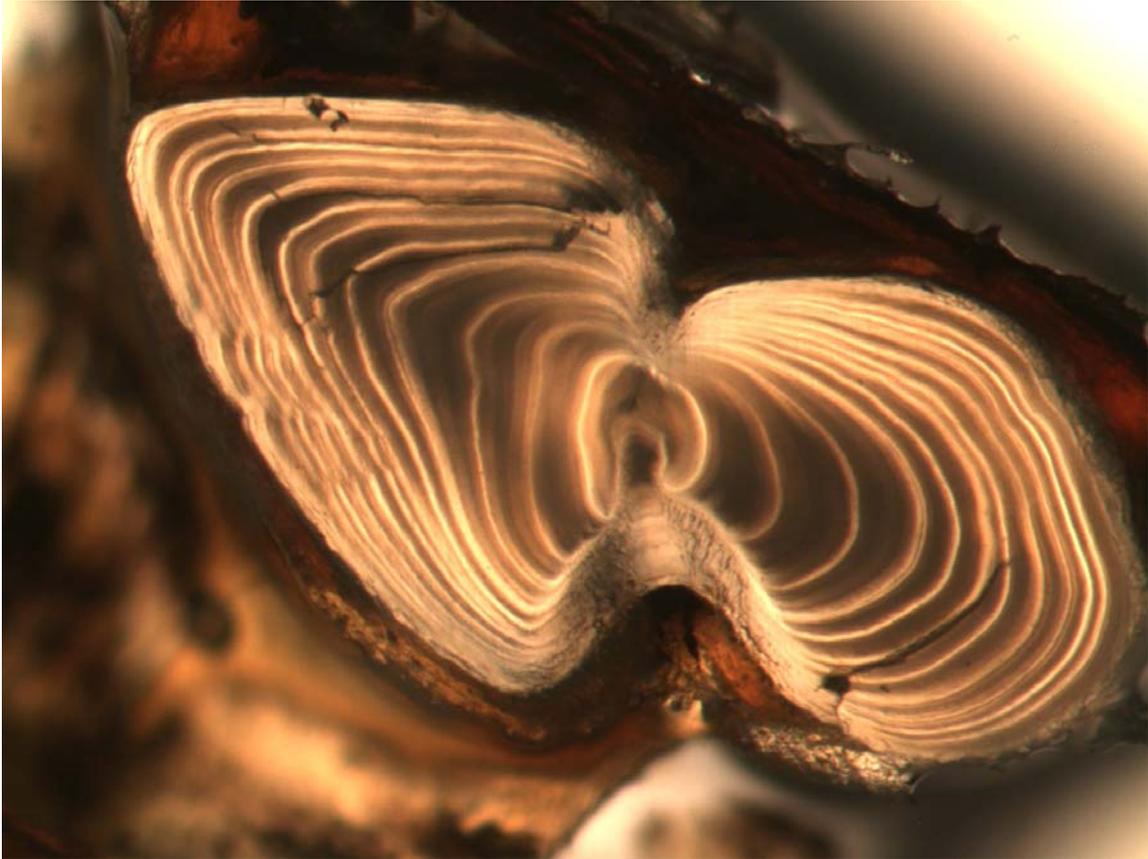


Status of Yellow Perch in Lake Michigan and Yellow Perch Task Group Progress Report



REPORT TO THE LAKE MICHIGAN COMMITTEE
Windsor, Ontario
March 23, 2006

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Yellow Perch Task Group Contact List: 2005-2006

This report was prepared from information provided by the following Lake Michigan Yellow Perch Task Group members and contributors. Questions regarding data from a specific area of Lake Michigan, or concerning a specific aspect of Lake Michigan yellow perch research, should be directed to the contributor of that information (see Appendix 1 for a map of lake areas).

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Status of Yellow Perch in Lake Michigan

Yellow perch assessment activity is occurring throughout the lake, with numerous agency and university personnel sampling perch utilizing various gear types in different seasons. Selected parts of this information are presented here, in three sections. The first section covers the relative abundance of adult (age 1 and older) yellow perch. The second section examines the most recent age structure data available for different parts of the lake. The final section consists of estimates (or indices) of juvenile yellow perch recruitment: most of this data comes from collections of age-0 yellow perch. Coordinated regulation of yellow perch harvest has been an important part of perch management in recent years. Current commercial and recreational regulations for all Lake Michigan jurisdictions are included as a final section of this status report.

Adult Relative Abundance

The data assembled was collected with either gill nets or bottom trawls (Figures 1 to 6). Generally, this information shows a long-term decline in adult yellow perch abundance. The longer data series show a peak abundance in the mid- 1980s to early 1990s, followed by significant declines through the early 2000s (Figures 2-5). Increases in catch-per-unit-effort resulting from recruitment of the 1998 and 2002 year classes are apparent in some data series (Figures 1-5), and there is some indication of population recovery in the southern basin (ex., Figure 2). Data from common gear types (graded mesh gill net) fished in all jurisdictions are presented in Figure 6; these index data show that current abundance remains well below the historically observed abundance of the late 1980s and early 1990s.

Since the mid 1990s, there has been a general upward trend in the frequency of females within the adult assessments (Figures 1-4). Percent females in Indiana and Michigan waters of Lake Michigan have fluctuated around 50-60% for the past four years (Figures 1-2). The percentage of females in Illinois and Wisconsin waters has been more variable, ranging from 20-80% (Illinois) and 35-65% (Wisconsin) during the same time period (Figures 3-4).

