Great Lakes Fishery Commission

ESTABLISHED BY CONVENTION BETWEEN CANADA AND THE UNITED STATES TO IMPROVE AND PERPETUATE FISHERY RESOURCES

Lake Michigan Technical Committee
Annual Report to the Lake Michigan Committee
For the Period March 2009 – March 2010

Meetings

The Lake Michigan Technical Committee (LMTC) met two times since March of 2009. A summer meeting was held in Peshtigo, WI in July 2009 and a winter meeting was held in Chesterton, IN in January 2010. Minutes were taken and distributed for both meetings.

Integrated management of sea lampreys in Lake Michigan

The Great Lakes Fishery Commission and the U.S. Fish and Wildlife Service continued to implement Integrated Management of Sea Lampreys (IMSL) in Lake Michigan. During 2009, sea lamprey numbers were within the Fish Community Objective target for Lake Michigan for the first time since the 1999 spawning year. Spawning-phase sea lamprey abundance was estimated to be 59,800 (56,131 – 64,700, 95% confidence interval), a decrease of 42% from 2008. Spawning-phase sea lamprey abundance was less than or within the target range prior to the 2000 spawning year, greater than targets from the 2000 - 2008 spawning year and within the target range in 2009 (Figure 1).

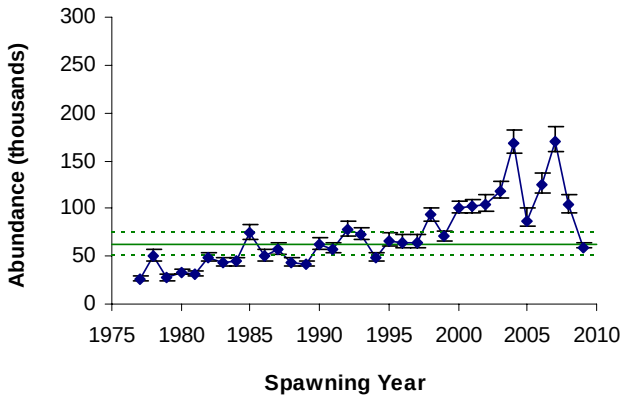


Figure 1. Abundance estimates with 95% CIs of spawning-phase sea lampreys. Target abundance and 95% CI range were estimated from abundances during a period with acceptable marking rates (horizontal solid and dashed lines).

Twenty five streams and two lentic areas were treated in 2009 and assessments of sea lamprey larvae were conducted to search for new or monitor existing populations in 97 tributaries and offshore of 13 tributaries. Beginning in 2001, the amount of treatment effort increased with special emphasis on increasing suppression in Lake Michigan. Significantly more annual control effort was directed to Lake Michigan during 2001 – 2009 than during the previous six years. The Manistique River was treated in 2003, 2004, 2007, and again in 2009. "Geographic efficiency" was applied to expand the number of streams treated, that is, control crews added small streams that would not have ranked for treatment, but could be treated during field trips because they were located near other scheduled streams. Beginning in 2005, the states and tribes of Michigan and Wisconsin agreed to increased TFM concentrations in select sturgeon streams to maximize treatment effectiveness. Treatments of streams with sturgeon reproduction are still scheduled later during the year, when young sturgeons are less vulnerable. The control agents implemented options to improve treatment effectiveness on some streams during 2006 to 2009, including applying longer lampricide blocks, using higher concentrations, increasing secondary applications of lampricides to backwaters and small tributaries and scheduling of streams to increase the likelihood of favorable flow conditions.

An intensive effort to inventory and ground truth the information contained in the National Inventory of Dams (NID) was undertaken for barriers located on tributaries to the Great Lakes. During 2007-2009, over 2,500 barriers were inventoried throughout the Great Lakes basin, including 752 tributaries to Lake Michigan. This completes the first stage of ground truthing the current barrier database and will provide important information regarding the current condition of barriers and their ability to block spawning-phase sea lampreys.

