

Lake Michigan Committee
Milwaukee, WI
March 29-30, 1995
Agenda Item 4e.

REPORT OF THE LAKE MICHIGAN TECHNICAL COMMITTEE

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

Status of Yellow Perch in Lake Michigan

This status report was prepared by Rich Hess, IDOC, from information provided by the following contributors:

Mark Ebener, COTFMA - Northern Lake Michigan
Phil Schneeberger, MDNR - Little and Big Bays de Noc
Brian Belonger, WDNR - Green Bay
Mike Toneys, WDNR - Northern Green Bay (WI)
Mike Keniry, WDNR - Wisconsin waters, Southern Lake Michigan
Jim Francis, IDNR - Indiana waters
Ed Brown - NBS, Lakewide
Rich Hess, IDOC - Illinois waters

Northern Lake Michigan

Assessment data from this portion of the lake is sparse. Electrofishing in Epoufette Bay (one night only, 1.89 hours of effort) in September, 1994 by the COTFMA resulted in the capture of 31 young-of-the-year (YOY) perch per hour of effort. This catch rate was 43% lower than the 54 YOY perch per hour captured in 1993.

The Wisconsin DNR conducted some experimental trawling and shoreline seining in 1994 for juvenile perch along the Lake Michigan shore of Door County. The only concentrations of juvenile perch were found north of Bailey's Harbor in Moonlight Bay near the mouth of Reibolt's Creek. A total of 163 perch were captured on two separate days in August of which 103 were measured and ranged in length from 48-205mm. Thirty-four of these were aged by the scale method which indicated there were 19 YOY(56%), 5 age 1+(15%) and 10 age 2+(29%). It is not known whether these perch were part of the general Lake Michigan population or a local population inhabiting Moonlight Bay, Reibolt's Creek and Mud Lake (an inland lake 0.5 miles upstream from the mouth of Reibolt's Creek).

The only other assessment information comes from the National Biological Service (NBS). They did not collect any YOY perch in their trawls at Manistique, which has been the case for the past 4 years as well.

Green Bay

The Wisconsin DNR has conducted trawl assessments in the bay since 1978 at standard index sites and at deep index sites which were added in 1988. The deeper sites were developed in response to a trend in increasing abundance at a single deep site established in 1985 off Marinette. The standard and deep site assessment data have been combined based upon the quantity of habitat they represent, and a weighted average value is now used which includes an adjustment for standard site data prior to 1988 to account for the increasing area occupied by perch. The capture rate of YOY perch in 1994 was the fourth lowest since the assessments began (Figure 1). Three consecutive relatively weak year classes appear to have occurred from 1992-94 in Wisconsin waters of the bay. A declining trend in the relative abundance of yearling and older perch captured in the trawls has also become apparent since 1988, with the exception of 1992 (Figure 2). Last year (1994) also marked the second consecutive time that the average trawl catch of yearling and older perch was lower at deep sites (493/hr) than at standard sites (637/hr).

Wisconsin also reported that shoreline seining conducted at Little Tail Point in Southern Green Bay (see Figure 3b) produced high numbers of YOY perch which did not appear in the August trawl catches. Wisconsin sport and commercial harvest data for 1994 also indicated that the relatively strong 1991 year class predominated by number (63%).

The Michigan DNR has employed both trawls and gill nets to assess perch stocks in Little Bay de Noc (LBDN) and Big Bay de Noc (BBDN). In LBDN trawl catch rates of perch less than 3.5" (90mm) were much lower in 1994 (-85%) than in 1993 (Table 1). Although the 1993 catch rate of 64.1/haul was the highest observed since 1988, the 1994 rate of 9.7/haul was also 61% lower than the mean catch rate of 24.9/haul for the 1988-94 period. The mean catch rate of 17.5/lift for all perch in the 1994 LBDN gill net assessments was 67% higher than in 1993 (10.5/lift), and also 33% higher than the mean of 13.2/haul for the 1988-94 period. Although relatively weak year classes appear to have been produced in LBDN in 1992 and 1994, no trend in the relative abundance of YOY perch is apparent.