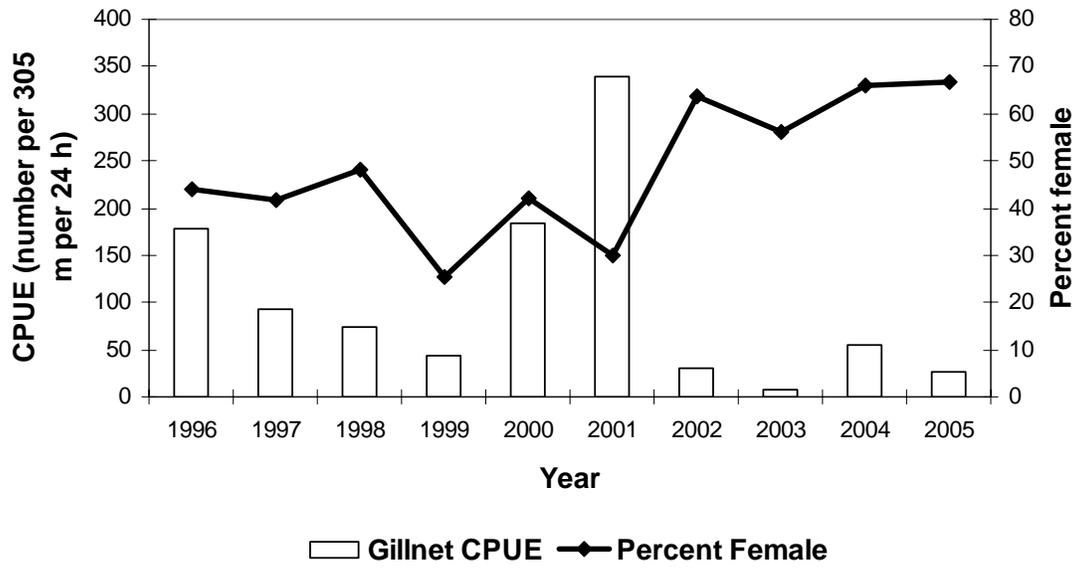


Figure 1. Adult yellow perch gill net catch-per-unit-effort and percent female in the catch at four southern Lake Michigan ports (Grand Haven, Saugatuck, South Haven, and St. Joseph, MI). (MDNR; data from April-June, 1996 – 2005).

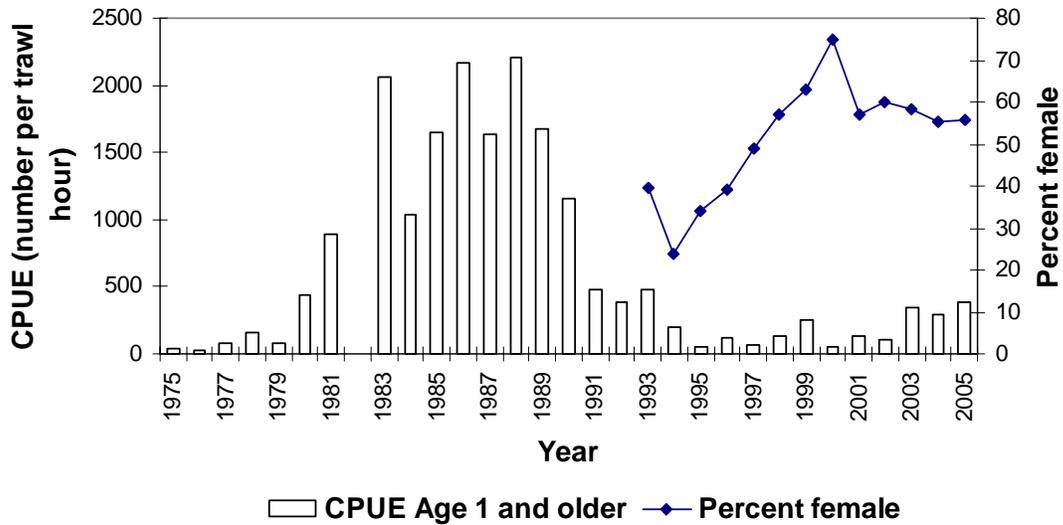


Figure 2. Adult yellow perch trawl CPUE and percent female in Indiana waters of Lake Michigan. (Ball State University; data from summer trawl survey at sites M and K in 1975 – 2005).

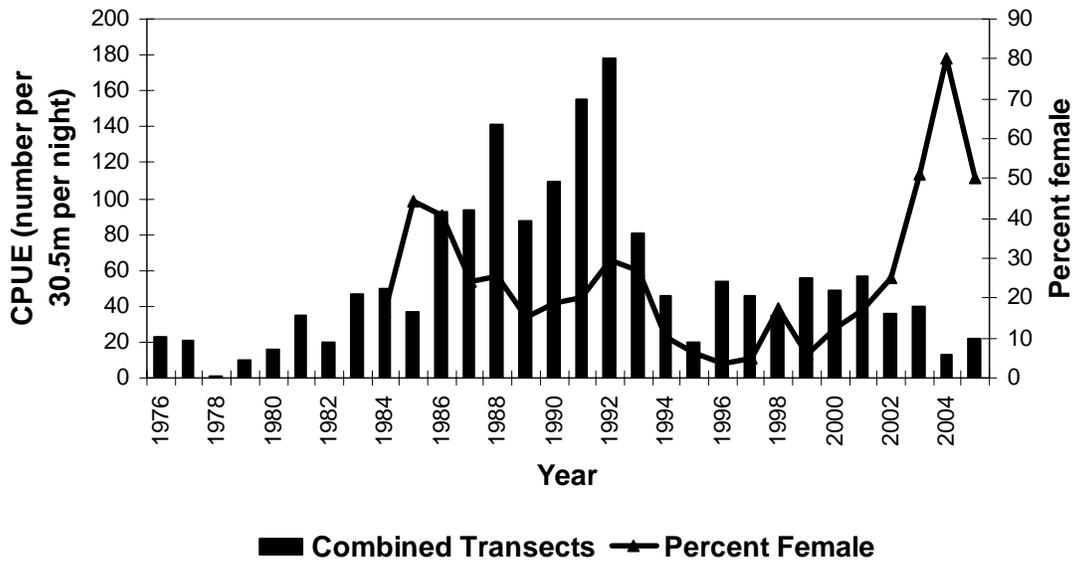


Figure 3. Adult yellow perch relative abundance and percent female in the Illinois waters of Lake Michigan. (ILDNR; data from spring gill net assessment, Chicago and Lake Bluff, IL, 1976 – 2005).

