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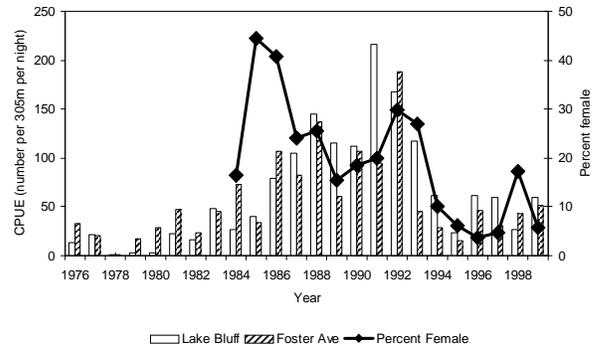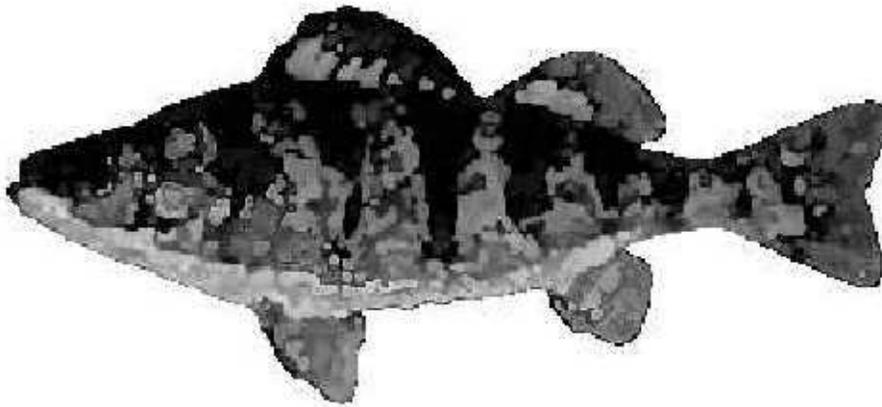


**REPORT OF THE LAKE MICHIGAN TECHNICAL COMMITTEE**

**Prepared by:**
**Dan Makauskas (ILDNR) and Dave Clapp (MDNR)**

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.

## Yellow Perch Task Group Contact List: 1999-2000

| NAME | AGENCY | E-MAIL | LAKE / SUBJECT AREA |
|---|---|---|---|
| Brian Belonger | Wisconsin DNR | belonb@dnr.state.wi.us | WM-1 |
| Fred Binkowski | Univ. of Wisconsin – Milwaukee | sturgeon@csd.uwm.edu | WM-5 / Lab |
| Mary Bremigan | Michigan State University | bremigan@pilot.msu.edu | Lab / Zooplankton |
| Dave Clapp | Michigan DNR | clappd@state.mi.us | MM-8 to MM-3 |
| Randy Claramunt | LTBB – Odawa Indians | ltbbnrc@freeway.net | MM-3 |
| John Dettmers | Illinois Natural History  Survey | dettmers@inhs.uiuc.edu | Illinois / Lab |
| Tim DeSourcie | USGS-BRD | tim_desourcie@usgs.gov | Lakewide |
| Mark Ebener | COTFMA | mebener@northernway.net | MM-3 |
| Guy Fleischer | USGS-BRD | guy_fleischer@usgs.gov | Lakewide |
| Richard Fulford | North Carolina State Univ. | rsfulfor@unity.ncsu.edu | WM-5 / Lab |
| Chris Heyer | Chesapeake Biological Lab. | heyer@cbl.umces.edu | WM-5 / Lab |
| Pradeep Hirethota | Wisconsin DNR | hiretp@dnr.state.wi.us | WM-5 |
| Bill Horns | Wisconsin DNR | hornsw@dnr.state.wi.us | WM-1 to WM-6 |
| John Janssen | Loyola University | jjansse@orion.it.luc.edu | Illinois |
| Dave Jude | CGLAS, Univ. of Mich. | djude@umich.edu | MM-8 to MM-7 |
| John Kubisiak | Indiana DNR | lmhq@netnitco.net | Indiana |
| Dan Makauskas | Illinois DNR | dmakauskas@dnrmail.state.il.us | Illinois |
| Sue Marcquenski | Wisconsin DNR | marcqs@dnr.state.wi.us | WI/Fish Disease |
| Archie Martell | LRB – Ottawa Indians | archandchuke@yahoo.com | MM-6 |
| Doran Mason | Purdue University | mason@glerl.noaa.gov | Hydroacoustics |
| Tom McComish | Ball State University | tmccomis@bsu.edu | Indiana |
| Scott McNaught | Central Michigan University | scott.mcnaught@cmich.edu | MM-6 / Lab |
| Tom Miller | Chesapeake Biological Lab. | miller@cbl.umces.edu | WM-5 / Lab |
| Eric Olsen | Grand Traverse Band | gtbbiocm@netone.netonecom.net | MM-4 |
| Steve Pothoven | GLERL/NOAA | pothoven@glerl.noaa.gov | MM-7 |
| Jim Rice | North Carolina State Univ. | jim_rice@ncsu.edu | WM-5 / Lab |
| Steve Robillard | Illinois DNR | srobilla@csd.uwm.edu | Illinois |
| Phil Schneeberger | Michigan DNR | schneebp@state.mi.us | MM-1 |
| Candy Schrank | Wisconsin DNR | schracs@dnr.state.wi.us | WI/Fish Disease |
| Steve Shroyer | Ball State University | sshroyer@bsu.edu | Indiana |
| Jim Thompson | Wisconsin DNR | thompjm@dnr.state.wi.us | WM-5 |

# Status of Yellow Perch in Lake Michigan

Yellow perch assessment activity is occurring throughout the lake but is focused mainly in the southern basin.  Numerous agencies and universities are 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) perch.  The second section examines the most recent age structure data available for various parts of the lake.  The final section consists of estimates or indices of yellow perch recruitment; most of this data comes from collections of age 0 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 - 6).  Generally this information shows a long-term decline in adult yellow perch abundance.  The longer-term data sets show peaks in the late 1980s or early 1990s, followed by significant declines through the mid-1990s (Figures 3 - 6).  Indices from recent years show what appears to be the beginning of a population recovery.  The fluctuations in abundance have also been accompanied by changes in the composition of the catch by sex (Figures 3 - 5).

## Population Age Structure

Adult population age structure determined from the different areas of the lake shows some variability (Figures 7 - 12).  Aging structures used by Lake Michigan management agency personnel and researchers include otoliths, opercules, scales, and spines, and the differences in collection methods and times, as well as aging methodology, could all contribute to the range of values reported.  While there is some variability in reported adult age structure, most people observed strong contribution of mid-1980's and / or mid- to late-1990's year classes, correlated with early recruitment indices based on trawl and seine assessments (see below).

Differences in aging methodologies are one reason for development of a lakewide assessment plan for yellow perch in Lake Michigan (see "Yellow Perch Task Group Progress Report", below).

