FISHERY RESEARCH PRIORITIES:

LAKE ONTARIO
Great Lakes Fishery Commission

November 18, 2015

The Lake Ontario ecosystem is extremely dynamic, and has experienced rapid and significant change in the last decade. The following research priorities were developed by the Lake Ontario Technical Committee, and are based on information required to assist in achieving and or evaluating the "Fish Community Objectives for Lake Ontario, 2013" (Stewart et al. 2014, http://www.glfc.org/lakecom/loc/LO-FCO-2013-Final.pdf).

The order of listing of the research priorities does not imply relative ranking of priorities for the Fishery Research Program funding.

GLFC Research theme area:

Re-establishment of Native Deepwater Fishes

- Are there differences in thiamine levels between Lake Trout strains? Does one strain incorporate gobies in their diet more than others (e.g. could be determined by investigating variation in isotopic signature among strains)?
- Identify and assess Lake Trout spawning habitat and early life history processes
- Develop effective marking techniques for stocked coregonids for assessing stocking success (life stage, location, timing etc.).
- What is the status of historical lake trout spawning grounds, and what are the limiting factors impacting wild reproduction (cladophora, goby, dreissenids)?

Physical Processes and Fish Recruitment in Large Lakes

- Characterize Lake Herring spawning habitat, investigate early life history processes and identify bottlenecks to restoration of this species in the Bay of Quinte, Hamilton Harbour, Chaumont Bay and/or Irondequoit Bay.

Energy Dynamics of Great Lakes Food Webs

- Conduct lower trophic level modeling to synthesize data and identify key variables (e.g., primary production, Mysis, Dreissenids).
- What are the important linkages/drivers between lower trophic levels and the fish community and how do they operate? Can improved understanding of these linkages

facilitate risk-management and allow managers to predict changes in the fish community (e.g. alewife biomass)?

Non-theme Research

- Identify the most important contributing factors to apparent smallmouth bass recruitment impairment in Lake Ontario and the St. Lawrence River(e.g. fecundity, spawning habitat, egg/fry predation, prey availability for YOY, angler impacts, VHSv, Cladophora, etc.)?
- What factors are contributing to declining yellow perch populations?
- What determines the survival of Atlantic Salmon in the open lake environment?
- What are novel approaches to mitigating the impacts of mortality of American Eel in hydroelectric generation turbines during their downstream migration?
- Based on new insights into Chinook salmon survival/natural reproduction and lakewide alewife abundance, develop new models to predict overall trout and salmon abundance and predator:prey balance.
- Are there differences in the thiamine levels present in stocked vs. wild salmon and trout found in Lake Ontario? For wild and stocked Chinook at the same thiamine levels, do untreated embryos experience similar survival?
- There have been dramatic declines in benthic fish abundance and distribution in the Eastern Outlet Basin over the past two decades. What factors have contributed to this?