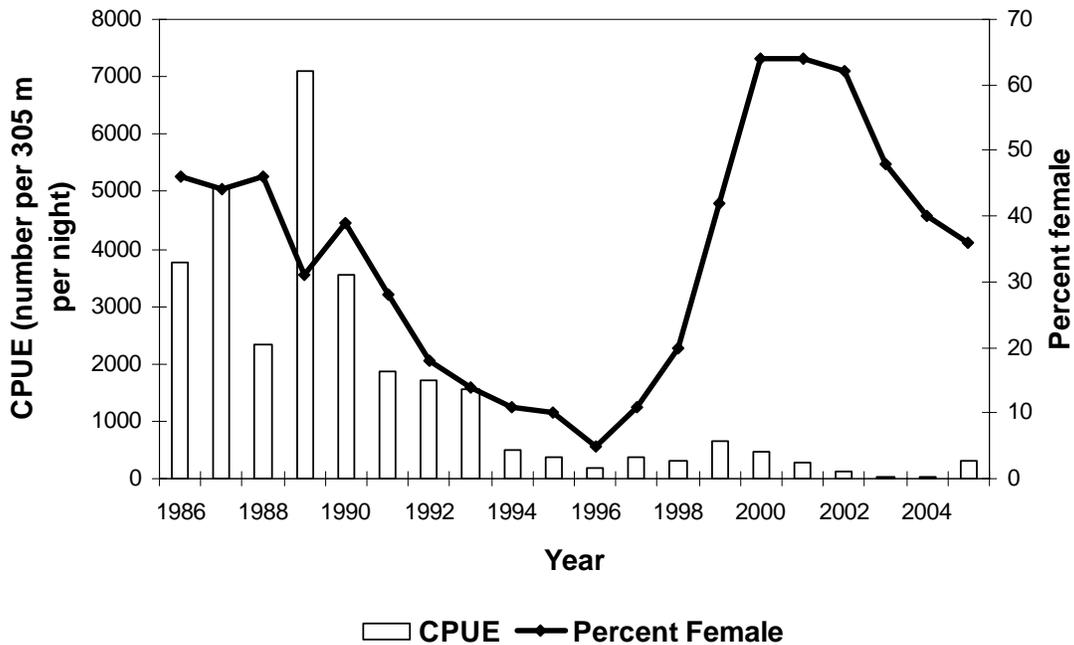


Figure 4. Adult yellow perch relative abundance and percent female in the Wisconsin waters of Lake Michigan. (WDNR; data from winter gill net assessment, Milwaukee, WI, 1986 – 2005).

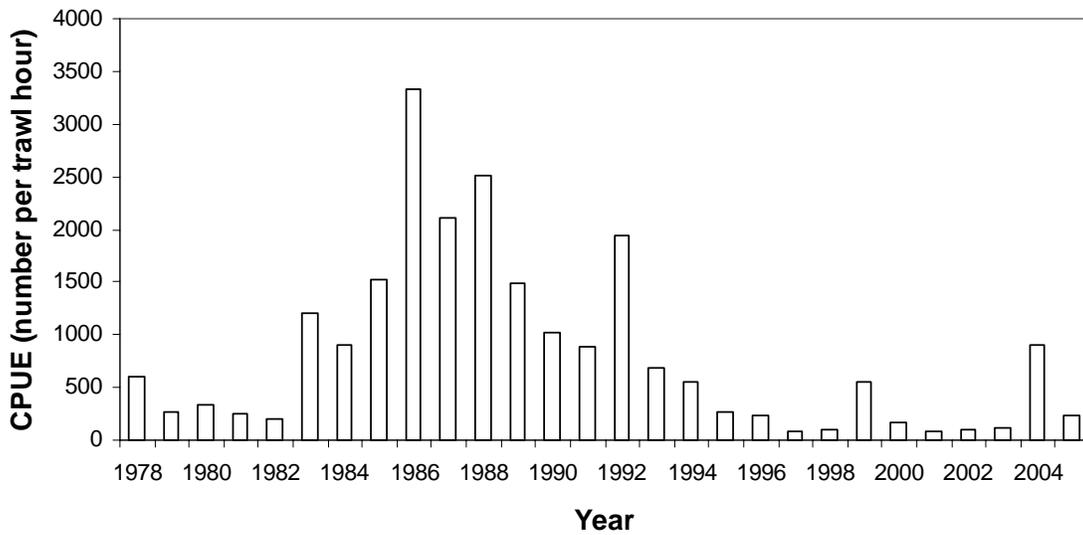


Figure 5. Relative abundance of age 1 and older yellow perch from southern Green Bay. (WDNR; data is the weighted area average from fall bottom trawls, Green Bay, WI, 1978 – 2005).

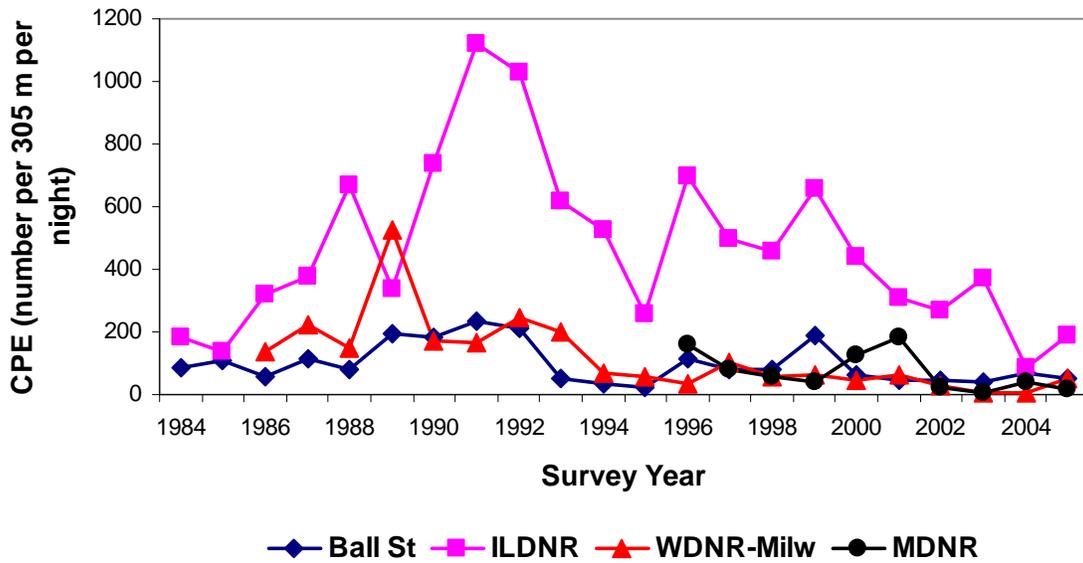


Figure 6. Yellow perch CPE (number of fish per 305 m) in graded mesh gill net consisting of equal length panels of 51mm, 64mm, and 76mm stretched mesh. (Data from BSU, ILDNR, WDNR, and MDNR; 1997-2000 & 2002-2005 MDNR values calculated from 1996 and 2001 selectivity evaluations).

Population Age Structure

The yellow perch adult population age structure was determined by evaluating otoliths, opercles, or spines. Although differences in aging techniques and collection methods and times occur between agencies, the 1998 class (age 7) continued to dominate the adult population in most areas and assessments (Figures 7, 9, 11). Bottom trawl assessments of the yellow perch population in Wisconsin waters of Green Bay (Figure 12) and Indiana waters of the main basin (Figure 8) also showed increasing recruitment and contribution to the adult population of the 2002-2004 year classes. Successful recruitment of the 2002 year class was also apparent in gill net catches from Michigan (Figure 7), Illinois (Figure 9), and Wisconsin (Figure 11) waters. These data are indicative of successful reproduction by the relatively strong 1998 year class.