Trawl catch rates in BBDN for perch less than 3.5" have increased dramatically since 1992, while gill net catches have declined by 57% during the same period. The 1994 trawl catch rate of 141.7/haul was 106% higher than the mean rate of 68.8/haul from 1988 through 1994, and the 1994 gill net catch rate of 5.8/lift was 44% lower than the mean rate of 10.4/lift for the same period.

Recoveries from the tagging of 19,572 perch (virtually all tagged at the head of LBDN during spawning concentrations) between 1989 and 1993 have continued to indicate there may be little movement from LBDN to BBDN. Although a small percentage of the tagged perch were recovered as far as 14 miles from the tagging site, the vast majority were caught within 4 miles from where they were tagged.

Although some experimental shallow water trawling and shoreline seining was conducted by the Wisconsin DNR north of Sturgeon Bay along the Green Bay shore of Door County in 1994, no concentrations of juvenile perch were found. On-going tagging studies by the Wisconsin DNR in Green Bay (1608 tagged since 1992) and along the Door County shoreline in Lake Michigan (1542 tagged since 1992) continue to indicate there may be little or no movement of perch between the bay and the lake in this area. However, perch tagged on the lake side since 1992 at Bailey's Harbor (641) and Sturgeon Bay (901) since 1993 have been recovered as far south as Waukegan, IL and Michigan City, IN (Figures 3a-c).

Central Lake Michigan

Assessment data is scant from the central region of the lake. The NBS did not collect any YOY perch at their Frankfort and Ludington trawling index stations. However, this has essentially been the case at their 7 lakewide long term sampling stations for the past 4 years.

WISCONSIN DNR - GREEN BAY

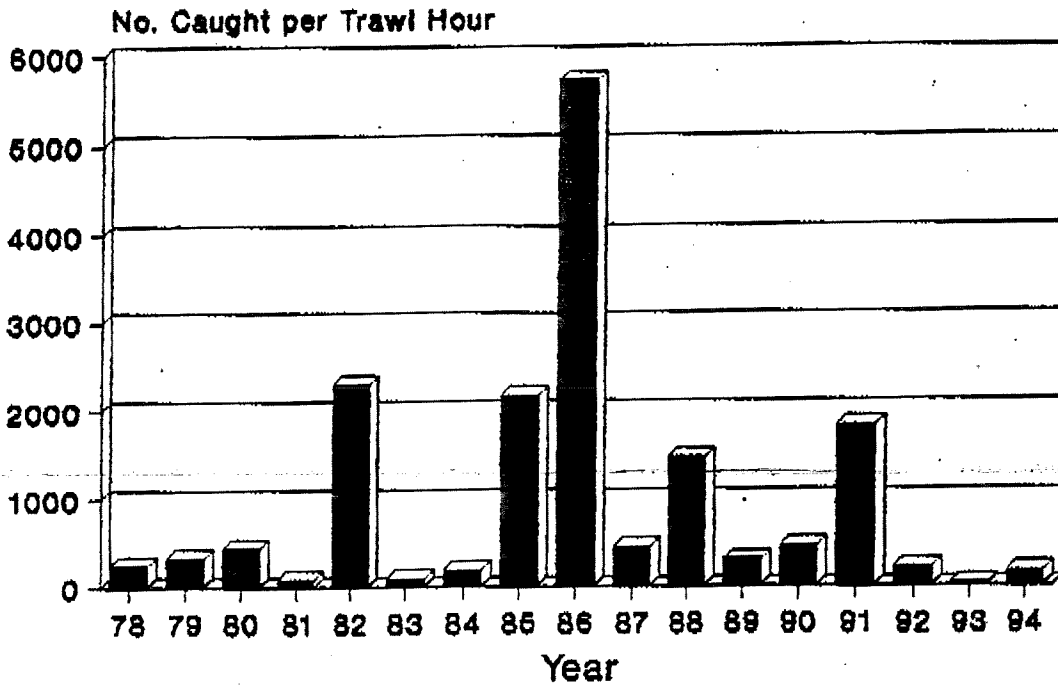


FIGURE 1. INDEX TRAWL REL. ABUNDANCE
YOY YELLOW PERCH WEIGHTED AREA AVG.