The Service continues to work with federal and state regulatory agencies to implement an integrated control program that is ecologically and economically sound and socially acceptable. In 2009, a Biological Assessment was drafted to assess the potential effects of the proposed lampricide application in the Carp Lake River on the federally endangered Hungerford's Crawling Water Beetle (HCWB). Following review, the Service responded with a Biological Opinion concluding that the treatment was not likely to jeopardize the continued existence of the HCWB. As a result, the Carp Lake River was successfully treated in May 2009.

Working with the GLFC and fishery managers, the Service and Department of Fisheries and Oceans, Canada drafted a plan to manage sea lampreys in the Great Lakes with specific chapters for Lakes Superior and Erie. Using these chapters as a template, the Lake Michigan chapter is currently being drafted. Following GLFC approval, the plan will be designed to coordinate and implement sea lamprey management and assist in program decision making and communication among sea lamprey control agents, fish managers, Commissioners and stakeholders. The plan will follow and support the GLFC's Vision and Fish Community Objectives, and will include various sections that describe the history and background of sea lamprey management, sources of sea lamprey production and objectives and strategies that will be implemented to move towards target levels of sea lamprey abundance.

Yellow Perch Task Group

All agencies participated in spring assessments to monitor adult yellow perch populations using standard graded mesh gill nets. Strong recruitment of the 2005 year class was apparent in data collected in most assessments; yellow perch from the 2005 year class made up approximately 25-60% of the adult population in the various state waters. Continued survival of the 1998 year class (age 11) is also apparent in data collected in Illinois (>5% of the adult population) and Wisconsin (>10% of the adult population) waters of Lake Michigan. Data from common mesh sizes fished in all jurisdictions show that current adult yellow perch abundance remains well below the

historically observed abundance of the late 1980s and early 1990s. While catch of age-0 yellow perch in 2008 was slightly greater than that observed in 2007 in some areas of southern Lake Michigan, recruitment in general was relatively low (weak) in most areas of the lake, in comparison to long-term averages.

A brief winter 2010 meeting of the YPTG was held on January 27, 2010, following the winter Lake Michigan Technical Committee meeting in Chesterton, Indiana. Agenda items at this meeting included review of 2009 perch assessments, plans for the annual report, lakewide young-of-year gill net assessments, and discussion of a possible update to the Decision Analysis model.

No significant changes occurred during 2009 with regards to regulations for sport or commercial harvest of yellow perch. No changes are anticipated for 2010.

Planktivore Working Group

USGS and MDMR staff provided preyfish reports and presentations in March of 2009 including results of Lake Michigan bottom trawl and acoustic surveys conducted in 2008. USGS staff also provided a report on cross-basin status and trends of prey fish in 2008. Lake Michigan survey results were also provided to the Salmonid Working Group for inclusion in the Red Flags Report. These working group members also conducted lakewide bottom trawl and acoustic surveys in 2009 as well as a bottom trawl survey of Green Bay. Results of the 2009 surveys will be presented in March 2010 and are summarized below.

Based on results of the 2009 cooperative (U.S.G.S Great Lakes Science Center and Michigan Department of Natural Resources and Environment) Lake Michigan acoustic survey (22 transects, 27 midwater tows, 14 mysid tows), lake-wide biomass of alewives was 99.2 kilotonnes (kt) (1 kt = 1000 metric tons), which was 1.7 times the 2008 estimate. Lakewide biomass of bloater in 2009 was 9.4 kt, which was 33% lower than the 2008 estimate. Lakewide biomass of rainbow smelt decreased 41% from 2008 to the 2009 value of 5.1 kt. Mean total prey fish biomass was ≈114 kt, which was 1.4 times higher than the estimate for 2008 and 1.2 times the long-term mean. The increase from 2008 was because of increased biomass of age-2 and older alewife, of which the 2005 year-class showed the largest increase. The 2009 alewife year-class contributed ≈2% of total alewife, while the 2005 alewife year-classes contributed ≈34%. Alewife comprised 87% of total prey fish biomass, while rainbow smelt and bloater were 8 and 5% of total biomass, respectively. Bloater biomass remains much lower than in the 1990s, but mean density of small bloater in 2009 (574 fish/ha) was the highest observed in any acoustic survey on record. Additionally, this was the third consecutive year of increased small bloater density. Mean density of *Mysis diluviana* has remained relatively constant over time with an observed range from 185 ind./m^2 in 2005 to 112 ind./m^2 in 2007, and no significant difference in mean density among years. In 2009, mean density of *Mysis diluviana* was 117 ind./m^2.