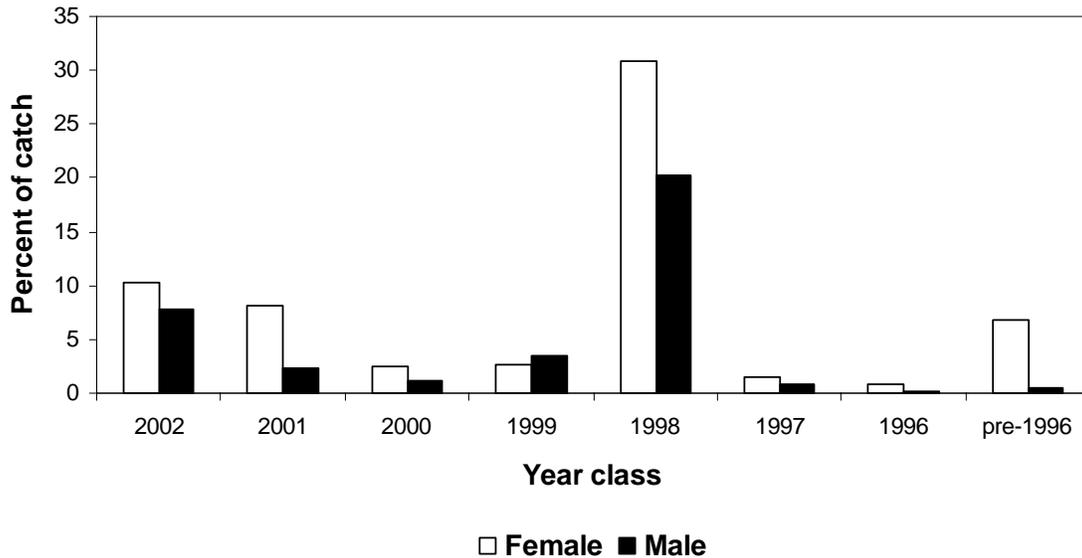


Figure 7. Yellow perch age structure from the Michigan waters of Lake Michigan. (MDNR data from spring gill net assessment combined four southern Lake Michigan Ports (Grand Haven, Saugatuck, South Haven, and St. Joseph, MI) 2004. Age determined using otoliths)

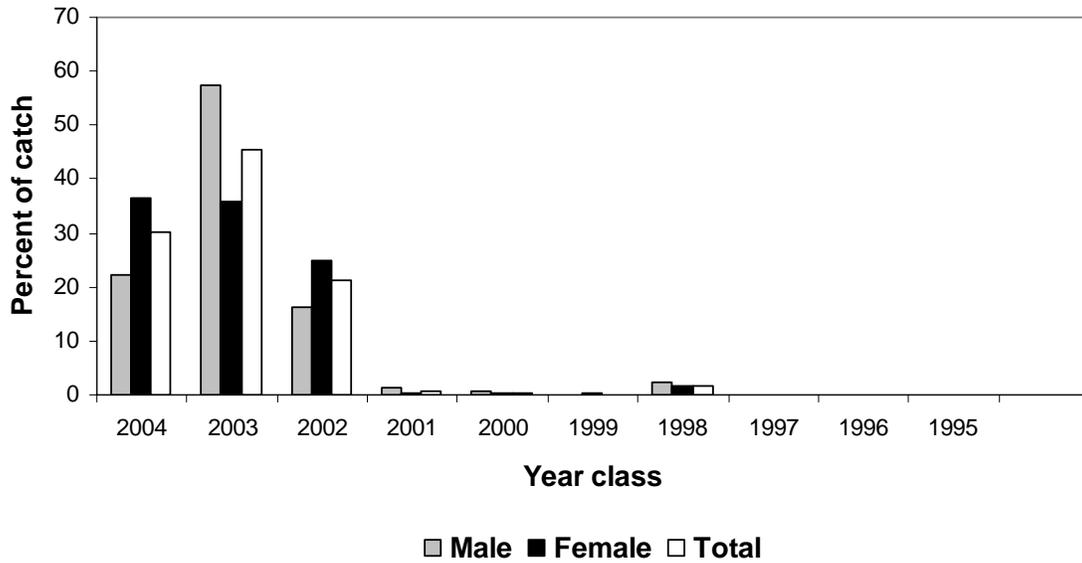


Figure 8. Yellow perch age structure from the Indiana waters of Lake Michigan. (Ball State University; data from summer trawl survey at sites M and K, Indiana, 2005. Ages determined using opercles).

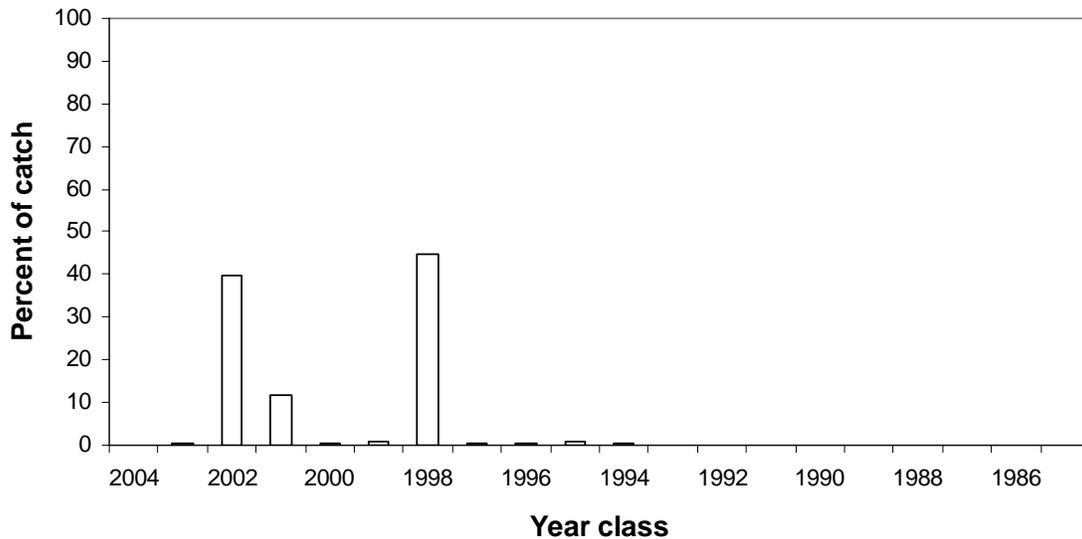


Figure 9. Yellow perch age structure from the Illinois waters of Lake Michigan. (ILDNR; data from spring gill net assessment, Chicago and Lake Bluff, IL, 2005. Ages determined using otoliths).

