FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2011

Lake Erie Committee

REPRESENTING THE FISHERY MANAGEMENT AGENCIES OF LAKE ERIE AND LAKE ST. CLAIR

Introduction

The Lake Erie Committee Forage Task Group report addresses progress made in 2010 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

Low (Ontario) to moderate (New York) abundance of eastern basin forage fish species during 2010 was largely attributable to rainbow smelt. Age-0 rainbow smelt abundance increased in 2010, were captured in greater numbers than yearling-and-older (YAO) rainbow smelt and densities of both age groups were higher in New York than in Ontario trawl assessments. Size of age-0 and age-1 rainbow smelt increased in 2010. The contribution of non-smelt fish species to the forage fish community of eastern Lake Erie was dominated by trout-perch, round goby, emerald shiner, and age-0 white perch. Round goby densities decreased throughout eastern Lake Erie, reaching the lowest level observed in Ontario and second lowest in New York since 2000. A moderately strong showing of age-0 yellow perch in 2010 marks a significant improvement from last year's very weak year class. Predator diets were dominated by fish species, primarily rainbow smelt and round goby. Predator growth remains good. Age-2 to -6 smallmouth bass were above average size in sampled east basin populations. 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 was low to moderate throughout the basin during 2010. Recruitment of age-0 forage species was generally higher than in 2009. However, YAO indices declined due to poor recruitment of most forage species in 2009. The only notable increases in forage indices were for age-0 rainbow smelt in western Ohio and age-0 and YAO emerald shiner in eastern Ohio. Round goby abundance is above average in western Ohio and below average in eastern Ohio. Walleye and white bass diets continue to be comprised of gizzard shad, rainbow smelt and emerald shiners. Gizzard shad and emerald shiners, when combined, contributed 92% of the diets in western Ohio and 77% of the diets in eastern Ohio. Rainbow smelt comprised the remaining proportion of walleye diets. Round gobies continue to be important diet items to white bass and yellow perch in June and August, and are a primary component of smallmouth bass diets sampled in the fall. Mean size of walleye and white bass collected in 2010 was above average for fish up to age-3. Mean size of most forage species remains above average.

West Basin Status of Forage

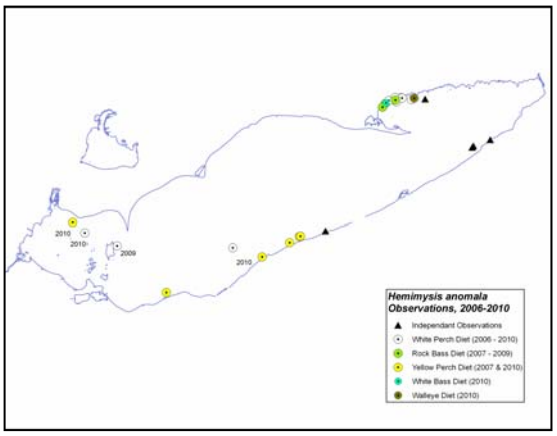
Low levels of dissolved oxygen at the bottom of the water column during the August survey affected 13 of 71 trawl locations in the west basin survey. Indices for most species declined in 2010. There were dramatic decreases in abundance of gizzard shad and rainbow smelt relative to 2009. Age-0 yellow perch, emerald shiner and YAO emerald shiner also decreased from 2009 and were below average. Age-0 walleye abundance increased from 2009 but was below average. White bass recruitment declined slightly from 2009, but was above average. Age-0 smallmouth bass abundance was the fourth highest in the time series. Age-0 white perch increased to the sixth highest index since 1988. Round Goby abundance decreased for the third consecutive year and was the lowest since 1997, the first year of occurrence in the west basin. Size of age-0 walleye, yellow perch, white bass, white perch, and smallmouth bass is above average. Walleye diets collected from fall gillnets were predominantly gizzard shad and emerald shiner. Benthic invertebrates were the primary component of yellow perch diets in spring and fall.

