue in the central basin during the summer months, and an occasional problem in the western basin. The zooplanktivory index indicates that predation on zooplankton is low in both the western and central basins, and average in the eastern basin.



Mean total phosphorus in each basin of Lake Erie, 1999-2012.