Based on the U. S. Geological Survey Great Lakes Science Center lake-wide bottom trawl survey, lake-wide biomass of alewives in 2009 was estimated at 13.03 kilotonnes (kt) (1 kt = 1000 metric tons), which was more than double the 2008 estimate. Lake-wide biomass of bloater in 2009 was estimated at 6.98 kt, which was nearly three times higher than the 2008 estimate. Rainbow smelt lake-wide biomass equaled 1.26 kt in 2009, which was nearly double the 2008 estimate. Deepwater sculpin lake-wide biomass equaled 3.73 kt, which was only 4% lower than the 2008 estimate. Nevertheless, the 2009 estimate was the lowest value in the deepwater sculpin time series. Slimy sculpin lake-wide biomass remained relatively high in 2009 (3.59 kt), increasing 72% over the 2008 level. Ninespine stickleback lake-wide biomass equaled 0.39 kt in 2008, which was nearly identical to the 2008 estimate. The final prey fish, exotic round goby, decreased by 83% between 2008 and 2009, from 3.76 to 0.63 kt. Burbot lake-wide biomass (0.90 kt in 2009) has remained fairly constant since 2002. Numeric density of age-0 yellow perch (i.e., < 100 mm) equaled 38 fish per ha, which is indicative of a relatively strong year-class. Lake-wide biomass estimates of dreissenid mussels increased by more than fivefold from 7.57 kt in 2008 to 40.79 kt in 2009. Overall, the total lake-wide prey fish biomass estimate (sum of alewife, bloater, rainbow smelt, deepwater sculpin, slimy sculpin, round goby, and ninespine stickleback) in 2009 was 29.62 kt, which represented a 52% increase over the 2008 estimate.

Green Bay Forage Trawling

In 2009, two transects, Sturgeon Bay to Marinette (north) and Riley's Point to Peshtigo Reef (south), were sampled starting at 50 feet and continued across central Green Bay in ten foot increments. With all drags on the north transect combined by weight, round goby, lake whitefish and dreissenid mussels accounted for 91.5% of the biomass captured. Similar to the north transect, dreissenid mussel, lake whitefish and round goby dominated the catch along the south transect and accounted for 70.8% of the total catch by weight. Alewife was also commonly caught along this transect.

Total catch and CPE in 2009 decreased 9% from 2008 levels and was our lowest catch of the time series. Since 2005 our catch of adult lake whitefish and white sucker has dropped substantially and likely accounts for the declining overall CPE noted since 2005. It is not clear why, although we suspect warmer water temperatures and perhaps low dissolved oxygen levels near the bottom may account for the differences that we noted in 2008 and 2009 as compared to 2004 and 2005. Although adult lake whitefish CPE has declined, the catch trend for young of year and age 1+ lake whitefish has been increasing throughout this survey.

We have also noted declines in CPE for alewife, rainbow smelt, burbot and yellow perch during this survey. The rainbow smelt population trend remains unclear. Total rainbow smelt CPE and young of year abundance decreased in 2009 after an increase in 2008 following several years of poor catches.

