

HABITAT TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2014



Introduction - The following provides a brief encapsulation of information presented in the annual report of the Lake Erie Committee (LEC) Habitat Task Group (HTG). The complete report is available from the GLFC's Lake Erie Committee Habitat Task Group website at <http://www.glfc.org/lakecom/lec/HTG.htm>, or upon request from an LEC, Standing Technical Committee (STC), or HTG representative.

Four charges were addressed by the HTG during 2013-2014: (1) Document habitat related projects. Identify and prioritize relevant projects to take advantage of funding opportunities; (2) Assist member agencies with the use of technology (i.e., sidescan, GIS) to better understand habitat in Lake Erie; (3) Support other task groups by compiling metrics of habitat use by fish; and (4) Develop strategic research direction for Environmental Objectives.

Task 1: Project Documentation – Information pertaining to habitat related initiatives taking place throughout the Lake Erie and Lake St. Clair basins is compiled and made available as an interactive “clickable map” which allows for geographic sorting of projects (by watershed or lake basin). You can access the spatial inventory of projects at: www.glfc.org/lakecom/lec/spatial_inventory/inventoryindex.htm. Details of many notable projects can be found in the HTG Full Annual Report. The HTG is also developing a ‘wish-list’ of potential research and enhancement projects for this charge, which will be integrated into the spatial inventory. The HTG anticipates that organizations looking for gaps in information needs and opportunities to fund this type of work should find this list useful.

Central Basin Hypoxia, Lake Erie – Research examining the dynamic nature of hypoxia, and its influence on fish distributions, continued in 2013. Temperature/dissolved oxygen loggers were deployed to quantify temporal variability of oxygen in the hypolimnion. Results displayed patterns that were contrary to common perception of hypoxia; that hypoxic episodes were frequent and often accompanied by rapid changes in temperature (Figure 1). Water quality sampling and examining fish distributions (by trawling and acoustics) suggests that hypoxic areas are spatially variable, and that fish concentrate in the edges of hypoxia. This hypoxia-based habitat compression may have significant influences on percid recruitment models, and requires additional research.

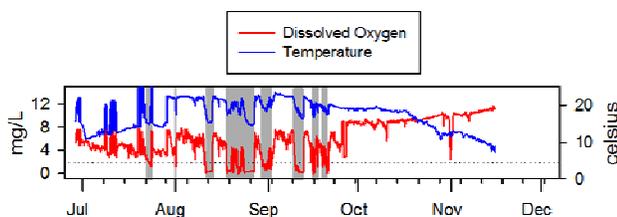


Figure 1. Temperature and dissolved oxygen time series recorded in 14m of water in Lake Erie off of Fairport Harbor, OH, 2013. The grey shaded areas represent when hypoxic conditions (DO<2mg/L) were present.

Fighting Island Reef, Detroit River – The Fighting Island Reef was originally constructed in 2008. Egg

and larvae sampling has documented the reef as a known Lake Sturgeon spawning location, particularly along the portion of the reef near the island (Figure 2). Due to the offshore portion of the reef infilling with sand, an extension was constructed immediately downstream of the functional portion in 2013 by the Ontario Ministry of Natural Resources. Egg and larval monitoring is planned for 2014.

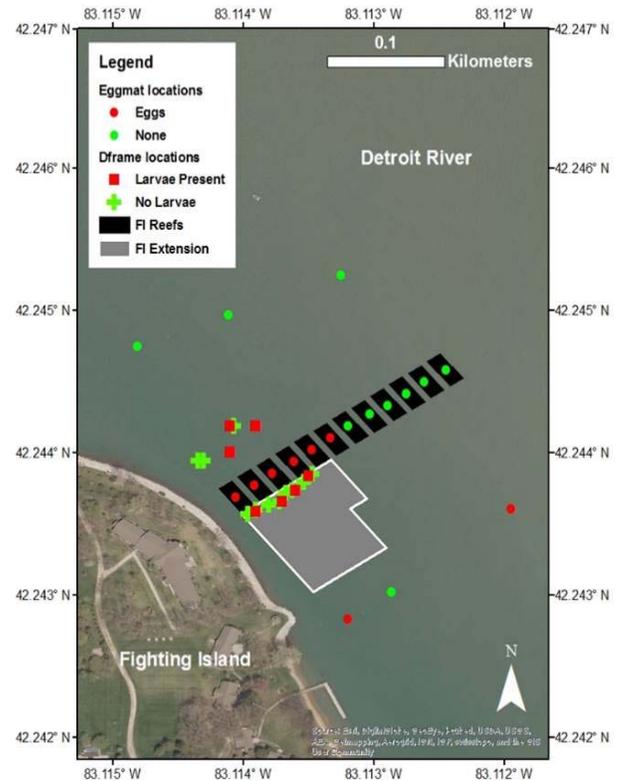


Figure 2. Lake Sturgeon egg and larvae sampling and 2013 extension at the Fighting Island Reef, Detroit River.