WISCONSIN DNR - GREEN BAY

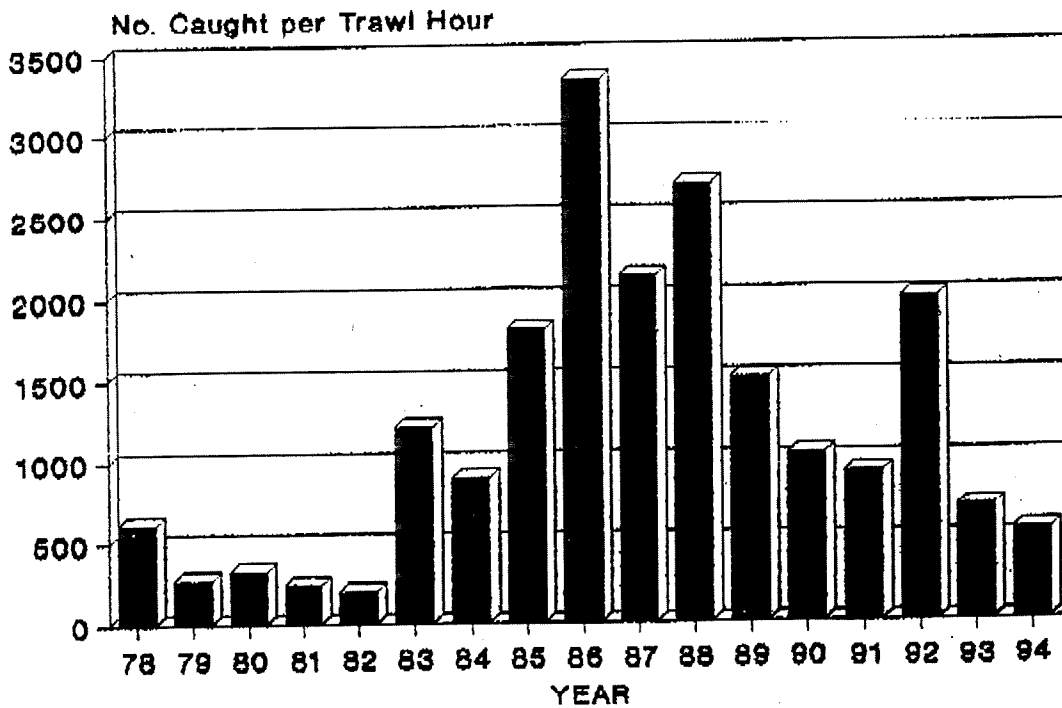


FIGURE 2. INDEX TRAWL REL. ABUNDANCE
YLG. & OLDER Y. PERCH WEIGHTED AREA AVG.

MICHIGAN DNR - BAYS DE NOC

Table 1.--Catch-per-unit-effort for yellow perch in 10-min trawl hauls and 24-hr, 60-ft experimental gill net sets.

Bay	Year	Number of fish per trawl haul			Number of fish per gill-net lift		
		Fish <3.5"	Fish ≥3.5"	All fish	Fish <7"	Fish ≥7"	All fish
Little Bay de Noc	1988	35.3	43.1	71.8	15.1	4.8	16.8
	1989	17.7	10.7	21.3	11.0	2.7	12.5
	1990	10.3	18.0	24.0	9.4	1.8	9.8
	1991	33.1	11.3	36.7	6.4	4.3	9.6
	1992	4.3	11.0	13.2	12.6	5.9	16.1
	1993	64.1	17.6	67.1	9.9	1.8	10.5
	1994	9.7	3.2	12.9	14.4	3.2	17.5
Big Bay de Noc	1988	34.7	34.0	51.5	3.0	3.0	5.0
	1989	3.5	3.7	3.6	14.9	7.1	20.2
	1990	70.3	12.0	70.4	6.6	4.2	9.7
	1991	205.0	1.5	205.2	8.4	3.8	9.4
	1992	2.9	2.8	3.8	11.6	3.6	13.6
	1993	23.4	1.7	24.0	9.4	2.0	9.5
	1994	141.7	8.5	150.2	3.9	1.9	5.8