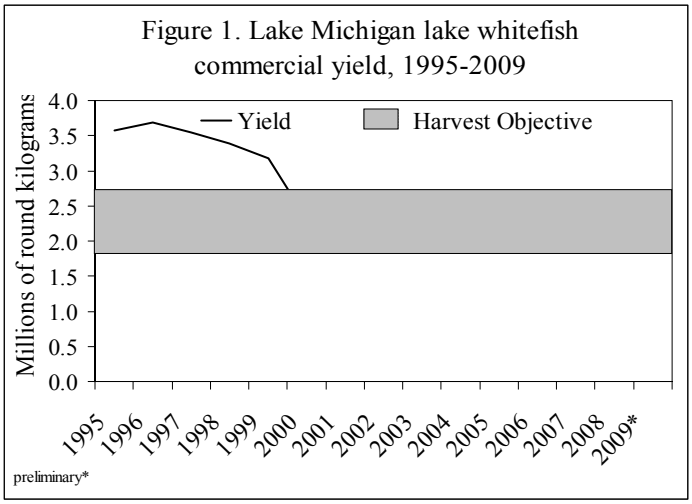
CPE has been increasing for round goby since 2003 which indicates that they have become well established in Green Bay. After declining in CPE from 2003 through 2006, dreissenid mussels have been increasing in CPE since 2007. In 2009 dreissenid mussels and round goby were captured in nearly every tow and accounted for 32.8% and 22.3% of our total catch by weight respectively. Both are slightly more abundant along the north transect than on the south transect.

Benthivore Working Group

The primary function of the Benthivore Working Group (BWG) is to compile and disseminate biological information on key benthivore species to the member agencies of the LMTC and to the Lake Michigan Committee (LMC). Since there is some overlap between the BWG and the work being conducted by Lake Sturgeon Task Group, this section will focus on 1) evaluating the lake whitefish harvest objective of the Benthivore Fish Community Objective and 2) communicating the priority research needs for this fish community as determined by working group members.

Lake Whitefish Harvest Objective

During 1995-2009, the average yield of whitefish from Lake Michigan was approximately 2.6 million kilograms, near the upper range of the target established in the Fish Community Objective (Figure 1). In 2000 yield declined from the 1995-1999 average of 3.5 million



kilograms to 2.3 million kilograms. Yield has remained fairly stable since then and within the harvest objective of 1.8 to 2.7 million kilograms. The commercial yield of lake whitefish from Lake Michigan was 2.44 million kilograms in 2009, the highest since 2000.

Estimates from modeling efforts in the treaty waters of Lake Michigan suggest that most northern stocks experienced strong recruitment over the past decade. The combination of declining fishing mortality and solid recruitment contributed to increased estimates of standing stock biomass throughout most of the 2000s. Although growth may have stabilized from the long-term decline which began in the early 1990s, the potential impacts of lower trophic-level disturbance on growth and recruitment remain a concern. In many areas, whitefish do not recruit to fishing gear until age six or seven, so future efforts by management agencies should focus on developing better indices of recruitment.

Priority Research Needs

In August 2009, BWG members updated and prioritized its list of research needs. The ranking process was undertaken, in part, to facilitate the broader prioritization efforts undertaken by the LMTC. The BWG considered sixteen research questions during the review process. In the interest of brevity, the top six are listed below.

What are the stock/region-specific implications (eg growth, recruitment, fecundity) of changes in whitefish condition and/or energetic status in Lake Michigan?
What are the population specific factors limiting survival, recruitment and population growth in each remnant and recently stocked lake sturgeon population in the Lake Michigan basin, and what are current demographics and trajectories of existing populations?

What need is there for sturgeon passage in various Lake Michigan tributaries (both upstream and downstream) and what technology's can be successfully employed to meet these needs?

Are there survey techniques available for developing a cost-effective pre-recruit index for lake whitefish that would have implications for stock assessments and estimates of allowable catch?

What are the most important specific factors influencing lake whitefish recruitment and how might such information be used to better define the stock-recruit relationship in population models?

What is the magnitude of prey consumption by burbot in Lake Michigan? Is the burbot population in offshore waters capable of exerting predatory control on round gobies?

