HABITAT TASK GROUP
EXECUTIVE SUMMARY REPORT
MARCH 2016

Lake Erie Committee

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

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.

Five charges were addressed by the HTG during 2015-2016: (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; (4) Develop strategic research direction for Environmental Objectives; and (5) Develop Environmental Principles based on key functional habitats and priority management areas.

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.html Details of many notable projects can be found in the HTG Full Annual Report. In conjunction with Task 4 and 5, the HTG is identifying 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.

Assessing Walleye Spawning Habitat, Maumee River: The goal of this project is to determine if the availability and quality of spawning habitat could limit walleye production in the Maumee River. In spring of 2014 and 2015, egg sampling was completed in areas of favorable substrate and depth to assess the spatial and temporal trends in relative egg abundance. Side scan sonar imagery and field collection was also used to create substrate and bathymetry maps for the lower 56 kilometers of the Maumee River, from the mouth to the first dam. A high velocity section of the river, known as Jerome Rapids, was determined as a possible velocity barrier at river kilometer 30. Despite large areas of quality habitat identified above the rapids, there was low egg deposition at these upstream sites. As a result, it is determined that walleye spawning may be restricted to 3.34 million m^2 of accessible spawning habitat (gravel, cobble) below this restriction point. Using the carrying capacity estimates of 4,325 eggs/m^2 of cobble/gravel substrate, estimated stock size of ~126,000 mature females, and the average fecundity of 225,000 eggs, it is estimated that 6.55 million m^2 of preferred habitat is needed for the current population.

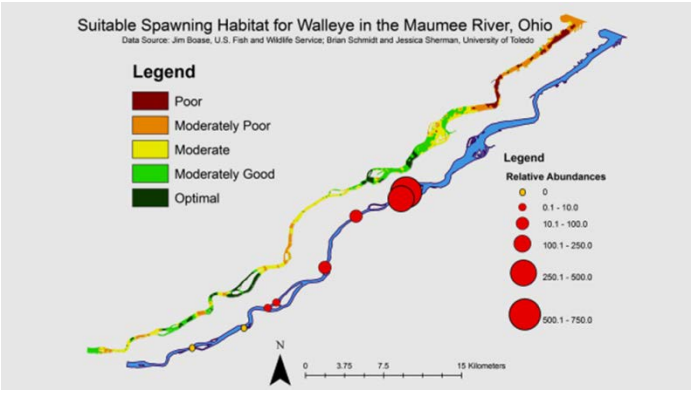

Figure 1. Map of suitable walleye spawning habitat in the lower 56 km of the Maumee River, compared to actual mean walleye egg deposition per sample in 2015.

Task 2: Use of Technology

Sidescan Sonar Comparison – 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 series of exercises comparing various types of sidescan systems and software to establish guidelines for collecting, processing, and analyzing sidescan data in Lake Erie.

Expanding on the comparisons completed in 2014, new comparisons have been completed in July, 2015 using a stand-alone L3-Klein unit and an integrated Humminbird system at 3 unique locations: Fairport Harbor breakwall, nearshore area adjacent to Painesville Township Park, and a deep water area north of Painesville Township Park. These sites represent varying depths and substrate types used for a broad spectrum of comparisons between the systems. The initial analysis suggests that at shallow depths and short ranges, the two systems collect comparable imagery. But in deeper water the Humminbird data is less detailed and has reduced

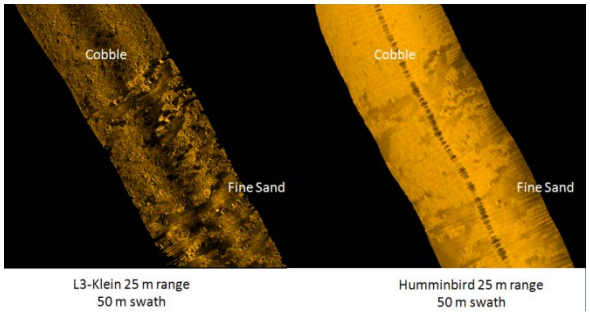

Figure 2. Comparison of sidescan sonar images. North of Painesville Township Park. Water depth: 25ft L-3 Klein: 500 kHz (left) Humminbird :455 kHz (right)

contrast compared to the high resolution of the L3-Klein(Figure2). Based on these results, fine-scale habitat mapping would be difficult using the Humminbird data in moderate to deep water while at longer ranges, the stand-alone Klein system is superior. In the upcoming year, the HTG intends to conduct similar comparisons using other systems (Edgetech, Marine Sonics, Lowrance) with varying habitats, ranges, and frequencies. Using the results and information form these comparisons will provide the HTG the opportunity to develop guidance documentation identifying recommended sidescan sonar systems and settings for particular data collection needs with plans to hold a workshop for those interested in the technology.