WISCONSIN DNR - MILWAUKEE

Age	Year									
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1	0	0	0	0	0	0	0	0	0	0
2	343	269	464	626	724	177	48	59	0	0
3	2662	526	453	1854	1037	961	276	98	26	0
4	368	3580	386	1012	938	359	715	559	60	27
5	134	541	701	1563	394	363	281	1282	219	67
6	236	71	324	1880	381	92	181	299	140	121
7	13	72	12	155	90	92	126	93	48	76
8	1	3	3	1	0	36	88	29	12	65

Table 2. CPE (fish/1000 feet/night) of age 8 and younger yellow perch, by age, in standardized graded mesh gill net assessments completed in January of each year from 1986 through 1994.

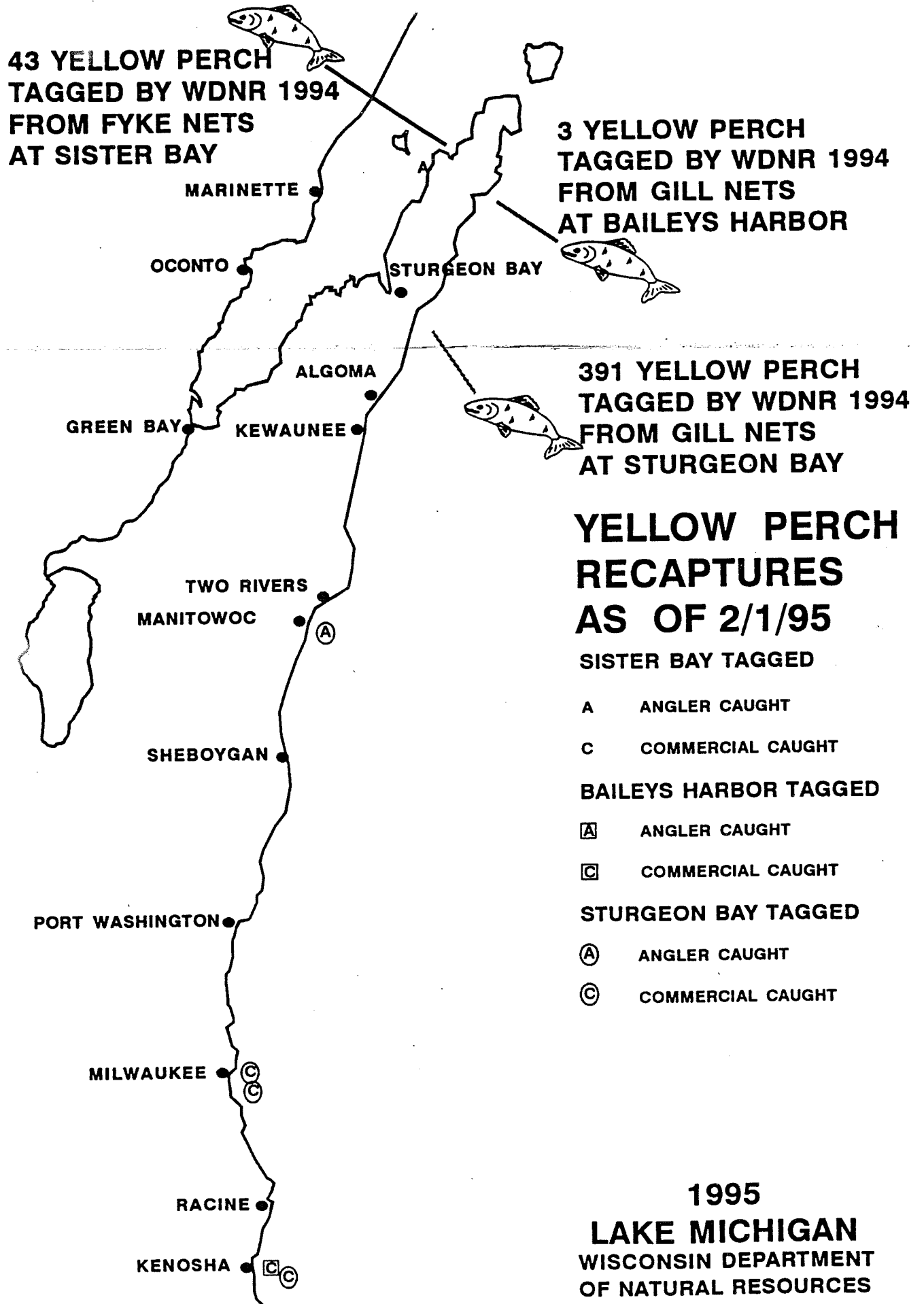


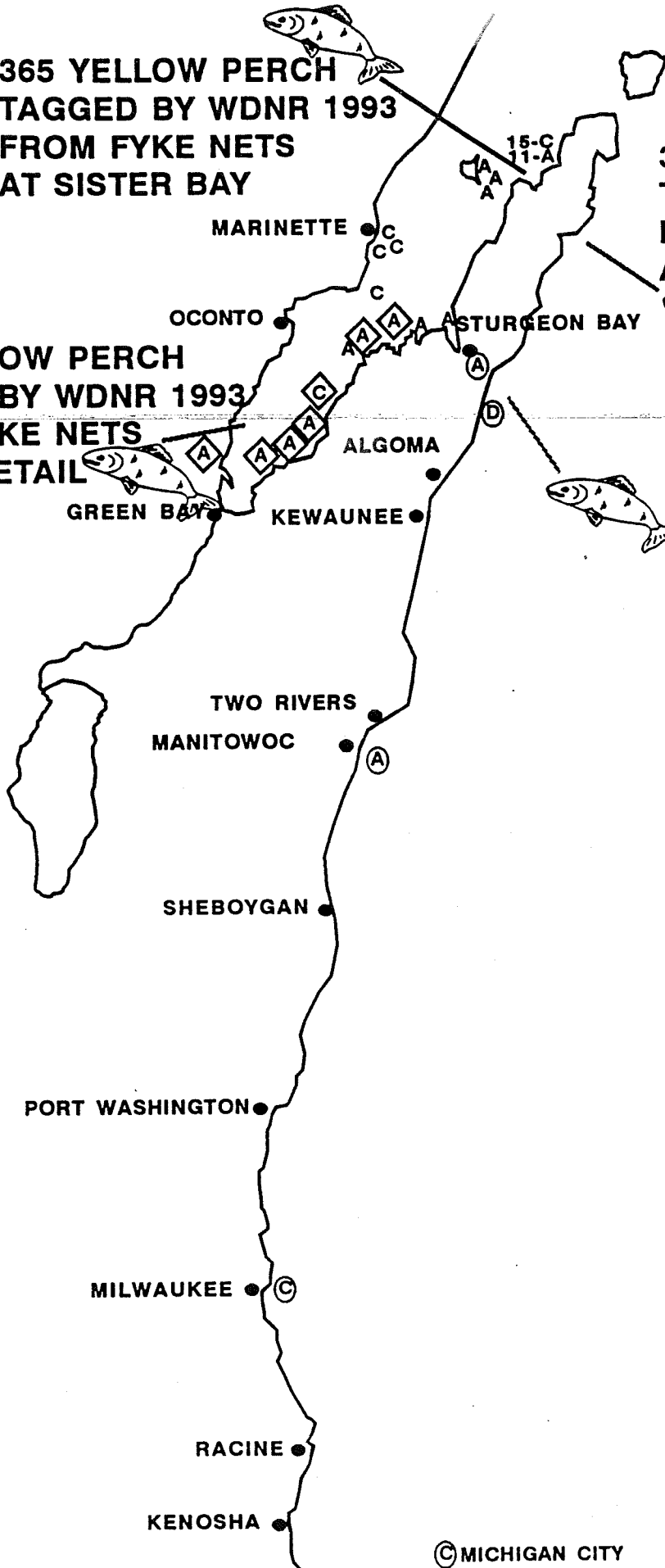
FIGURE 3b

365 YELLOW PERCH
TAGGED BY WDNR 1993
FROM FYKE NETS
AT SISTER BAY

331 YELLOW PERCH
TAGGED BY WDNR 1993
FROM GILL & FYKE NETS
AT BAILEYS HARBOR

603 YELLOW PERCH
TAGGED BY WDNR 1993
FROM FYKE NETS
AT LITTLETAIL

510 YELLOW PERCH
TAGGED BY WDNR 1993
FROM GILL AND DROP
NETS AT STURGEON BAY



YELLOW PERCH RECAPTURES AS OF 2/1/95

SISTER BAY TAGGED

