Forage Task Group
Executive Summary Report
March 2008

Introduction

This year's Lake Erie Committee Forage Task Group report addresses progress made by the task group on five 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 eastern and central Lake Erie, incorporating new methods in survey design and analysis as necessary to refine these programs. Promote the development of an acoustic survey for western Lake Erie.
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.
5. Reassess the bioenergetics model's status and its data needs.

The complete report is available from the Great Lakes Fishery Commission's, Lake Erie Committee Forage Task Group website at http://www.glfc.org/lakecom/lec/FTG.htm

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East Basin Status of Forage

Moderate abundance of eastern basin forage fish species during 2007 was largely due to rainbow smelt and record high densities of round goby (primarily age-0). Agency Fall trawl surveys characterized the 2007 rainbow smelt year class as being moderate to strong. Yearling and older smelt were below average abundance throughout eastern Lake Erie, except in Pennsylvania (above average abundance). Age-0 clupeids and all ages of emerald shiner decreased in most regions.

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 east basin populations examined from Long Point Bay, Ontario and New York waters. Juvenile walleye (New York) in 2007 were slightly below (age-1 fish) and near (age-2 fish) long-term average TL. 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 for age-0 and YAO increased from 2006. The increase in forage abundance was apparent in both East and West areas of the basin and due to exceptionally large age-0 yellow perch, white perch, gizzard shad and round goby indices that increased to near record levels relative to the ten year time series. Age-0 rainbow smelt indices also increased in all areas of the central basin, but remain generally below the ten year mean.

Walleye diets in the East portion of the basin continued to show a strong presence of emerald shiner throughout the summer and into the fall. Diets in the western areas were primarily gizzard shad and emerald shiners. Yellow perch and white bass diets consisted primarily of chironomids in May and June with fish becoming the primary diet item during August September and October. Fish consumed by yellow perch were primarily round goby, while white bass consumed emerald shiners and gizzard shad. *Hemimysis anomala*, was found in the diets of five yellow perch caught in 2007.

West Basin Status of Forage

Increases in western basin forage abundance were notable for age-0 freshwater drum, white perch, yellow perch and walleye. Age-0 gizzard shad decreased from 2006, while alewife increased slightly; both remained well below long-term means. Numbers of all ages of round gobies increased for the second year in a row.

Adult and yearling walleye diets remained dominated by gizzard shad and emerald shiner. Yellow perch diets were dominated seasonally by zooplankton and invertebrates. Round gobies, emerald shiners, and trout-perch were notable fish components of yellow perch diets in fall samples. Lengths of age-0 walleye, yellow perch, white bass, and white perch slightly decreased in 2007 relative to 2006, while smallmouth bass lengths were up slightly.

Trawl Comparison

In 2008, ODNR, Scudder Mackey, and USGS plan to conduct tests to estimate bottom trawl dimensions using three types of assessment gear (side-scan sonar, BioSonics, and Notus) simultaneously. These tests will be similar to those run in 2006 by the MDNR.

Summary of Species CPUE Statistics

Interagency trawling has been conducted in Ontario, Ohio and Michigan waters of the western basin of Lake Erie in August of each year since 1987 to measure basin-wide recruitment of percids and forage species. Total forage abundance and biomass increased in 2007, reaching its highest level since 2004 and 1990, respectively. White perch recruitment in 2007 was responsible for much of this increase.

Trawl Comparison Exercise

The Forage Task Group is looking into the possibility of continuing the trawl comparison exercise to include the boats and agencies of the central and eastern basins. This would provide further improvement in coordination and integration of trawl surveys conducted throughout the basins of Lake Erie.