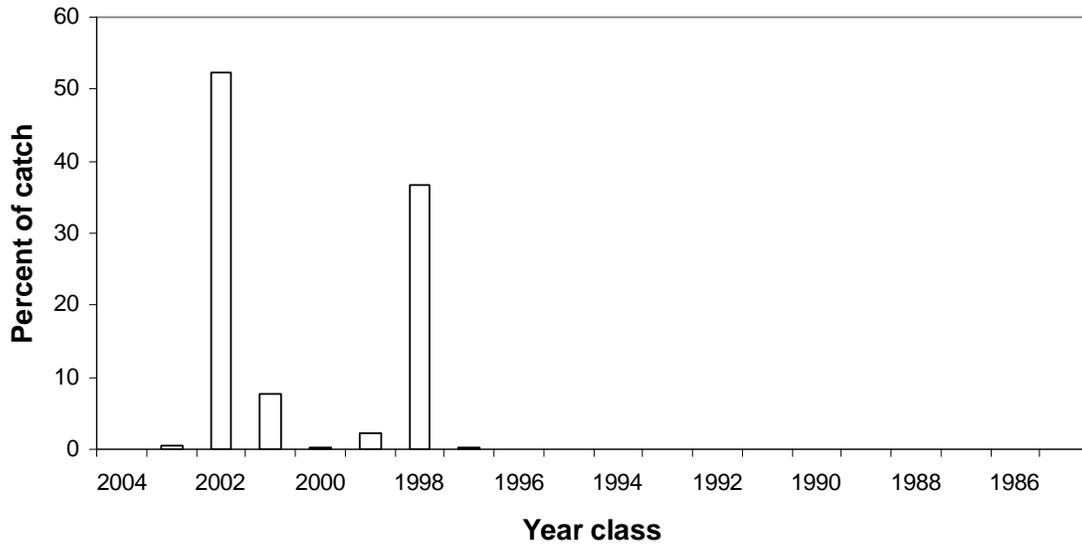


Figure 10. Yellow perch age structure from the Illinois waters of Lake Michigan. (INHS; data from spring fyke net sampling, Waukegan and Lake Bluff, IL, 2005. Ages determined using otoliths)

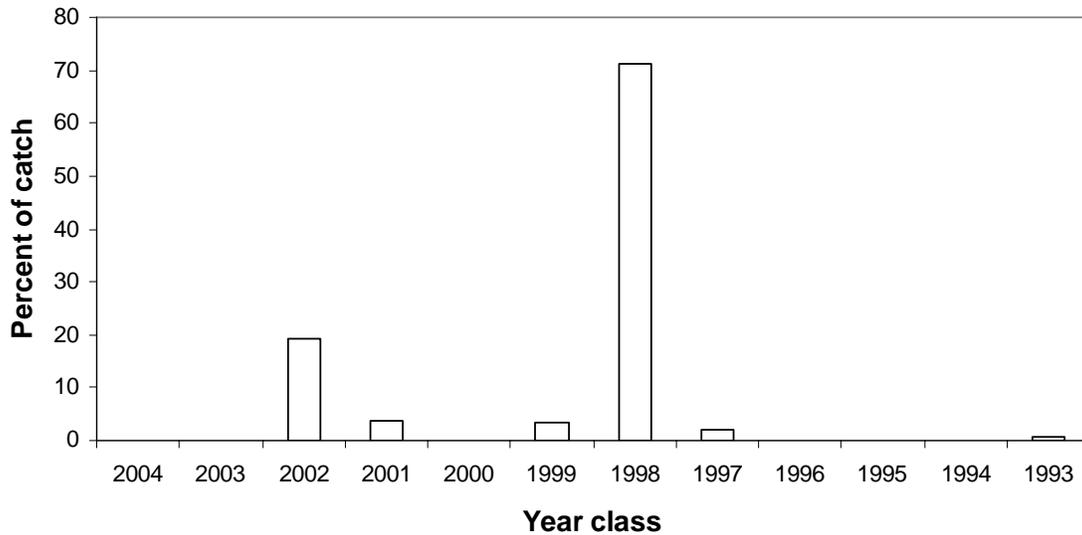


Figure 11. Yellow perch age structure from the Wisconsin waters of Lake Michigan. (WDNR; data from winter gill net assessment, Milwaukee, WI, 2005. Ages determined using spines).

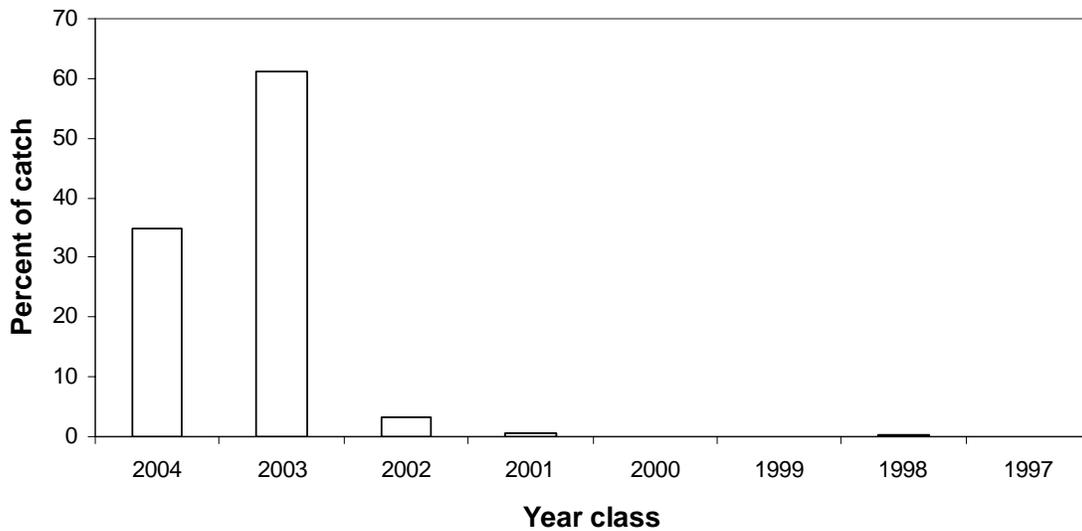


Figure 12. Yellow perch age structure from the Wisconsin waters of Green Bay. (WDNR; data from fall trawl assessment, Green Bay WI, 2005. Ages determined using spines).