Great Lakes Aquatic Habitat Framework (GLAHF) – The GLAHF is a spatial framework and GIS database of geo-referenced data for Great Lakes (GL) coastal, large rivermouth, and open water habitats. The goal of the GLAHF is to provide access to a Great Lakes aquatic habitat database and classification framework to provide a consistent geographic framework to integrate and track data for habitat monitoring, assessment, indicator development, ecological forecasting, and restoration activities across the Great Lakes. The GLAHF framework and database have been substantively completed and the framework and spatial data are available at: glahf.org. Additional work to develop a web-based Decision Support Tool (DST) was undertaken in 2014. In July and October 2015, GLAHF staff with help from the HTG hosted workshops with biologists in the U.S. and Canada to identify what kinds of DSTs would help managers in their work and provide information at appropriate scales useful for decision making. GLAHF staff met again with the HTG in February 2016 to share the draft tool and get feedback before public release. The web tool will be available April 1, 2016 and accessible through glahf.org. A conceptual manuscript for the GLAHF published in the Journal of Great Lakes Research (Wang et al, 2015, JGLR 41(2) 584-596. The GLAHF team, in collaboration with US/Canadian hydrologist, has developed a set of harmonized watershed boundaries for the GL basin that incorporates the NHD+v2 and provides watershed boundaries at the same spatial scale across the basin. The watershed dataset is also available on glahf.org and a manuscript outlining the approach and methods has been accepted at Journal of the American Water Resources Association.

Task 3: Identify metrics of habitat use by fish – The fishery quota for Lake Erie walleye is currently allocated based on a sharing formula (% surface area) that defines walleye habitat as nearshore water (≤13m deep) in Michigan, Ohio and Ontario. Members of the HTG have attempted to use abiotic relationships to improve this definition of walleye habitat in the past (Pandit et al. 2013). Since 2010, an extensive acoustic telemetry tagging program has developed in Lake Erie as a part of the Great Lakes Acoustic Telemetry Observation System (GLATOS). GLATOS is providing an infrastructure for understanding the behavior, survival, and habitat use of Walleye in Lake Erie, without the biases associated with gill net survey gear. A manuscript quantifying the vertical habitat use of walleye from throughout the lake is currently in preparation.

Research on the effects of seasonal hypoxia in the central basin on fish distribution, particularly yellow perch, continues. Efforts to develop more data on dissolved oxygen effects on commercial trap nets will continue in 2016. NOAA-GLERL is leading a new effort to improve existing physical-biological coupled models to provide a nowcast or forecast of hypoxia in the central basin.

Task 4: Strategic research direction for Lake Erie's Environmental Objectives (EOs) – The HTG believes the LEC's EOs and Fish Community Goals and Objectives can be accomplished by providing science-based information and guidance as a key outreach strategy to those with regulatory authority. This will require identifying current knowledge and data gaps and developing restoration techniques that can be applied in riverine, coastal, and nearshore environments.

Task 5: Develop/ maintain a list of key functional habitats (FH) and priority management areas (PMA) that would support LaMP and LEC EOs - The HTG is identifying Functional Habitats and Priority Management Areas following the guidance of the Council of Lake Committee "Environmental Principles for Sustainable Fisheries". A key concept in this approach is that a diversity of functional habitats is needed to sustain fish production using three types of management actions: Protection, Restoration, and Enhancement. These principles need to be used by managers to set priorities for implementation of these actions. This information, along with information from Task 4, will be incorporated to create guidance materials to be distributed for identification of PMAs and habitat management strategies to accomplish the Fish Community Goals and Objectives.
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.glfc.org/lakecom/lec/lechome.php