- A ANGLER CAUGHT
- C COMMERCIAL CAUGHT

BAILEYS HARBOR TAGGED

- ◻ ANGLER CAUGHT
- ◻ COMMERCIAL CAUGHT

STURGEON BAY TAGGED

- Ⓐ ANGLER CAUGHT
- Ⓒ COMMERCIAL CAUGHT
- Ⓓ DNR SURVEY

LITTLETAIL POINT TAGGED

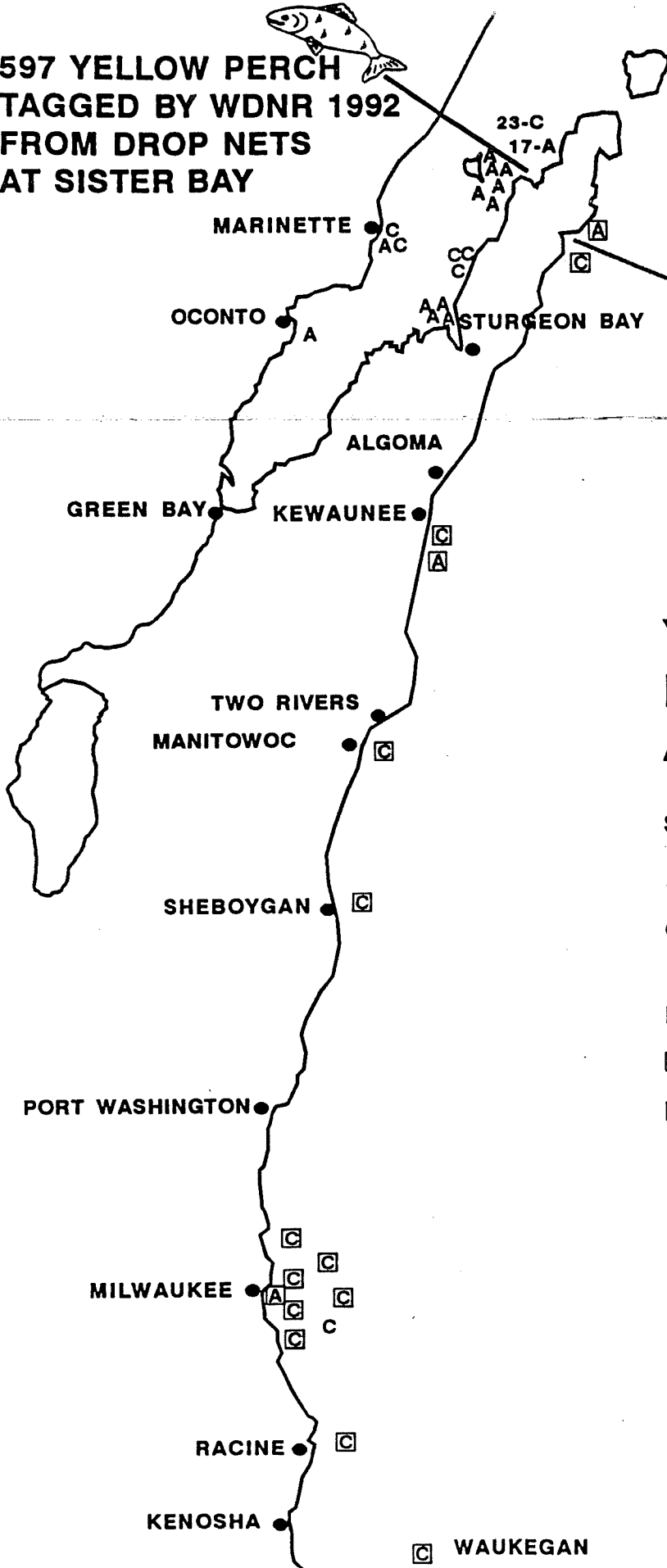
- ◊ ANGLER CAUGHT
- ◊ COMMERCIAL CAUGHT

1995

LAKE MICHIGAN
WISCONSIN DEPARTMENT
OF NATURAL RESOURCES

597 YELLOW PERCH
TAGGED BY WDNR 1992
FROM DROP NETS
AT SISTER BAY

307 YELLOW PERCH
TAGGED BY WDNR 1992
FROM DROP NETS
AT BAILEYS HARBOR



YELLOW PERCH RECAPTURES AS OF 2/1/95

SISTER BAY TAGGED

- A ANGLER CAUGHT
- C COMMERCIAL CAUGHT

BAILEYS HARBOR TAGGED

- A ANGLER CAUGHT
- C COMMERCIAL CAUGHT

1995
LAKE MICHIGAN
WISCONSIN DEPARTMENT
OF NATURAL RESOURCES

C WAUKEGAN

Southern Lake Michigan

The decline in relative abundance of age 3 and older perch continued in 1994 as evidenced by the gill net assessment catches in Wisconsin (Table 2), Illinois (Figure 4) and Indiana (Figure 5). Following a decline of 64% between 1993 and 1994 in Wisconsin, the