## 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 abundance changes.  An <u>early</u> life stage indicator of recruitment is most beneficial to managers.  In Lake Michigan, indicators of recruitment vary from collections of age 0 yellow perch to adult age group abundance; the majority of this information is collected using bottom trawls or beach seines.  As with estimates of adult age structure (above), early estimates of recruitment also vary across the basin (Figures 13 -21).  In recent years, there appears to be significant survival of the 1998 year class.  These fish were caught in good numbers in Michigan waters (Figures 13, 14, and 18) and Green Bay (Figure 19) at age 0.  They were again captured at age 1 around the southern basin and Green Bay (Figures 9 and 11 – 14).
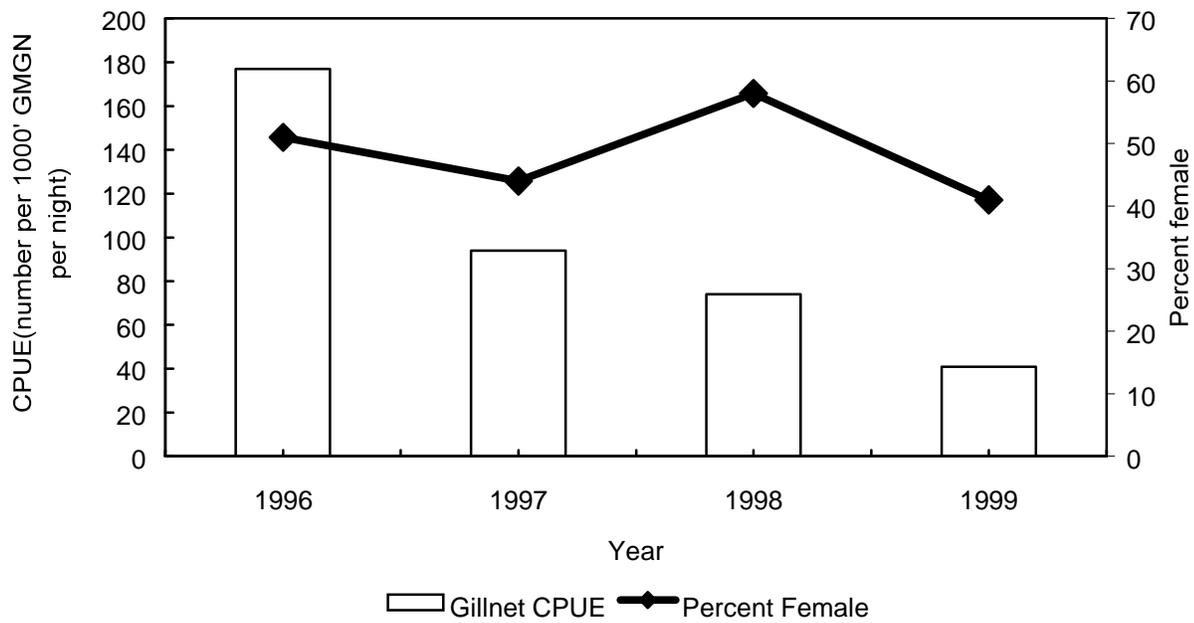
Figure 1.  Adult yellow perch gill net catch-per-unit-effort (number per 305m of net per night) and percent of females in the catch at four southern Lake Michigan ports (Grand Haven, Saugatuck, South Haven, and St. Joseph, MI).  (MDNR; data from April, 1996 – 1999).
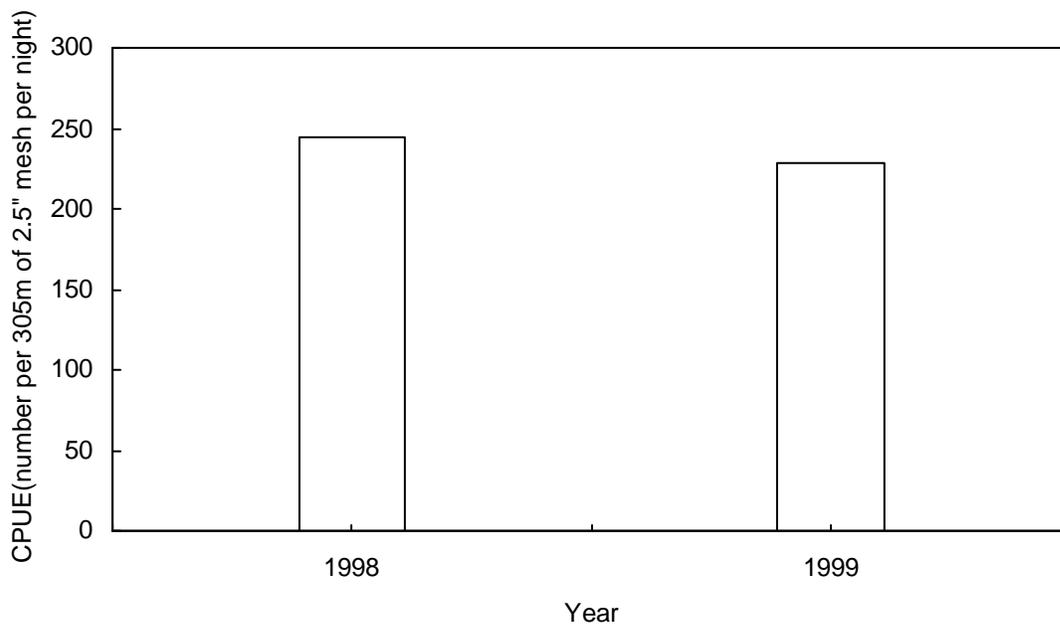


