FORAGE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2012

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 2011 on four charges:

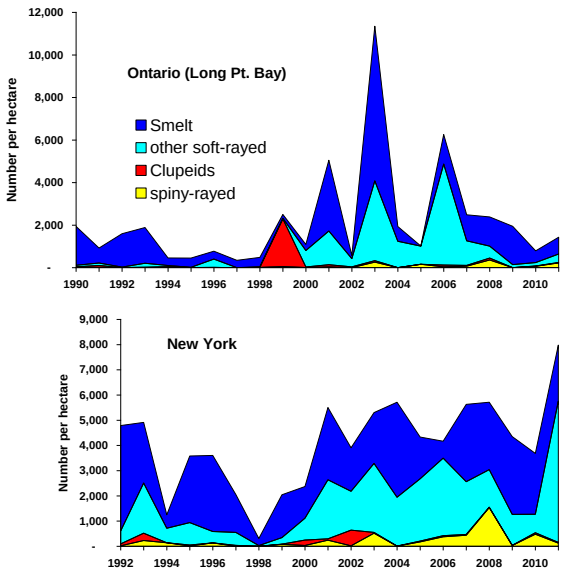
1. Continue to describe the status and trends of forage fish and invertebrates in each basin of Lake Erie.
2. Continue the development of an experimental design to facilitate forage fish assessment and standardized interagency reporting.
3. Continue hydroacoustic assessment of the pelagic forage fish 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

Maximum abundance of eastern basin prey fish species in New York waters during 2011 was largely attributable to record high numbers of emerald shiners. Total prey fish species abundance was below average in Ontario and was predominately rainbow smelt. Age-0 rainbow smelt abundance increased in 2011 and catch rate of this prey fish was about three times greater in New York than Ontario. Yearling-and-older (YAO) rainbow smelt were less abundant than age-0 smelt and densities were below (ON) or similar (NY) to agency time-series averages. Age-0 rainbow smelt mean fork length decreased in 2011 and mean length of age-1 smelt was similar to last year; both age groups were below average size. The contribution of non-smelt fish species to the forage fish community of eastern Lake Erie was dominated by emerald shiner, trout-perch, round goby, and age-0 yellow perch. Round goby densities increased in Ontario and remained about the same in New York in 2011; goby densities remain below average in offshore waters of the east basin. 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.

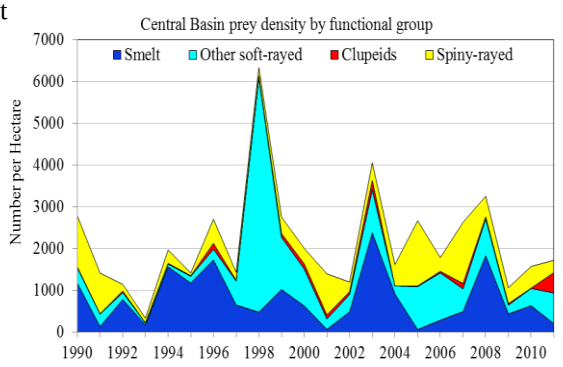
Eastern Basin prey fish density by functional group



Central Basin Status of Forage

In the central basin, overall forage abundance in 2011 increased from 2010 but was below average. Rainbow smelt and emerald shiner indices were below average for both age-0 and YAO in most of the basin. Round goby indices in 2011 increased basin wide for both age-0 and YAO age groups compared to 2010. In most areas of the central basin, round goby indices were well above average and were some of the highest indices in the time series. Gizzard shad abundance in western Ohio increased to a record high density in 2011. Walleye and white bass diets in the fall continue to be comprised of gizzard shad, rainbow smelt and emerald shiners. Mean length of walleye up to age-6 collected in Ohio's fall gillnet survey have been above average since 2009, and this trend continued in 2011. Mean size of most age-0 forage and predator species declined from 2010, but remained at or above average.