catch declined another 30% between 1994 and 1995. Illinois catches declined by 60% and 35% between 1992-93 and 1993-94, respectively, and similarly, Indiana catches declined by 60% from 1992-93 and by 50% from 1993-94. The most recent relatively strong year class (1988) predominated in the 1994 Illinois assessment and has increased the mean age in the Illinois catch from 4.4 years in 1992 to 6.4 years in 1994. This same year class also predominated in the 1995 Wisconsin assessment catch which was conducted in January (Table 2).

Captures of YOY perch in the annual beach seine assessment in Illinois waters remained extremely low in 1994, marking the fifth consecutive year of very poor catches (Figure 6). And, similarly once again, Indiana's trawl catches of YOY perch remained very low for the third consecutive year (Figure 7).

The general trend in increasing growth rates evidenced in Illinois (Figures 8a-b) and Indiana (Figure 9B) waters since 1989 continued into 1994. This increase in growth followed a decline which persisted throughout the 1980s, a period when perch abundance increased dramatically. The recent trend in increasing growth rates is likely a density-dependent response to the dramatic declines in abundance observed in this portion of the lake.

Yellow Perch Task Group Progress Report

The need for a yellow perch task group (YPTG) was expressed at the LMTC meeting in February, 1994 in response to a lack of recruitment (a series of weak year classes) from 1990-93 in the southern portion of the lake. The formation of the YPTG was approved by the LMC in March, 1994 and the YPTG was given three initial charges:

1. Consolidate the available data on yellow perch and assess its compatibility.
2. From the consolidation of the data, evaluate what can be said about the discreteness of stocks in the lake; if there is not a definitive statement about stock discreteness, develop a study plan to address the question.
3. Report progress to the LMTC at the winter meeting in 1995.