Recruitment

Having a reliable indicator of future inputs to an adult population is vital to understanding the dynamics of the fish population and helping predict changes in abundance. An early indicator of recruitment is most beneficial to managers. In Lake Michigan, indicators of this information are collected using bottom trawls or beach seines. Recruitment of young-of-the-year YOY (age-0) yellow perch in 2005 were the highest in the time series for Michigan (Figure 13) and Wisconsin (Figure 17) waters of the main basin, and the highest in 15 years for Indiana (Figure 14; age 2) and Illinois (Figure 16) waters. Measurable recruitment was also observed in Green Bay (Figure 18), although catch-per-unit-effort of age 0 yellow perch in Green Bay in 2005 was less than 20% of that observed in 2003 (the largest year class recorded in the Green Bay time series).

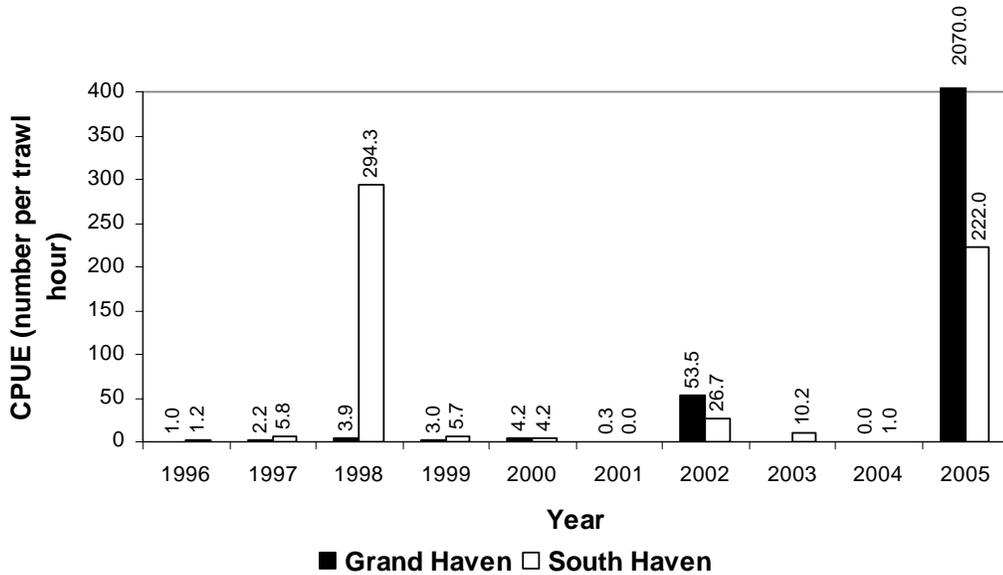


Figure 13. CPUE of age-0 yellow perch in the Michigan waters of Lake Michigan. (MDNR; late summer bottom trawl data from Grand Haven and South Haven 1996 - 2005. Grand Haven was not sampled in 2003.)

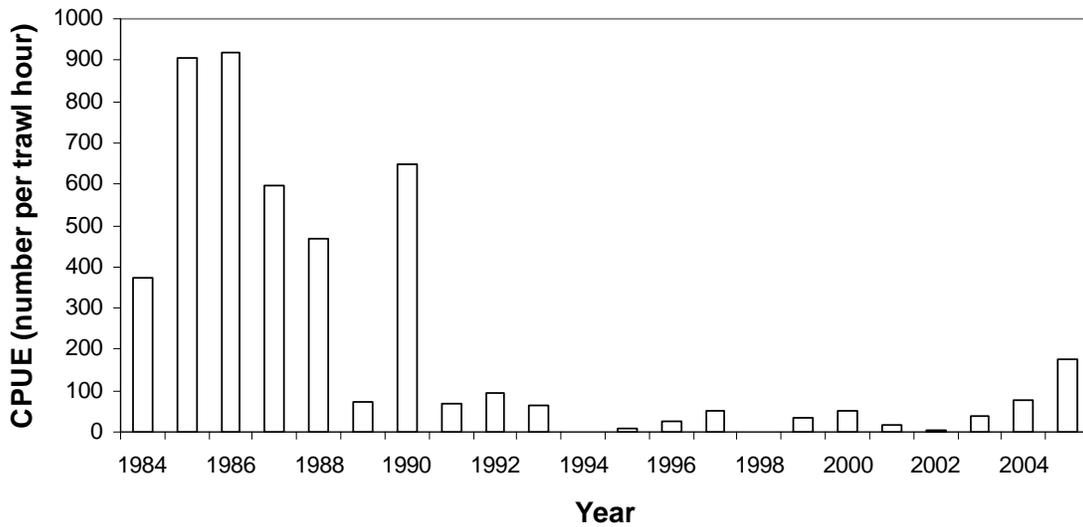


Figure 14. CPUE of age-2 yellow perch from the Indiana waters of Lake Michigan. (Ball State University; data from summer bottom trawl assessments, 1984 - 2005).

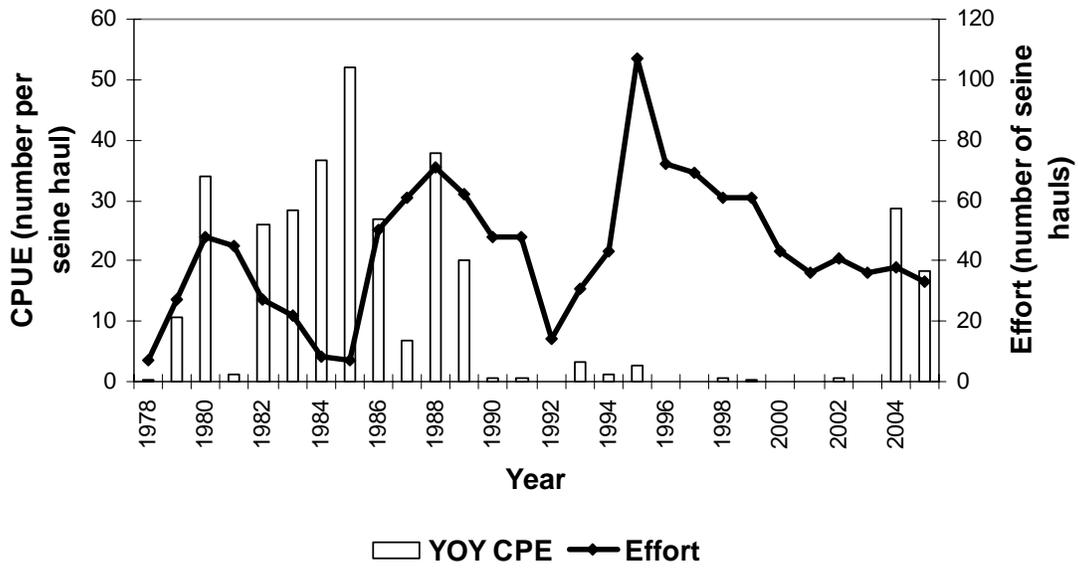


Figure 15. CPUE of YOY yellow perch from the Illinois waters of Lake Michigan. (ILDNR; data from summer beach seining along the Illinois shoreline, 1978 – 2005)