Figure 2. Adult yellow perch gill net catch-per-unit-effort (number per 305m of net per night of 2.5" mesh) at Muskegon.  (GLERL; data from spring and fall, 1998 – 1999).
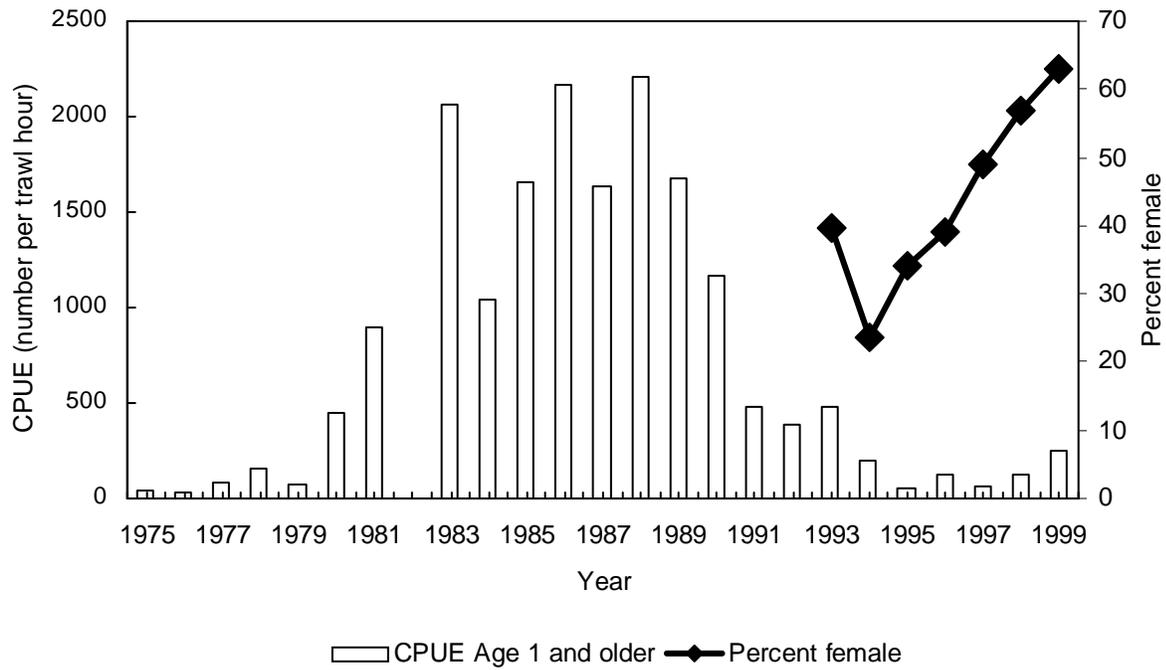
Figure 3. Adult yellow perch trawl CPUE (number per trawl hour) and percent female in Indiana waters of Lake Michigan. (Ball State University; data from summer trawl survey at sites M and K in 1975 – 1999).
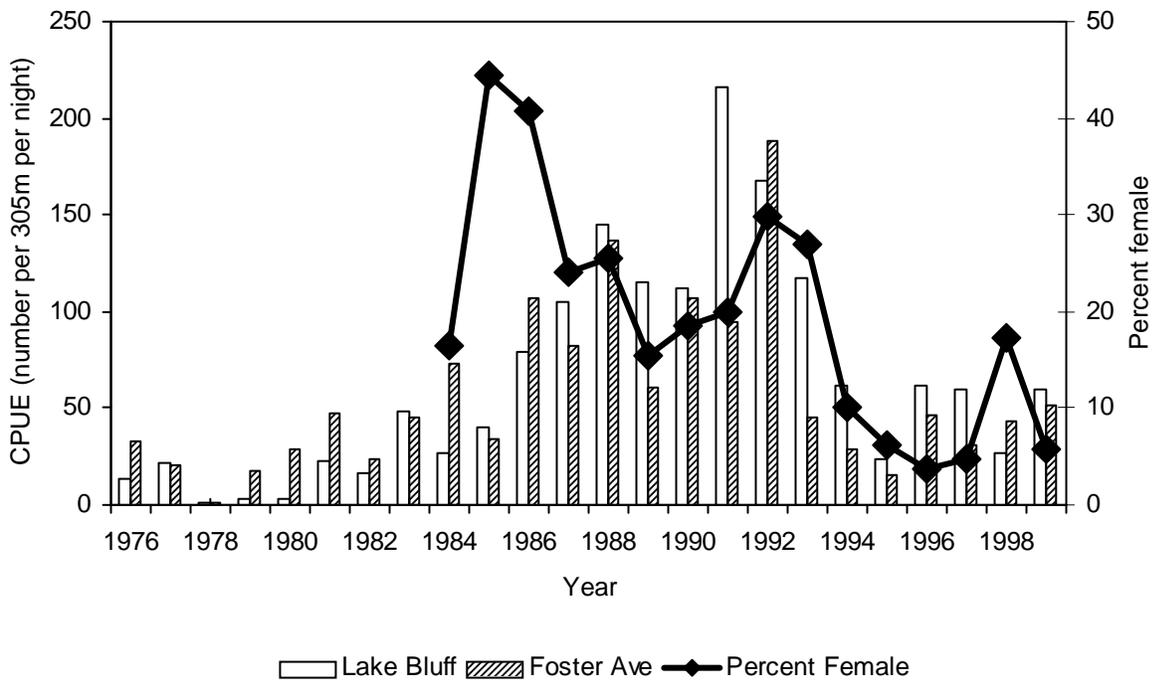


