HABITAT TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2010

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 2009-2010: (1) Document habitat related projects. Identify and prioritize relevant projects to take advantage of funding opportunities; (2) Support Lake Erie GIS development and deployment.; (3) Assist the Coldwater Task Group with the lake trout habitat assessment initiative; (4) With the assistance of the Walleye Task Group, identify metrics related to walleye habitat for the purpose of re-examining the extent of suitable adult walleye habitat in Lake Erie and (5) Develop strategic research direction for Environmental Objectives.

Habitat Project Documentation

Information pertaining to habitat related initiatives taking place throughout the Lake Erie and Lake St. Clair basins is compiled made available as an interactive "clickable map" which allows for spatial sorting of projects (by watershed or lake basin). This information is available at:

http://www.glfc.org/lakecom/lec/spatial_inventory/inventory_index.htm
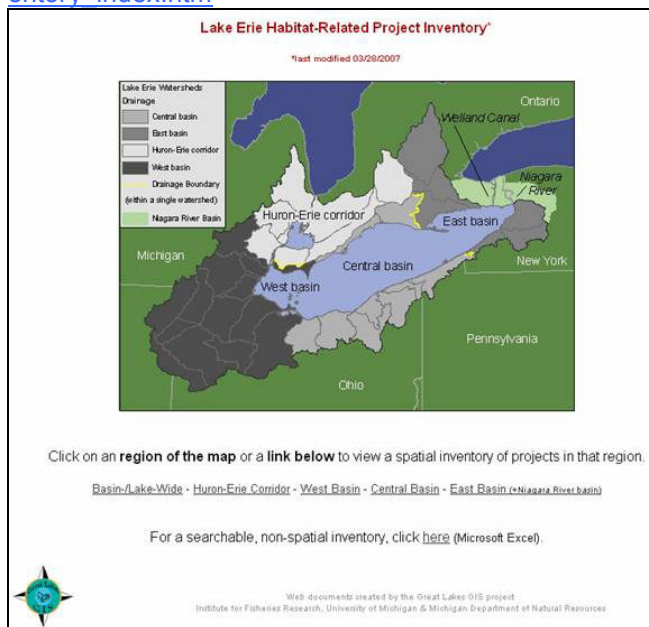
Main web-page of Habitat Project Spatial Inventory

Next steps for this charge include integration of project information into a query-able database. Some notable current and ongoing projects are detailed within the complete HTG annual report. These projects include:

- Nearshore Aquatic Habitat Classification – GL Aquatic GAP Analysis
- Fish Habitat Assessment and Rehabilitation in the Huron Erie Corridor
- Nearshore Fish Community in the western basin (OH)
- Ballville Dam Removal Project (OH)
- Central Basin Hypoxia and Yellow Perch Research
- Grand River (ON) Habitat Rehabilitation

Lake Erie GIS

The Great Lakes GIS, including the Lake Erie GIS, was created in order to facilitate the sharing of data and holistic management of the Great Lakes basin as described in the Joint Strategic Plan for Management of Great Lakes Fisheries. The project includes map-delineated spatial units and associated habitat and biological attribute data for terrestrial, tributary rivers, nearshore, and offshore ecosystems.

Two LEGIS projects were completed in 2009 / 2010:
1. An effort to acquire and map data on habitat and habitat suitability of non-game species within Michigan's waters (MDNRE)
2. Development of a decision support project tool to aid in visualizing the impacts of lakebed alteration on fish habitat in Michigan waters (MDEQ)

The HTG encourages all interested individuals and groups to visit the GLGIS website (http://www.glfc.org/glgis) and consider how you might be able to use or contribute to this exercise.

Identifying Potential Lake Trout Spawning Habitat

As part of its commitment to work with the Cold Water Task group, the HTG continues to make progress toward identifying potential lake trout spawning habitat within Lake Erie. In 2009, considerable progress was made characterizing substrate and bottom type with sidescan sonar and RoxAnn surveys of:

- The Pennsylvania Ridge
- Clear Creek Ridge
- Long Point Ridge
- Hoover Point (expanded eastern coverage) Tecumseh Reef (expanded coverage)
- Brocton Shoal (expanded coverage)

To date, more than 128 km^2 of lakebed has been surveyed with sidescan sonar as well as 121 km^2 using RoxAnn classification. This includes areas on the north and south shores of the eastern basin and

on the ridge complex that delineates the east from the central basin of the lake (Figure 2)
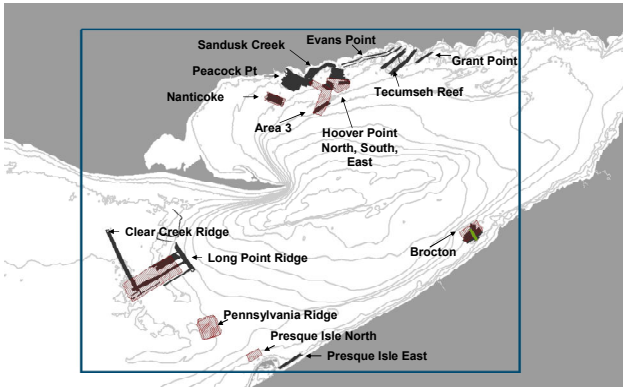

Figure 2. Areas of the east and east-central basin of Lake Erie surveyed between 2006 and 2009. Solid areas represent coverage by Sidescan sonar; Pink, hatched areas represent coverage by RoxAnn bottom typing.