Task 2: Use of Technology

Sidescan Sonar Workshop – The Habitat Task Group (HTG) has identified the use of sidescan technology as an increasingly popular and important tool for evaluating habitat in aquatic systems. Sidescan has been used on Lake Erie to map substrate distributions, target potential Lake Trout spawning habitat, and evaluate habitat in the nearshore.

Integrated sidescan systems have become more affordable, and many agencies around Lake Erie have begun using these systems to collect data. The HTG encourages these activities, but understands that integrated sidescan systems may perform differently at various depths, ranges, and frequencies compared to traditional, stand-alone systems. To promote the use of the technology and share information on the implementation of these systems, the HTG has initiated a planning exercise to establish guidelines for collecting, processing, and analyzing sidescan data in Lake Erie. This exercise will provide the HTG the opportunity to develop guidance documentation identifying recommended sidescan sonar systems and setting for particular data collection needs with plans to hold a workshop for those interested in the technology.

Great Lakes Aquatic Habitat Framework (GLAHF) and the Lake Erie GIS – The Lake Erie GIS has been incorporated into a larger initiative, the Great Lakes Aquatic Habitat Framework (GLAHF). The GLAHF is a GIS database of geo-referenced data for Great Lakes coastal, large rivermouth, and open water habitats. The goal of the GLAHF is to develop provide access to a Great Lakes aquatic habitat database and classification framework to provide a consistent geographic framework to integrate and track data from habitat monitoring, assessment, indicator development, ecological forecasting, and restoration activities across the Great Lakes. Data from the Great Lakes GIS is being incorporated into the GLAHF.

The GLAHF project currently is focused on identifying, acquiring, and geoprocessing biological data, especially fish community data, and data collected in recent surveys of nearshore areas (Environment Canada, U.S. EPA, state DNRs, USGS). The other ongoing effort is focused on developing an ecological habitat classification. Using coastal and offshore spatial processing zones and a gridded network of cells, the framework was developed and has been attributed with existing available georeferenced data including GL GIS data. Information about GLAHF, and the overall Great Lakes GIS initiative, can be found at: <http://ifrgis.snre.umich.edu/projects/GLAHF/qlahf.shtml>

Task 3: Identify metrics related to walleye habitat – The fishery quota for Lake Erie walleye is currently allocated based on a sharing formula (% surface area) that defines walleye habitat as nearshore water ($\leq 13\text{m}$ deep) in Michigan, Ohio and Ontario (Management Units 1-3; Figure 3). With the assistance of the Walleye Task Group and lead by researchers at the University of Windsor, we utilized a logistic regression approach to establish the relationships between a variety of abiotic conditions and the probability of occurrence of walleye (presence / absence) from a set of fishery and environmental variable linked datasets (Ontario Partnership Index Gillnet). Consistent with the literature, the probability of encountering walleye

increased in shallower, warmer and more turbid waters. In general, the west basin had more suitable habitat than the east basin. There was less habitat in epibenthic waters compared to subsurface waters in the east, but there was little difference in the west. This research was published in the *Journal of Great Lakes Research* (Pandit et al. 2013).



Figure 3. Present quota sharing allocation ($\leq 13\text{m}$; light blue) by jurisdiction (red).

Task 4: Strategic research direction for Lake Erie's Environmental Objectives (EOs) – The EO's for Lake Erie describe the ecological conditions necessary for realizing the lake's Fish Community Goals and Objectives (FCGOs). As part of a strategic approach to habitat management, the HTG is proposing to summarize the current state, trends, and potential threats for each of the Environmental Objectives in order to better understand the types of research questions and answers that will be required by the Lake Erie Committee to achieve the FCGOs. In 2012, members of the HTG used a stressor matrix to identify factors influencing the attainability of individual EO's. The results of this matrix suggest that many stressors can be addressed directly through current authorities and programs; however, most fisheries management agencies do not have regulatory authority over these stressors.

The HTG believes the EOs and FCGOs can be accomplished by providing science-based information and guidance as a key outreach strategy to those with regulatory authority. This will require identifying and filling current knowledge and data gaps, particularly nearshore habitat and fish community associations, and developing restoration techniques that can be applied in riverine, coastal, and nearshore environments. This will direct us towards designing an implementation strategy for in-water habitat enhancement. The development of guidance materials to be actively distributed with the EOs will be a necessary outcome of this approach. This will guide those with regulatory authority to incorporate beneficial design elements into habitat projects in the Lake Erie nearshore, tributaries, and other priority habitats.

The EO document can be found at: <http://www.glf.org/lakecom/lec/lehome.php>