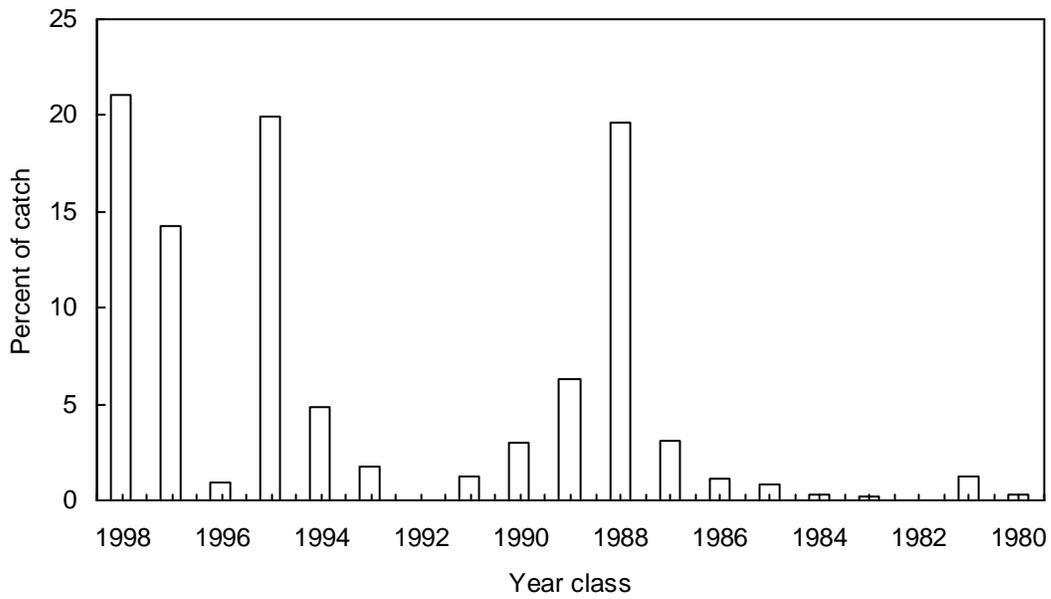Figure 4. Adult yellow perch relative abundance and percent female in the Illinois waters of Lake Michigan. (ILDNR; data from spring gill net assessment, Chicago and Lake Bluff, IL, 1976 – 1999).
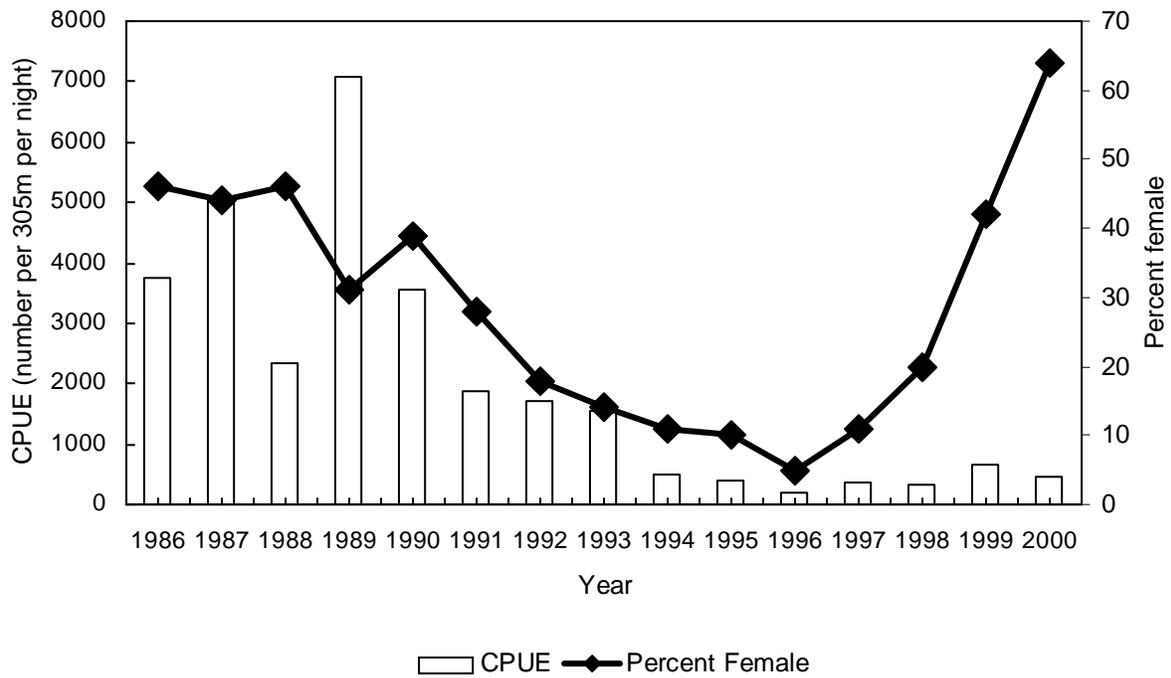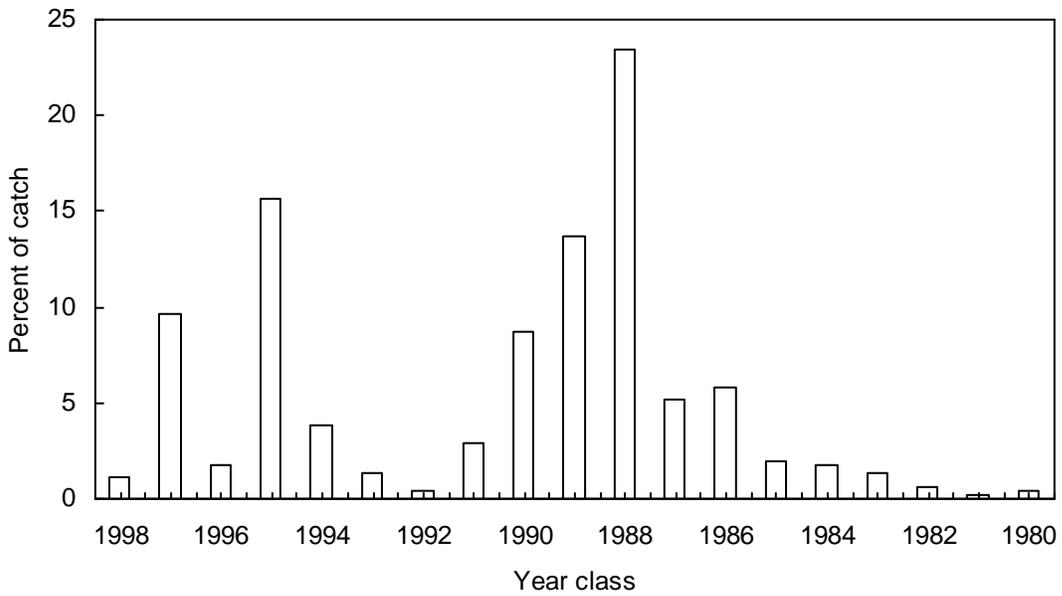
Figure 5. Adult yellow perch relative abundance and percent female in the Wisconsin waters of Lake Michigan.  (WDNR; data from winter gill net assessment, Milwaukee, WI, 1986 – 2000).
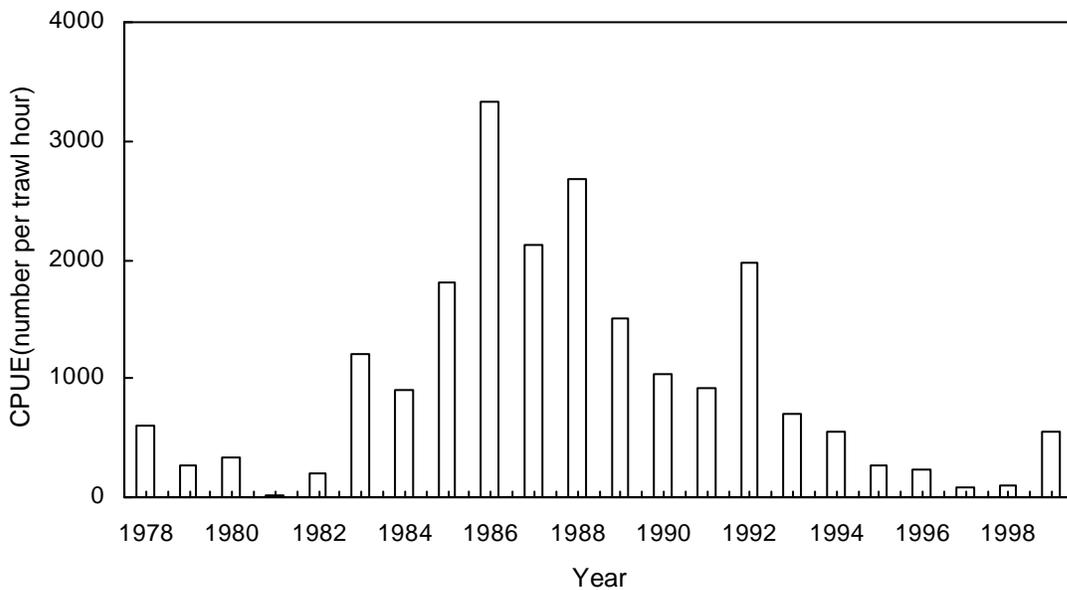


