HABITAT TASK GROUP
EXECUTIVE SUMMARY REPORT
MARCH 2017

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://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 2016-2017: (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: http://glfc.org/lakecom/lec/spatial_inventory/inventory_index.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.

Strawberry Island Habitat Improvement Project-
The final phases of the Strawberry Island Habitat Improvement Project were completed by the NY Power Authority in collaboration with NYS DEC, USFWS, Tribal Nations, and local organizations in partial fulfillment of their Re-licensing agreement for the Niagara Power Project. The scope of this project is to build on past work to restore emergent wetland habitat in the shallow water areas around the perimeter of the island as well as inside the "lagoon." By amending the substrate with coarse sediment and constructing rock berms and anchoring large wood the goal is to mitigate wave and ice scour in this high energy, mid-river environment. This will promote growing conditions in which emergent wetland vegetation can be established successfully as well as creating complexity and diversity in the plant community with variable water depth and physical structure. The newly established wetlands will support the native fish community by creating foraging, spawning, and nursery habitat in locations that have experienced habitat degradation due to past and current practices related to mining, commercial shipping and recreational boating. The earth work was completed in early 2016 with the wetland plantings installed later in the summer. These projects have restored approximately 18 acres of mid river and coastal habitat, and have made direct progress towards the LEEO #2, #6, #8, and #9 (Table 1-1), and FCO C (Table 1-2) by improving coastal shoreline processes to promote naturally occurring vegetation, halting and reversing habitat loss, and providing access to spawning and nursery habitat for native fish species.

Figure 2 View of Strawberry Island looking downstream toward Frog and Motor Islands. Photo: Paul Leuchner

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.

The Ohio DNR and PA Coastal Resources Management Programs acquired additional nearshore sidescan sonar data east of Conneaut Harbor (Figure 3b-3). The objective of the survey was to map the lakebed substrate distribution and assess the effectiveness of historic beach nourishment (sand bypassing) performed by the USACE and the Port of Conneaut at the request of the State of Pennsylvania. The intent of the sand bypassing operations was to create and maintain beaches in the nearshore to protect rapidly eroding Pennsylvania game lands further to the east. The sidescan data revealed that bypassed sand is shunted offshore by bedrock ridges and accumulates in low-lying troughs oriented parallel to shore.

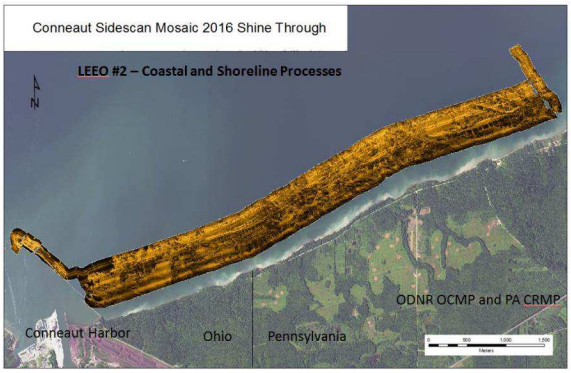

Figure 3b-3. Sidescan mosaic showing sidescan sonar data coverage east of Conneaut Harbor, OH. Light colored areas are mobile sandy sediments and dark areas are exposed flat-lying fractured bedrock.

Great Lakes Aquatic Habitat Framework (GLAHF) – Access to spatially-explicit databases, maps and decision support tools are improving knowledge of interactions between fish populations and environmental variables on lake-wide and relevant spatio-temporal time scales. The Lake Erie Geographic Information system (GIS), a 2-dimensional database of open water habitats and fisheries data, has been incorporated into the Great Lakes Aquatic Habitat Framework (GLAHF), which can be used to identify and examine aquatic ecological units (Figure 3c-1). The GLAHF is an online GIS framework and database of geo-referenced 3-dimensional data (including at depth) for Great Lakes coastal, large rivermouth, and open water habitats (www.glahf.org). GLAHF provides access to a consistent geographic classification framework to integrate and track data from habitat monitoring, assessment, indicator development, ecological forecasting, and restoration activities across the Great Lakes. GLAHF includes a web decision support tool for data download, data visualization, and habitat criteria for Lake Erie (glahf.org/explorer). The data contained in GLAHF include geo-processed biological data, especially fish community data, and data collected in recent surveys of nearshore areas (Environment Canada, U.S. Environmental Protection Agency, U.S.Geological Survey, state and provincial natural resource agencies,).

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 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://glfc.org/lakecom/lec/lechome.php