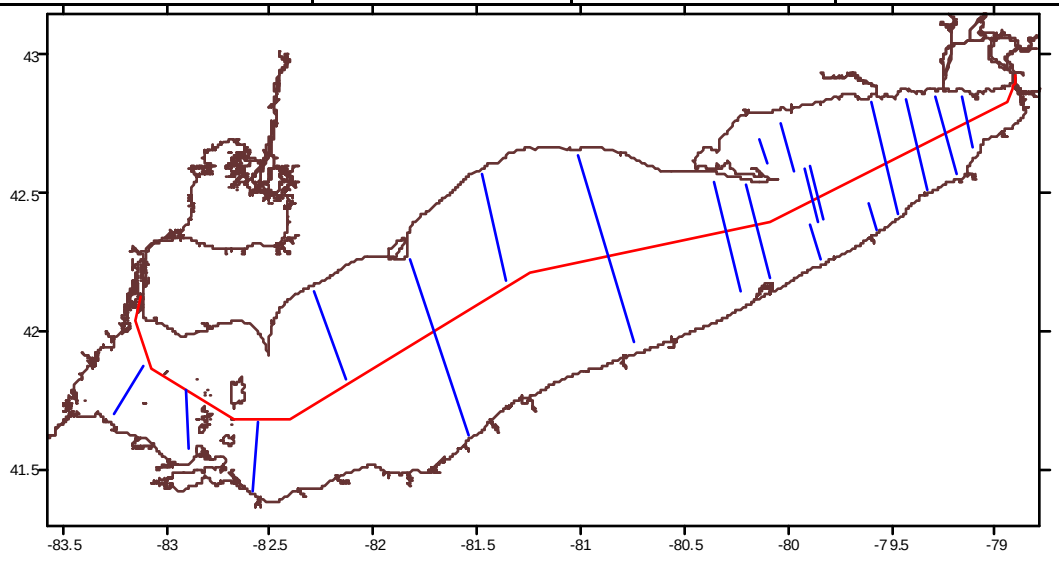
Hydroacoustic Assessments

The Forage Task Group introduced fisheries hydroacoustic technology to assess pelagic forage fish stocks in Lake Erie, beginning with surveys of the east basin in 1993, followed by more recent expanded coverage to the central (2000) and west (2004) basins. 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, and typically employs at least two agency research vessels, one to collect the electronic acoustic data, the other to obtain mid-water trawl catch samples.

Beyond maintaining the standardized July survey effort, the FTG has been very actively pursuing initiatives to address survey design and analysis procedures to maintain an up-to-date and defensible scientific method for the Lake Erie fisheries acoustic assessment program. Presentation of eastern basin acoustic survey results had been suspended while the principal investigators were immersed in other initiatives pertaining largely to data processing/analysis methods, software/hardware expansion/upgrades, and echosounder calibrations. New standard analysis procedures are being developed and will be eventually applied to the east basin 11-year series of split-beam acoustic data. Furthermore, upon completion of these new analyses, Forage Task Group acoustic survey investigators currently pursuing somewhat independent efforts in the eastern, central and western basins expect to integrate their analysis and reporting efforts to produce a lake wide July snapshot of pelagic fish density and distribution for Lake Erie.

The table and figure below provide a summary of the three Lake Erie basin acoustic surveys in 2007.

	2007 Acoustic Surveys by Basin		
Survey Descriptor	**West**	**Central**	**East**
Survey Period; (No. Nights)	July 24-25; (2)	July 9-19: (4)	July 9-17; (5)
No. Transects; (total km)	3; (74)	4; (233)	12; (319)
Echosounder - make / model	BioSonics DT-X	BioSonics DT-X	Simrad EY60
- beam type	Split beam	Split beam	Split beam
- frequency	201 kHz	129 kHz	120 kHz
Transducer; beamwidth	BioSonics; 6.8°	BioSonics; 6.9°	ES120-7c; 7 °
No. mid-water trawl samples	0	45	19
No. water temperature profiles	3	24	41
Approx. kilobytes recorded	602,811	1,327,000	1,527,000



Interagency Lower Trophic Level Monitoring Program

The lower trophic level monitoring (LTLA) measures nine variables at 18 stations around Lake Erie to characterize ecosystem change. The last nine years of data are summarized for five variables: epilimnetic temperature, hypolimnetic or bottom dissolved oxygen, grazing pressure (chlorophyll *a* and total phosphorous) and a planktivory index. Epilimnetic temperatures in 2007 were around average in the west basin, slightly above average in the central basin and slightly below average in the east basin. Average hypolimnetic DO was lower in the central basin in 2007 than in 2006, with about half of the observations being stressful to aquatic life in each year. In 2007 observed Chlorophyll *a* was much higher than predicted in the west basin and slightly lower than predicted in the central basin. Also in 2007, observed chlorophyll *a* was higher in the west basin than in 2006, but lower in the central and east basins. Zooplankton size increased in the west and east basin since 2004, indicating a decrease in planktivory in 2005 and 2006 (no data was available for the central basin).

Bioenergetics Model of Predator Consumption

Estimates of annual consumption by walleye were last completed by the bioenergetics sub-group in 2001. At that time, data limitations describing critical population parameters prevented the inclusion of other key lake predators in bioenergetics analysis. Progress on data collection to fill previous gaps includes information on lake trout populations, burbot age and growth, and steelhead diet, growth and population estimates.