Lake Sturgeon Task Group

Members of the Task Group continue to implement and evaluate the use of streamside rearing facilities to rehabilitate and reintroduce lake sturgeon populations into Lake Michigan rivers (Table 1). The LRBOI completed a 6th year of rearing wild collected Manistee River larvae in their streamside facility and releasing them back to the river each fall. Fairly consistent numbers have been released each year and preliminary evaluations indicate this effort is approximately doubling the current annual wild production in this system. The Wisconsin DNR facilities were operated on the Milwaukee River for the fourth consecutive year and on the Kewaunee River for the first year (the previously sited Manitowoc River was permanently relocated to the Kewaunee River in 2009). Over 2000 fingerlings were successfully reared and stocked from each facility during July-September in 2009. This was the first year the target annual stocking goal of 1500 fall fingerlings per river was met. Gametes for these two reintroduction efforts continue to come from Wolf River donors. The Michigan DNRE facilities operated successfully for a 2nd year on the Cedar and Whitefish Rivers. For the first time, gametes were collected and reared from a full complement of families originating from four female and 18 male donors. Success in previous years had been hampered by difficulty collecting eggs from multiple females from the Menominee River so gamete collections were shifted to the Peshtigo River in 2009 where donor fish were more accessible. It is anticipated that stocking will reach target goals in these two rivers in future years.

Table 1. Number of rearing assistedP[1P] and newly reintroducedP[2P] fingerling lake sturgeon stocked into Lake Michigan rivers from streamside rearing facilities.

River Year	ManisteeP[1P]	MilwaukeeP[2P]	KewauneeP[2P] (Manitowoc*)	CedarP[2P]	Whitefis
2009	34	2038	2388	75	198
2008	47	767			
2007	29	158	67*	189	772
2006	89	27			25
2005	51				

A final draft of the *Stocking Guidelines for the Genetic Management of Lake Sturgeon in the Great Lakes Basin* (Welsh et al.) was distributed to the management agencies in 2009 and was submitted to the GLFC for publication. This followed extensive revisions based on review and comment by resource agencies and institutions during 2008 and editorial review by the GLFC during 2009. Nine co-authors including representatives from MDNRE, WDNR, LRBOI and USFWS have been very involved in completion of this document which provides an important cornerstone for completion of a Lake Michigan Lake Sturgeon Rehabilitation Guide. A redraft of the Lake Michigan Rehabilitation Guide was recently distributed to the Task Group Steering Committee by the Task Group Chair. Following further review, this new draft will be finalized and distributed for review by the entire Task Group and the LMTC. This will continue to be a focus of the Task Group Chair during 2010. Priority Research Needs for lake sturgeon for the LMTC were developed and prioritized by the Benthivore Work Group and are included in the BWG section of this report.

In 2009, several research and status assessments continued on important remnant Lake Michigan populations. Projects focusing on the early life history dynamics and natural recruitment in the Peshtigo River population were completed, population status assessments focusing on spawning abundance, reproductive success and habitat use continued on the Muskegon, Grand, and Kalamazoo Rivers, stock assessment continued on the Menominee River, studies of the

movement and distribution of lake sturgeon in several regions of Lake Michigan using telemetry are ongoing, and stock discrimination and mixed stock analysis using genetics continued for open water samples collected from throughout the basin. Initiatives also continue in several rivers to improve habitat, remove barriers, improve flow regimes, reduce entrainment, and plan for installation of effective fish passage for sturgeon.

Research Priorities

The Lake Michigan Technical Committee decided on these top three research priorities in 2009:

1) What are the current species-specific abundances, production, and forage demand of the Lake Michigan salmonine community? And what levels of salmonine production and yield are sustainable without threatening the biological integrity of the Lake Michigan fish community – including consideration for other Fish Community Objectives?
2) To what extent does thiamine deficiency complex (TDC) impede lake trout rehabilitation in Lake Michigan?
3) What contributions do naturalized fish make to the lakewide salmonine abundances, production, forage demand, and annual yield? Is there an interaction between salmonine stocking rates and naturalized salmonine production?

The group also decided that the entire list of 15 research items identified by the LMTC should be included in the document sent to the GLFC and posted on the website at:
http://www.glfc.org/research/FisheryDesc.phpT

Submitted:
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March 23, 2010