Figure 6.  Relative abundance of age 1 and older yellow perch from the Southern Green Bay.  (WDNR; data is the weighted area average from fall bottom trawls, 1978 – 1999).
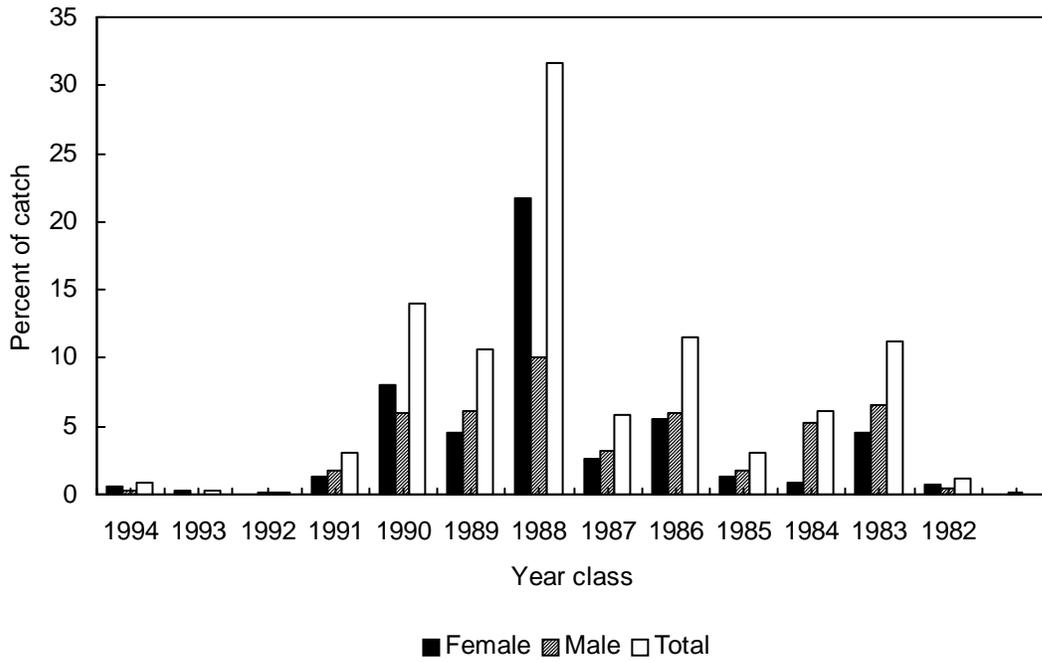
Figure 7.  Yellow perch age structure from the Michigan Waters of Lake Michigan.  (MDNR; data from spring gill net assessment at Grand Haven, Saugatuck, South Haven, and St. Joseph, MI, 1996.  Ages determined using otoliths).
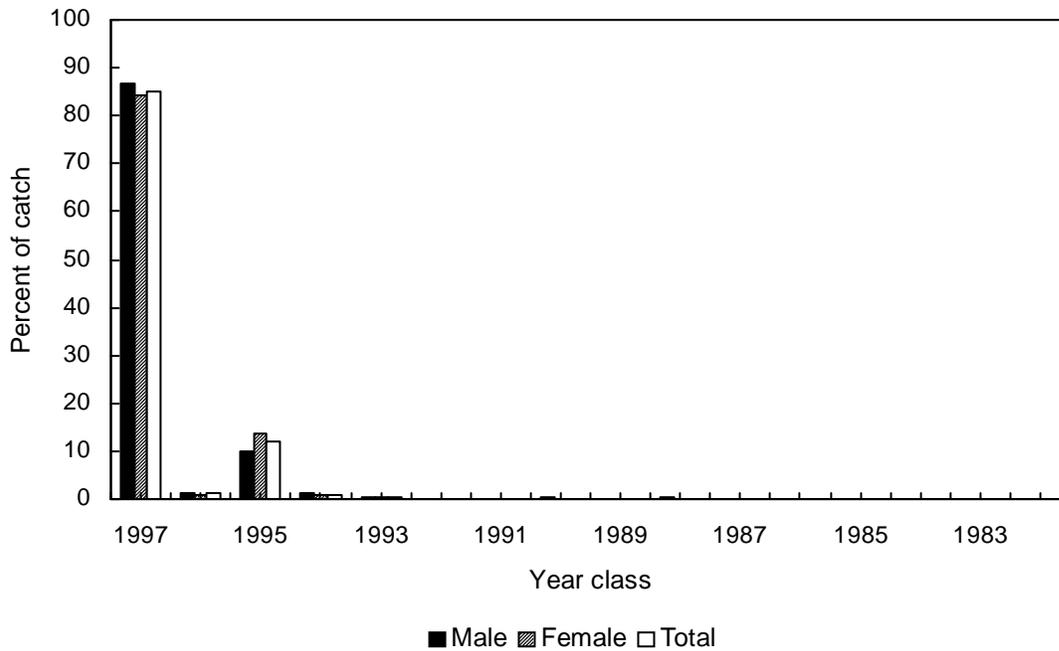


Figure 8.  Yellow perch age structure from the Indiana waters of Lake Michigan.  (Ball State University; data from summer trawl surveys at sites M and K, Indiana, 1998.  Ages determined using opercules).

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, 1999.  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, 1999.  Ages determined using otoliths).
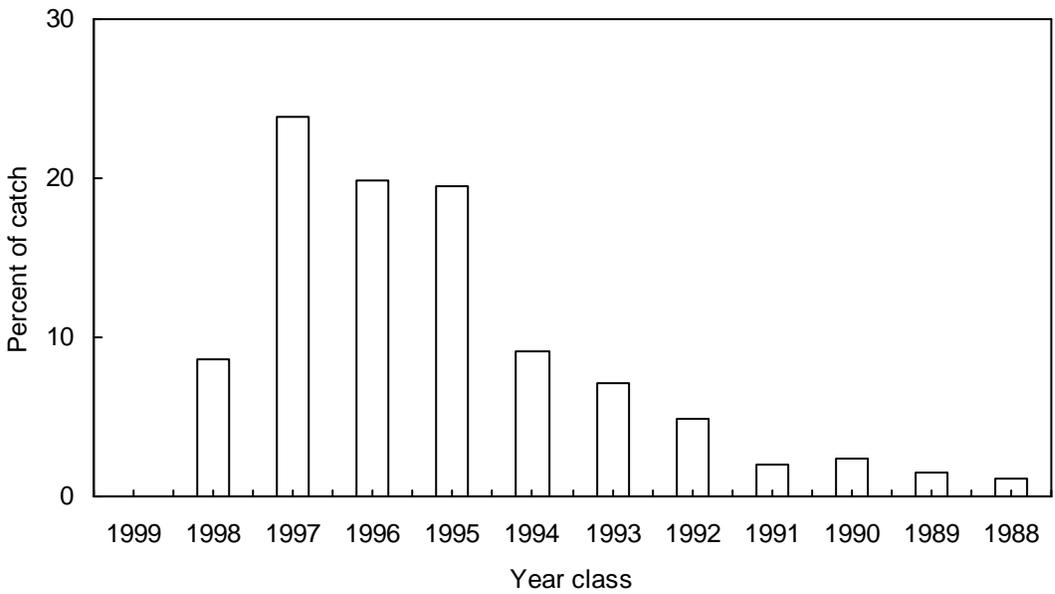
Figure 11.  Yellow perch age structure from the Wisconsin waters of Lake Michigan.  (WDNR; data from winter gill net assessment, Milwaukee, WI, 2000.  Ages determined using scales).
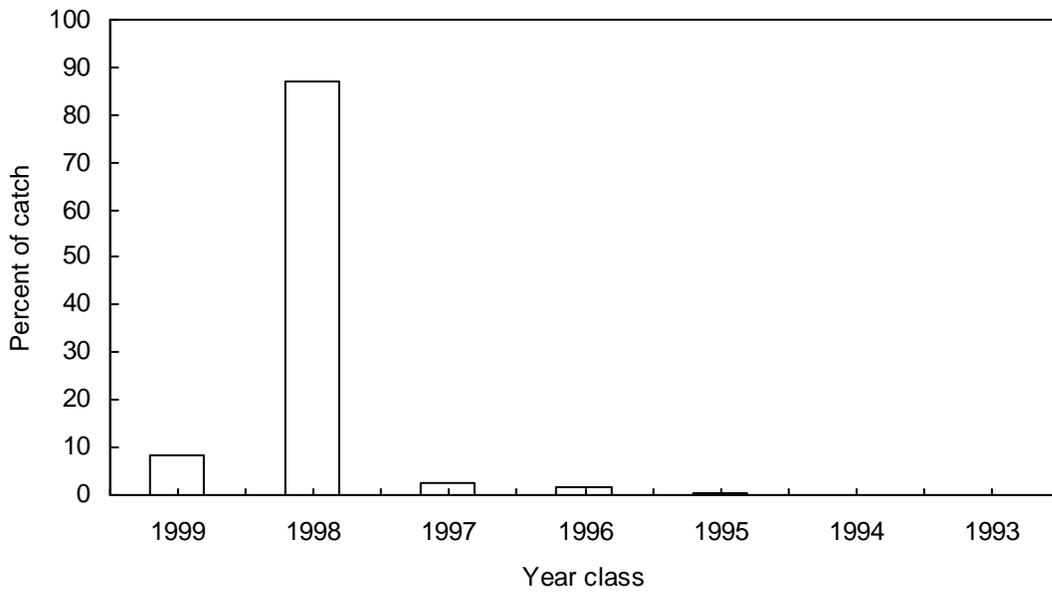