Interagency Standardization

Forage Task Group members from the east and central basin began planning a trawl comparison exercise for assessment vessels in either 2011 or 2012. This exercise would be similar to the one that took place in 2003 for west and central basin agencies, with the goal of developing fishing power correction formulas to standardize assessment catches lake-wide.

Hemimysis anomala

The Forage Task Group continued to record sightings of this exotic invertebrate in 2010. 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 2010, *Hemimysis anomala* continues to be found in the diets of white perch and rock bass, although consumption rates declined in 2010. *Hemimysis anomala* was also found for the first time in white bass and walleye samples from Long Point Bay. Two new occurrences of *H. anomala* were found in yellow perch, one each in the central and west basins. Also in 2010, *H. anomala* was found in the diet of a white perch east of Pelee Island, the first occurrence in open water.

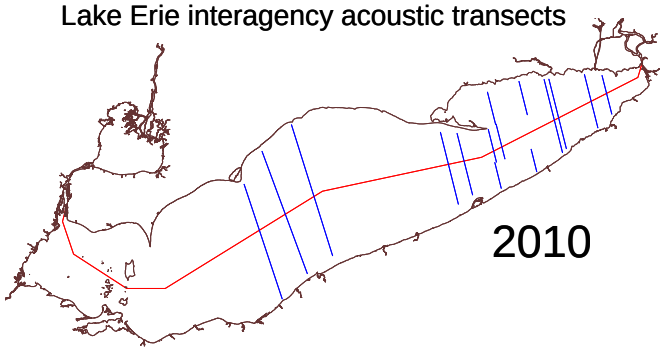


Distribution of *Hemimysis anomala* observations in Lake Erie, 2006 – 2010.

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.

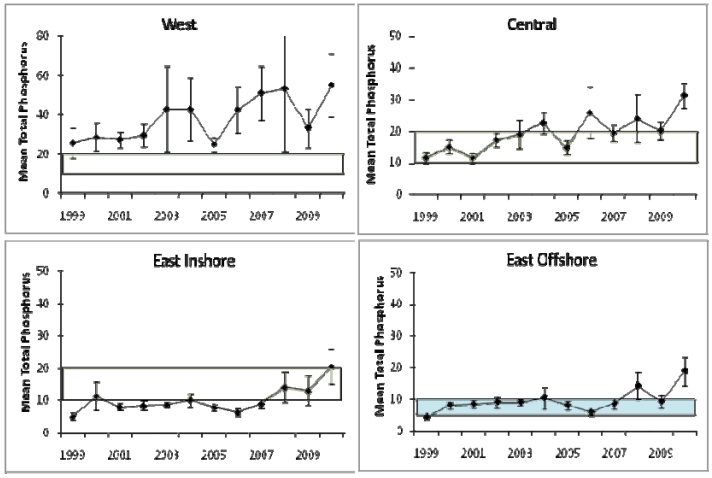
Lake Erie interagency acoustic transects



Interagency Lower Trophic Level Monitoring

The lower trophic level monitoring (LTLA) measures nine variables at 18 stations around Lake Erie to characterize ecosystem change. The last 12 years of data are summarized. The 2010 median surface temperature was below the long-term median in the west basin and slightly above the long-term median in the central and east basins. The central basin hypolimnion continues to have very low oxygen levels in August and September. Mean total phosphorus increased in all basins in 2010. The fish community objective for phosphorus was exceeded in the west, central and offshore east basins, but within target for the nearshore east basin. Zooplanktivory, a measure of zooplankton predation by fish, was high throughout Lake Erie historically, but has been low in the west and central basins for the last three years.

Phosphorus levels in each basin of Lake Erie, 1999-2010 (shaded areas are the Lake Erie Fish Community targets).



Mean hypolimnetic dissolved oxygen levels in central basin, Lake Erie, 1999-2010.