Ongoing interpretation and mapping work clearly demonstrate the inadequacy of current substrate maps and bathymetric data. This interpretive exercise continues to inform the development of habitat classification within L. Erie. Two separate geodatabases have been created from the sidescan sonar data: 1) traditional substrate maps that classify bottom texture and composition (e.g. bedrock, boulder, cobble, gravel, sand, silt, clay, and cohesive clay), and 2) habitat structure that includes bedrock scarps, ledges, scarp debris, rock piles or linear ridges, woody debris. In 2009, a classification scheme was developed to guide and catalogue the subjective interpretation of underwater video. Examination of video from 160 sites (J. Morse) has provided a context for the extent of coverage by lithophillic species such as dreissenid mussels and attached filamentous algae, two examples factors that may preclude successful lake trout spawning despite suitable physical features.
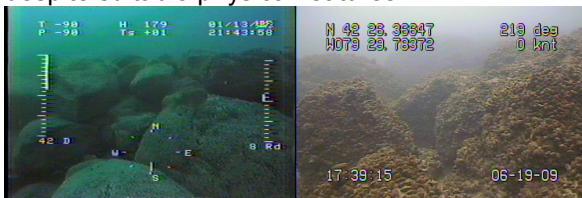

Figure 3. Degree of cover by dreissenid mussels at historic LT spawning area (Brocton Shoal). Left image is from 1987 (Edsal) and right image is current (2009).

Identified areas of suitable substrate are currently being used to direct stocking and assessment of mature lake trout and evidence of reproduction (egg traps). A new examination of habitat associated with known spawn-ready lake trout in the nearshore waters of Pennsylvania has given rise to a reconsideration of the traditional definition of suitable lake trout spawning habitat.

Identify metrics related to walleye habitat
Fishery quota for walleye in Lake Erie is currently allocated based on a sharing formula (% surface area) that defines walleye habitat as nearshore water (<13m deep) in Michigan, Ohio and Ontario

(Management Units 1-3). With the assistance of the walleye task group, the HTG will define a set of habitat metrics and use them to create estimates of preferred adult walleye habitat. In 2009, a series of habitat variables were chosen that were not only deemed appropriate for walleye but also for which datasets currently exist and provide lakewide coverage. These include: temperature, dissolved oxygen and light attenuation (Secchi depth). Utilizing a set of fishery and environmental variable linked datasets (Ontario Partnership Index Gillnet), a logistic regression approach was devised (Pandit et al.) to establish the relationships between a variety of abiotic conditions and the probability of occurrence of walleye (presence / absence). Once the logistic regression is fully developed the next
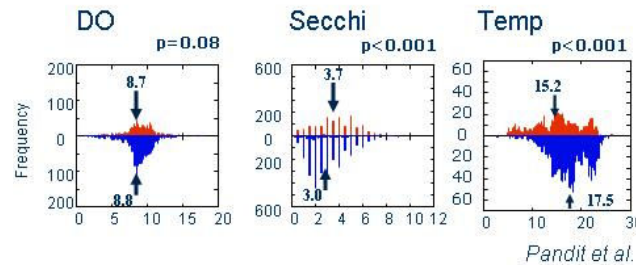

Figure 4. The frequency of OMNR gill nets (1990-2008) with walleye absent (red) and present (blue) with respect to dissolved oxygen, secchi and temperature at the net depth.

step will be to generate a series of habitat suitability maps based on existing large and spatially broad datasets. Because temperature, d.o., and secchi are extremely dynamic, we will examine the seasonal variability in this model by using a monthly gill net data series from ODNR (1990-1992) and assess inter-annual differences using OMNR and ODNR gill net data from fall surveys (2004-2008). The impact of population density, population structure (i.e. age and gender), and forage distribution on the spatial distribution of walleye will also be considered. The final deliverable for this charge will be one lakewide map of suitable walleye habitat at a 50 m resolution. We will include summaries from these various scenarios to understand how the amount of habitat can change by jurisdiction based on changes in these parameters.

Strategic research direction for Lake Erie's Environmental Objectives (EOs)
The Environmental Objectives (EO's) for L. Erie describe the ecological conditions necessary for realizing the lake's Fish Community Goals and Objectives (FCGOs, Ryan et al. 2003). The HTG continues to work toward: 1) defining specific research needs which bring focus to the broad descriptions of objectives as laid out in the document; 2) make the document more widely known and encourage its integration into research planning within LE and 3) Use the EOs to develop cooperative planning between LE task groups
The EO document can be found at:

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