Figure 12.  Yellow perch age structure from the Wisconsin water of Green Bay.  (WDNR; data from fall trawl catches in Southern Green Bay, 1999.  Ages determined using spines).
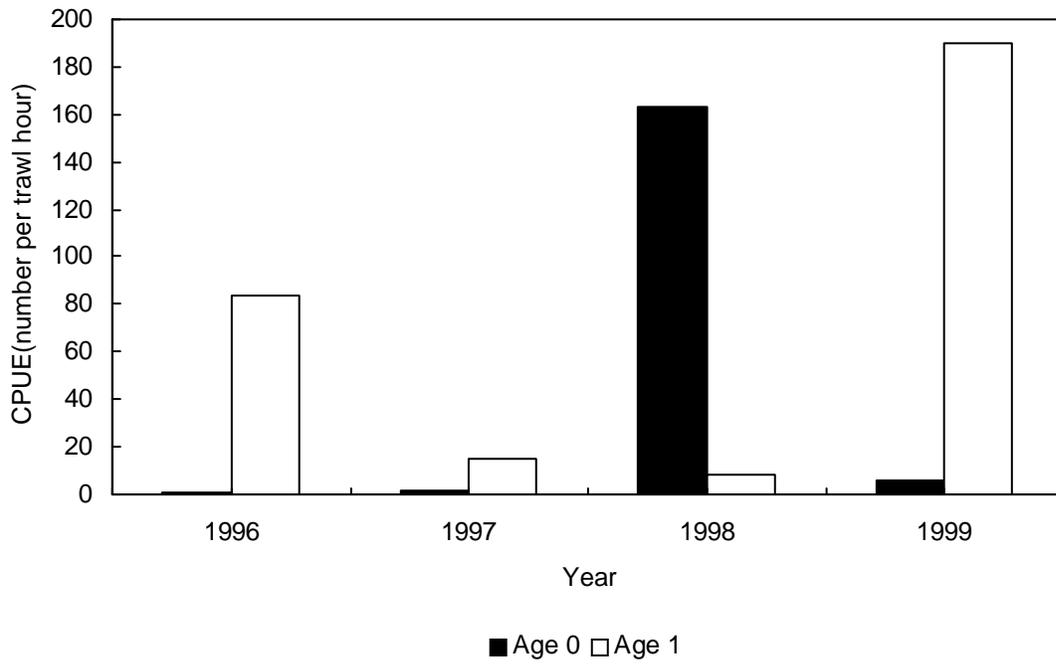
Figure 13.  CPUE (number per trawl hour) of age 0 and age 1 yellow perch in Michigan waters of Lake Michigan.  (MDNR; data from summer trawl assessment at Grand Haven, Saugatuck, South Haven, and St. Joseph, MI, 1996 – 1999).
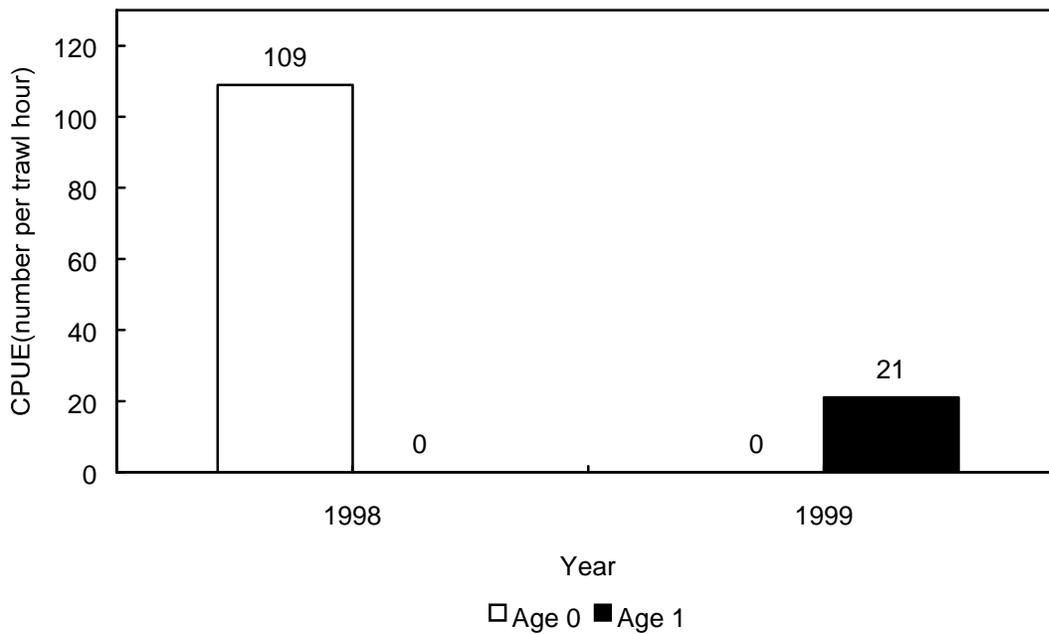


Figure 14.  CPUE (number per trawl hour) of age 0 and age 1 yellow perch in the Michigan waters of Lake Michigan.  (GLERL; data from bottom trawl surveys at Muskegon and St. Joseph, MI, 1998 – 1999).
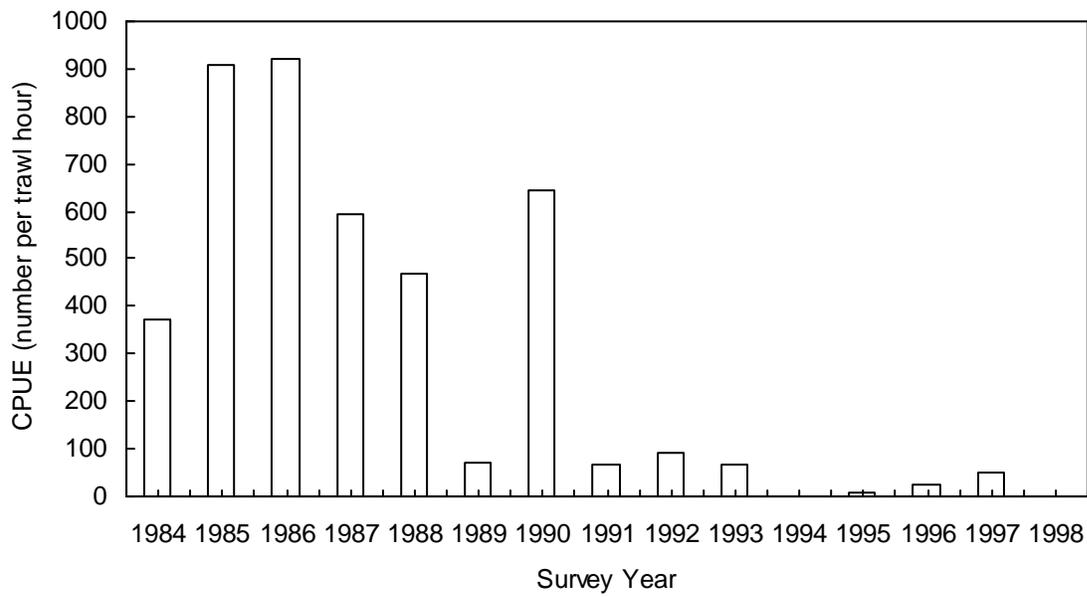
Figure 15. CPUE (number per trawl hour) of age 2 yellow perch from the Indiana waters of Lake Michigan. (Ball State University; data from summer bottom trawl assessments, 1984 – 1998).
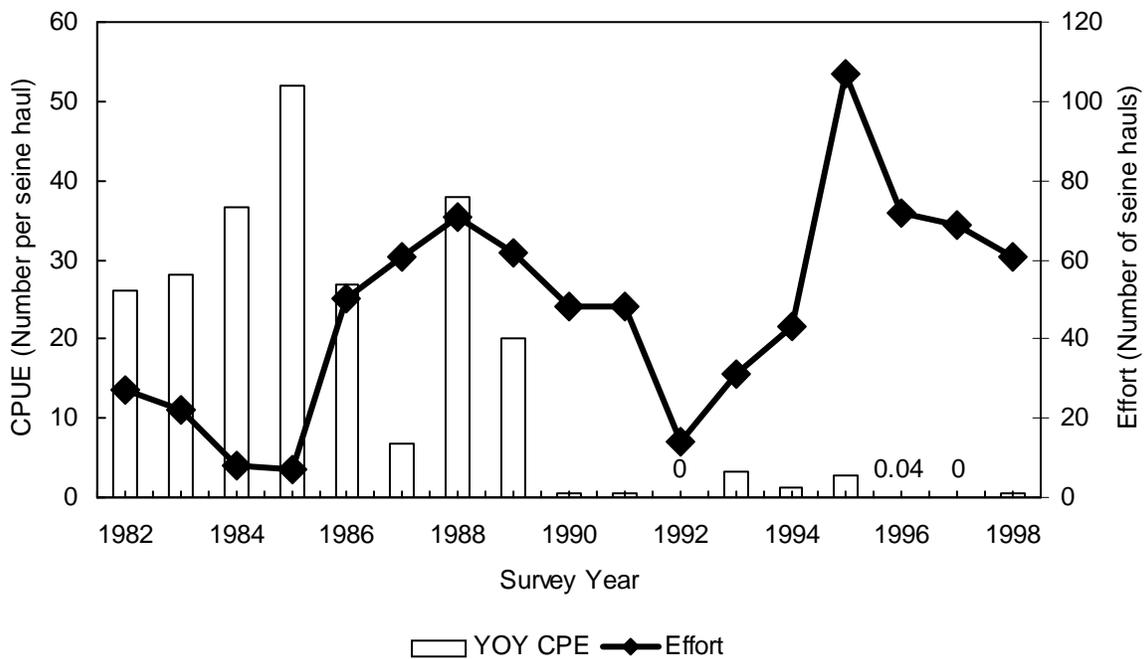