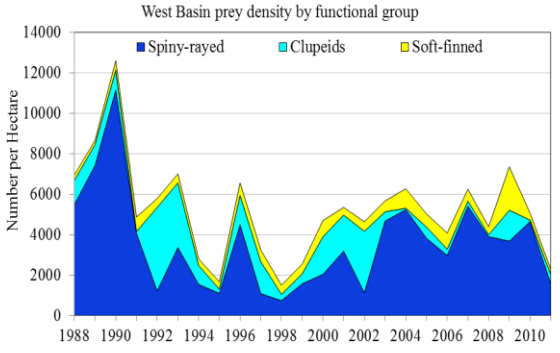
Central Basin prey density by functional group



West Basin Status of Forage

Low levels of dissolved oxygen at the bottom of the water column during the August survey have been observed over the last three years. An interim policy was adopted whereby bottom trawls that occurred in areas with low oxygen levels would be excluded from analysis. In 2011, total forage abundance declined to the lowest level since 1999. Declines in soft-finned and spiney-rayed fish were responsible for this trend. Clupeids densities increased 6-fold compared to 2010. Mean length of most age-0 sport fish decreased compared to 2010, but were near long-term averages. Spatial abundance contours showed soft-rayed fish were most abundant near the mouth of the Detroit River. Spiny-rayed abundance was highest at the mouth

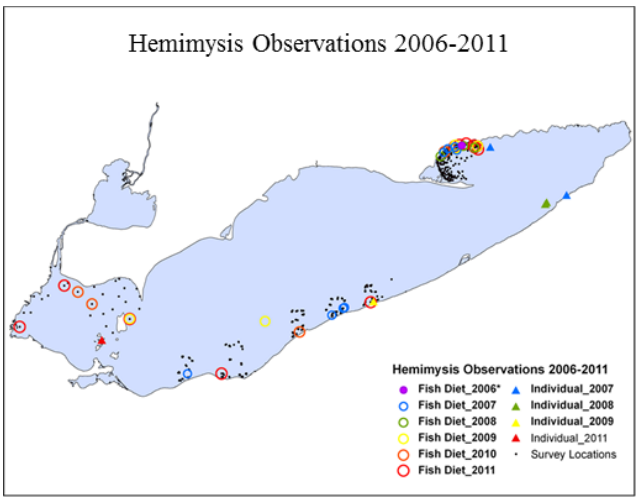
West Basin prey density by functional group



of the Detroit River (driven by a high age-0 yellow perch catch at one site in Ontario), but fairly well spread across the west and south portions of the basin. Walleye diets collected in fall gillnets were predominantly gizzard shad. Benthic invertebrates were the primary component of yellow perch diets in spring and fall.

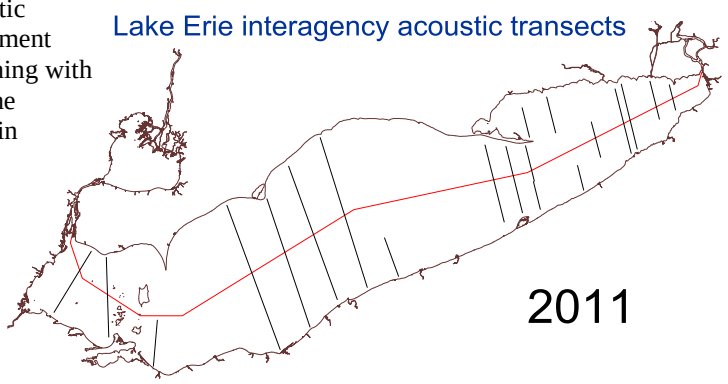
Hemimysis anomala

The Forage Task Group continued to record sightings of this exotic invertebrate in 2011. 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 2011, H. *anomala* continues to be found in the diets of white perch and rock bass in Long Point Bay, and in yellow perch and white perch in central and western basin waters. Occurrences of *H. anomala* in white perch diets increased from west to east. *Hemimysis anomala* was also found for the first time in fish diets from Michigan waters, the most western reports to date. In addition to fish diets, a single *H. anomala* was observed in a zooplankton sample collected near Middle Bass Island, in 2011.



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 2011, the east basin acoustic survey was conducted from July20-28. The central and west basin surveys were conducted from July 5-8. Over 600 km of acoustic data were collected among the three surveys.



Interagency Lower Trophic Level Monitoring

The lower trophic level monitoring (LTLA) program measures nine variables at 18 stations around Lake Erie since 1999 to characterize ecosystem change. In 2011, measures of total phosphorus increased to very high levels in both the western and central basins. Water transparency was below targets in the western basin but within targets elsewhere. Trophic class measures indicate that the western basin is nearing hyper-eutrophic status, which favors species such as bass, sunfish, and carp. The central and nearshore eastern basin waters are within targeted mesotrophic status, which favors percid production. The offshore eastern basin waters are within 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, 1999-2011.