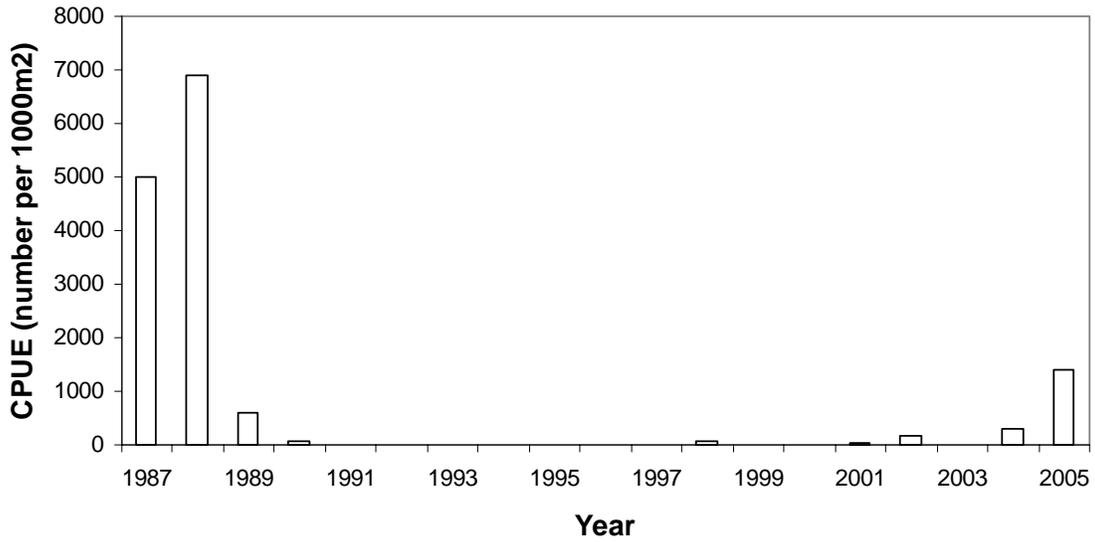


Figure 16. CPUE of age-0 yellow perch in the Illinois waters of Lake Michigan. (INHS; data from summer and fall bottom trawls off Waukegan, IL, 1987 – 2005).

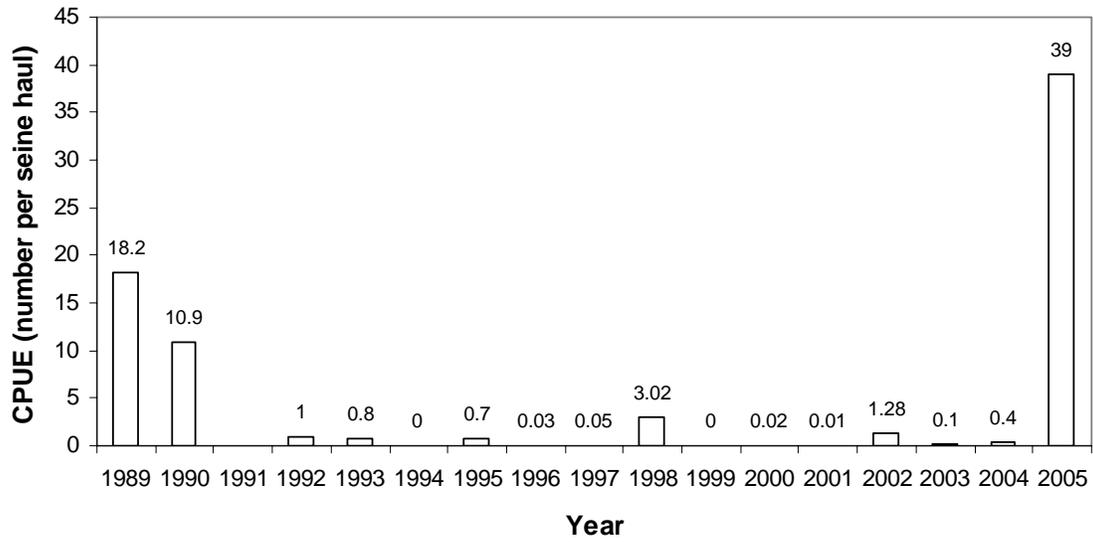


Figure 17. CPUE of age-0 yellow perch from the Wisconsin waters of Lake Michigan. (WDNR; data from summer beach seine assessments along the southern Wisconsin shoreline, 1989 – 2005).

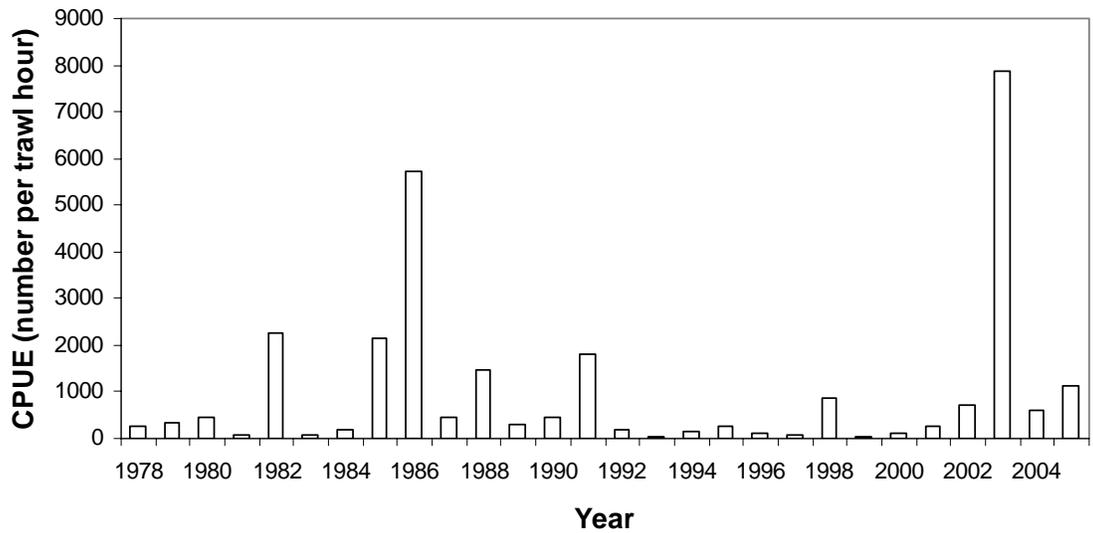


Figure 18. CPUE of age-0 yellow perch from the Wisconsin waters of Green Bay. (WDNR; weighted area average of fall bottom trawl assessment in southern Green Bay, 1978 – 2005).