Figure 16. CPUE of YOY yellow perch from the Illinois waters of Lake Michigan. (ILDNR; data from summer beach seining along the Illinois shoreline, 1982 – 1999).
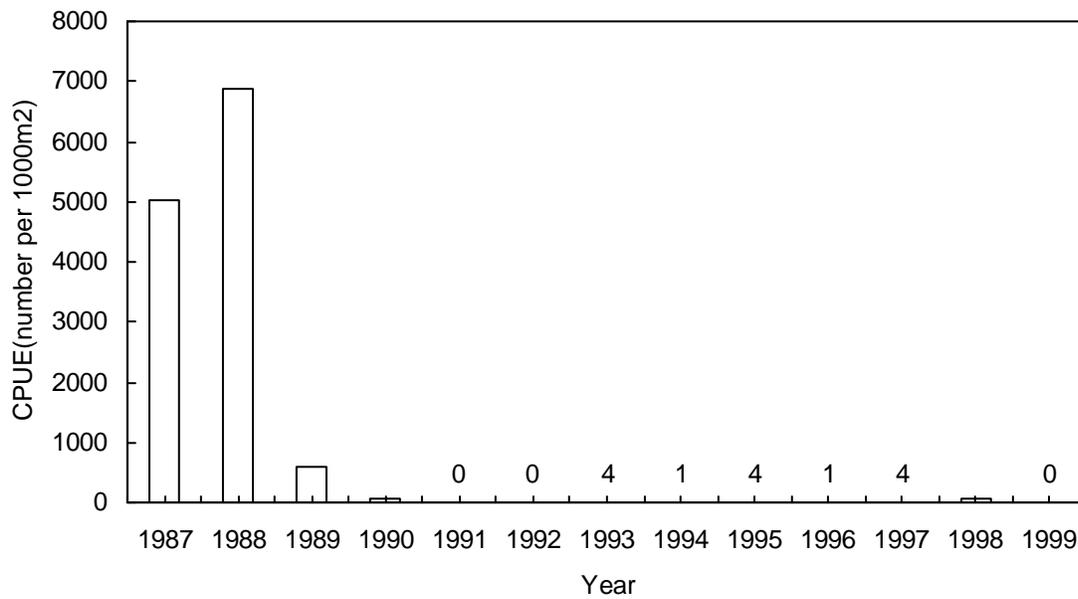
Figure 17.  CPUE (number per 1000m$^2$) of age 0 yellow perch in the Illinois waters of Lake Michigan. (INHS; data from summer and fall bottom trawls off Waukegan, IL, 1987 – 1999).
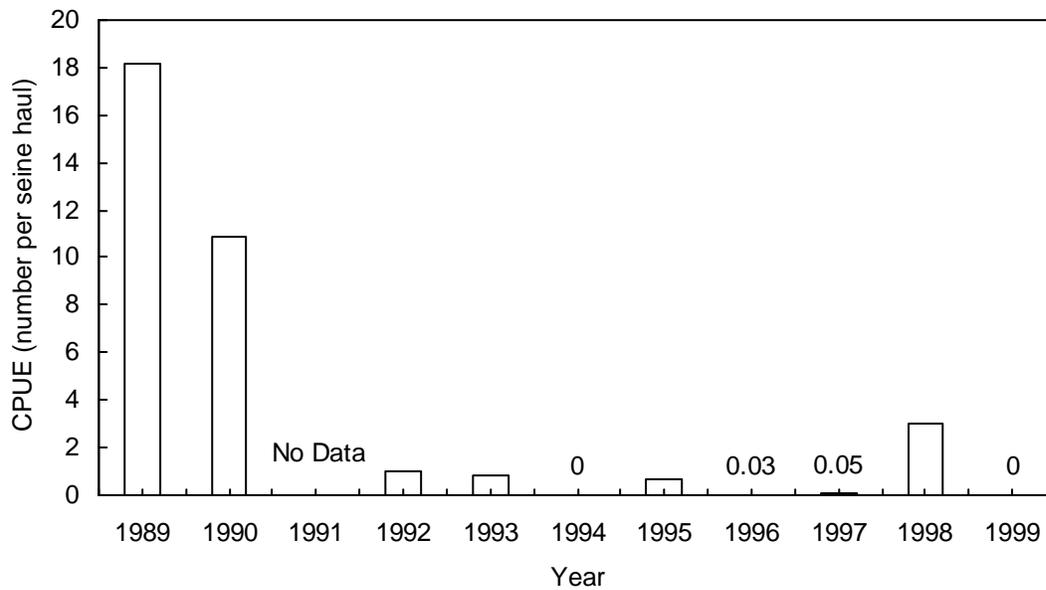