2006 Yellow Perch Harvest Restrictions

Sportfishing regulations:

- Illinois
 - July closed to sportfishing for yellow perch (exception: under 16 years of age – 10 fish bag limit)
 - Daily bag limit 15 fish
- Indiana
 - No closed season for yellow perch
 - Daily bag limit 15 fish
- Michigan
 - No closed season for yellow perch
 - Daily bag limit 35 fish (south of the 45th parallel)
- Wisconsin (Lake Michigan)
 - May 1 through June 15; closed to sportfishing for yellow perch
 - Daily bag limit 5 fish
- Wisconsin (Green Bay)
 - March 16 through May 19; closed to sportfishing for yellow perch
 - Daily bag limit 15 fish

Commercial regulations:

- Illinois perch fishery remained closed
- Indiana perch fishery remained closed
- Michigan does not allow a commercial harvest (outside of 1836 Treaty waters)
- Wisconsin perch fishery remained closed (outside of Green Bay, where quota is 60,000 pounds)

Yellow Perch Task Group Progress Report

The Yellow Perch Task Group (YPTG) was formally given four charges by the Lake Michigan Committee in May 2000, and an additional fifth charge in March 2003:

- 1. Develop a Lakewide Assessment Plan for yellow perch and associated fish species by formalizing the procedures utilized to achieve compatibility of information and to standardized sampling methodology for yellow perch;**
- 2. Formally summarize, in a GLFC report, a Fisheries article, or through other means, the work previously conducted by the Yellow Perch Task Group that addressed the original hypothesis set forward for yellow perch recruitment failure;**
- 3. Identify any additional work necessary to address the original hypotheses for yellow perch recruitment failure;**
- 4. Develop and implement a lakewide population model that describes the yellow perch population in Lake Michigan providing estimates of total abundance, age and size structure, and geographical distribution.**
- 5. Complete a review of assessment data collected during 2003, and advise the LMC about potential risks to Lake Michigan yellow perch populations if current harvest regulations are maintained.**

The following section of this report provides a brief summary of the progress made towards the completion of these four charges.

Charge #1: Lakewide Assessment Plan. A Lakewide Assessment Plan being developed by the YPTG will formalize the standard procedures utilized to sample yellow perch throughout Lake Michigan. The yellow perch section of the Lakewide Assessment Plan will be appended to the plans previously developed for lake trout, burbot, and Chinook salmon by the Lake Michigan Technical Committee. Currently, researchers are attempting to develop an ideal sampling strategy as well as alternative strategy for offshore sampling. This will require identification of available vessels, transect design, procurement of equipment, and evaluation of day versus night sampling. Work to address this charge is ongoing; this report addresses, in part, the charge to “achieve compatibility of information”.

Charge #2: Formalize YPTG work. This charge was completed (in part) with the publication in November 2004 of an article in *Fisheries* (Clapp and Dettmers 2004). The article describes the development of a yellow perch research initiative on Lake Michigan, and the progress made towards addressing yellow perch recruitment questions. This article is viewed as a companion piece to Francis et al. (1996), which described declining

recruitment of Lake Michigan yellow perch and formation of the Yellow Perch Task Group. The Task Group anticipates publication of a third article, describing conclusions of the research initiative (by 2010).

Charge #3: Identify any additional work to address yellow perch recruitment failure. 2005 marked the eighth year of the lakewide research initiative implemented by the Lake Michigan Management Agencies in 1997. The goal of this research effort is to identify likely causes for the lack of perch recruitment observed in Lake Michigan in the early 1990s. The Lake Michigan Yellow Perch Task Group has addressed several hypotheses that may be limiting the survival of yellow perch (see the 2000 and 2001 YPTG Progress Reports – cited in “References” section – as well as Clapp and Dettmers 2004, for a list of hypotheses and the work conducted to address the hypotheses). Additional work to address questions related to recruitment of Great Lakes yellow perch is ongoing.

Charge #4: Develop and implement a lakewide yellow perch population model. Statistical catch-at-age models were developed for each region (Wisconsin, Illinois, and Indiana-Michigan) of the Lake Michigan yellow perch fishery (Wilberg et al. 2005). Indiana and Michigan were combined due to a limited long-term data set from Michigan and insufficient commercial fishery data from Indiana. However, both the Wisconsin and Illinois models provided useful information which is applicable to Indiana and Michigan based on our current understanding of the yellow perch population from those regions. During 2005-06, population modeling work has continued as part of an effort to develop decision analysis tools, and to apply these tools to evaluate harvest policies for yellow perch in the southern portion of the main basin of Lake Michigan.

Charge #5: Complete a review of assessment data collected during 2003 and advise the LMC about potential risks to Lake Michigan yellow perch populations if current harvest regulations are maintained. Work to address Charge #5 was described in the 2004 report of the Yellow Perch Task Group to the Lake Michigan Committee (Makauskas and Allen 2004). At that time, the Yellow Perch Task Group recommended retaining the current harvest regulations, pending additional analyses of available and subsequently-collected data. Agency members were in agreement to continue to have two meetings a year, with one meeting held to discuss management recommendations, similar to the September 22, 2003 meeting and the second to include the research aspect of the LMYPTG. The management meeting will be in the fall or winter and address annual assessments, modeling efforts, and other areas of importance to potential management actions by the LMC. This structure recognizes a transition from a task group primarily focusing on research questions (recruitment failures) to one focusing jointly on recruitment questions and implementation of a lake-wide management strategy for the Lake Michigan yellow perch fishery, utilizing annual assessments and modeling efforts. The logical next step in our modeling efforts is to begin development of decision analysis / risk assessment models. These efforts will help to establish key reference points that

signal needed changes in harvest regulation and will provide a much-needed protocol for management decisions regarding the Lake Michigan yellow perch fishery. A second annual task group meeting will continue to focus on ongoing research updates and efforts related to understanding Lake Michigan yellow perch recruitment processes.

Task Group Meetings

The spring 2005 meeting of the YPTG was held on March 23-24, 2005, and coincided with the GLFC (“Upper Lakes”) meeting in Ypsilanti, Michigan. The primary focus of this meeting was a workshop to initiate development of decision analysis tools; the workshop was led by researchers from Michigan State University (Bence, Jones, and Wilberg).

The winter 2005 of the YPTG meeting was held on December 11 in Grand Rapids, Michigan, in conjunction with the Midwest Fish and Wildlife Conference.

A second decision analysis workshop is scheduled for March 28-29 in Michigan City, Indiana.

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Appendix 1. Lake Michigan statistical districts.