Figure 18.  CPUE (number per seine haul) of age 0 yellow perch from the Wisconsin waters of Lake Michigan.  (WDNR; data from summer beach seine assessments along the southern Wisconsin shoreline, 1989 – 1999).
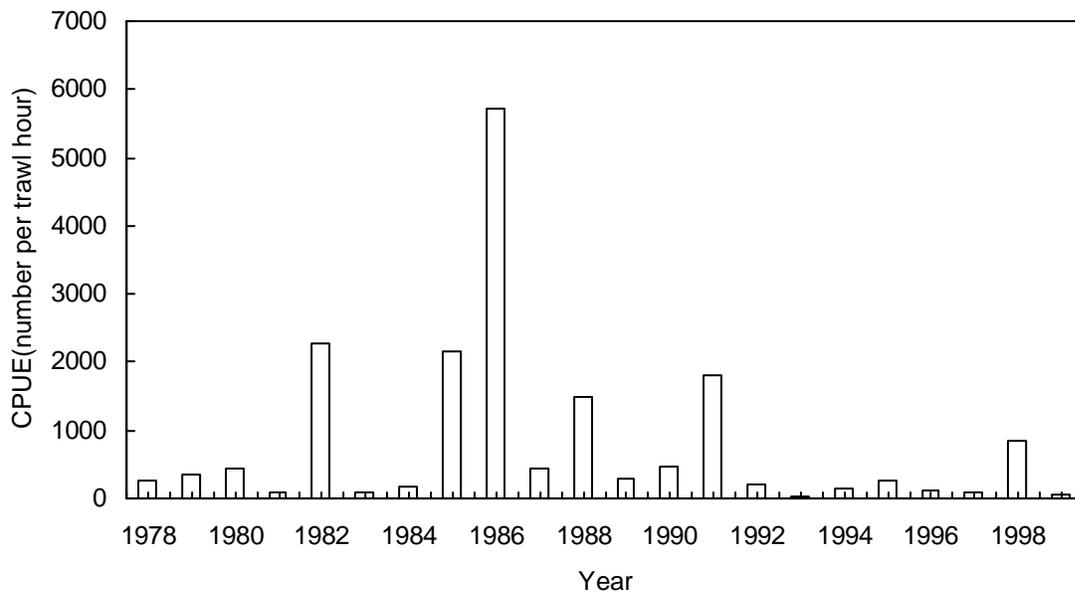
Figure 19.  CPUE (number per trawl hour) of age 0 yellow perch from the Wisconsin waters of Green Bay. (WDNR; weighted area average of fall bottom trawl surveys in Southern Green Bay, 1978 – 1999).
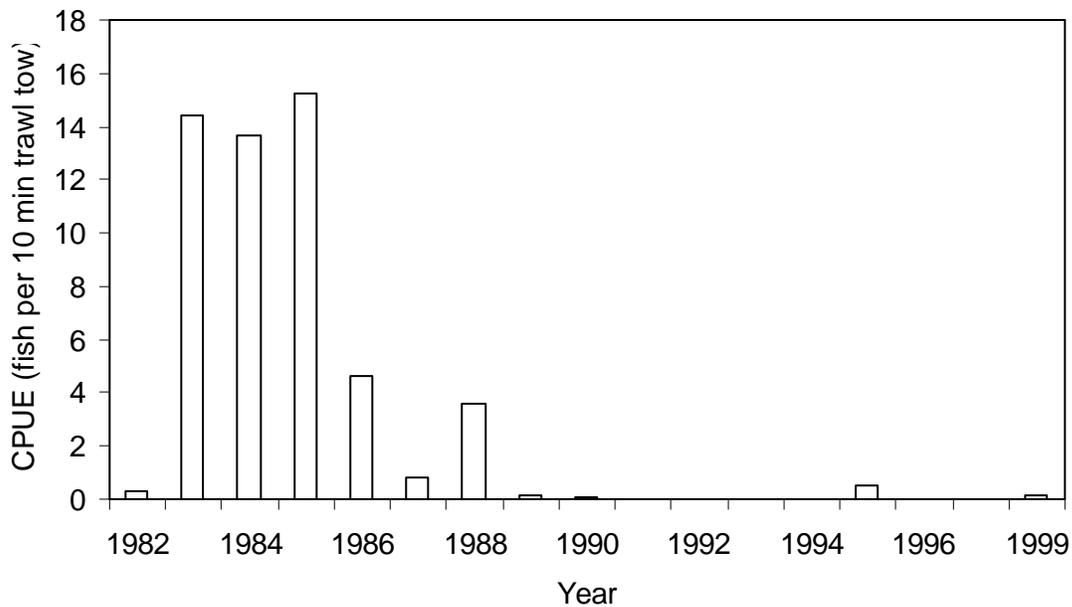


Figure 20. CPUE (number per 10 min trawl) of YOY (<100mm) yellow perch collected during lakewide USGS Lake Michigan fall forage assessments.  (USGS; data collected during 1982-1999).
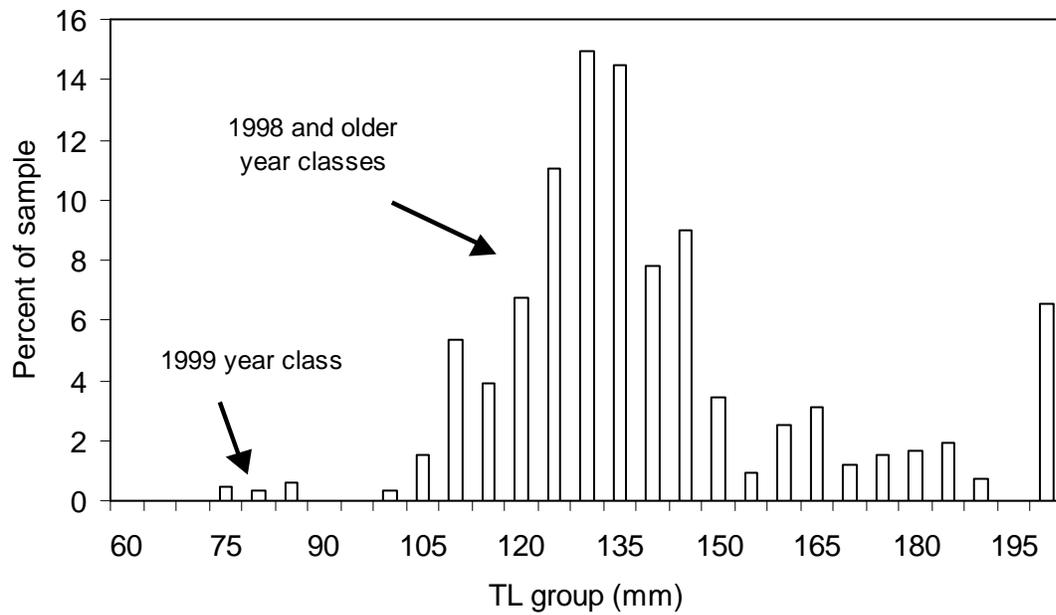
Figure 21. Lake Michigan yellow perch length frequency distribution. (USGS; data collected during lakewide Lake Michigan fall forage assessments, 1999. Total number of yellow perch sampled = 669. Year class assignments based on length distribution.).

## 1999 Yellow Perch Harvest Restrictions

Following the harvest restrictions imposed by the four Lake Michigan states in 1995, 1996, and 1997, there were no regulation changes in 1999.

Sportfishing regulations:

- Illinois
  - June closed to sportfishing for yellow perch
  - Daily bag limit 15 fish, with an 8 to 10 inch slot limit (perch less than 8 inches or greater than 10 inches must be released immediately)
- 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
  - June closed to sportfishing for yellow perch
  - Daily bag limit 5 fish

Commercial regulations:

- Illinois perch fishery remained closed.
- Indiana perch fishery remained closed.
- Michigan does not allow a commercial harvest.
- Wisconsin perch fishery remained closed (outside of Green Bay).