The following individuals have participated in the initial activities of the YPTG which has thus far held one meeting on June 7, 1994 at Michigan City, IN:

Rich Hess, IDOC (Chairman)	Jim Francis, IDNR	Phil Schneeberger, MDNR
Ellen Marsden, INHS	Cliff Kraft, WI-SG	Steve Schroyer, Ball State Univ.
Tom McComish, Ball State	Fred Binkowski, U-WI	Brian Belonger, WDNR
Mike Keniry, WDNR	Dave Jude, U-MI	Mark Holey, USFWS
Steve Robillard, INHS	Wayne Brofka, INHS	

To date, the following tasks have been pursued and are at varying stages of completion:

A comprehensive listing of past and current assessment and research activities has been compiled for purposes of assessing data compatibility lakewide. The list has twice been reviewed by contributors and should require one final review for accuracy and completeness. Preliminary data compatibility concerns include the use of different sampling gear, variation in sampling periods for assessment purposes, variability of specific data collected, and use of different methods for age determination.

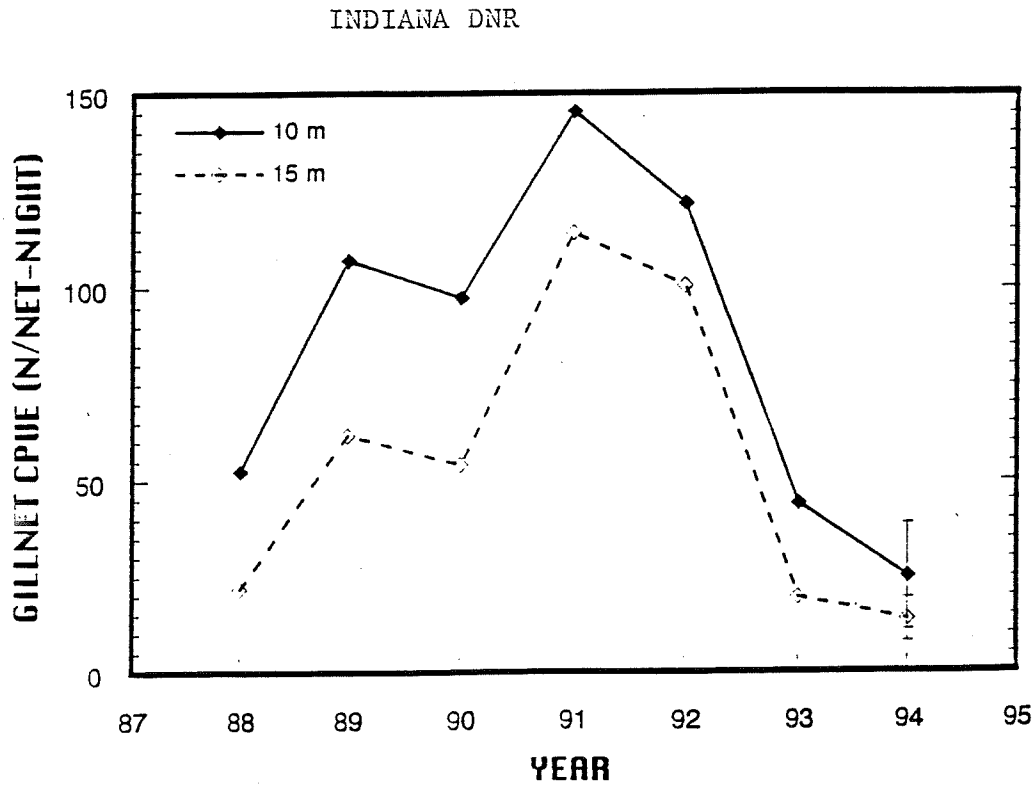
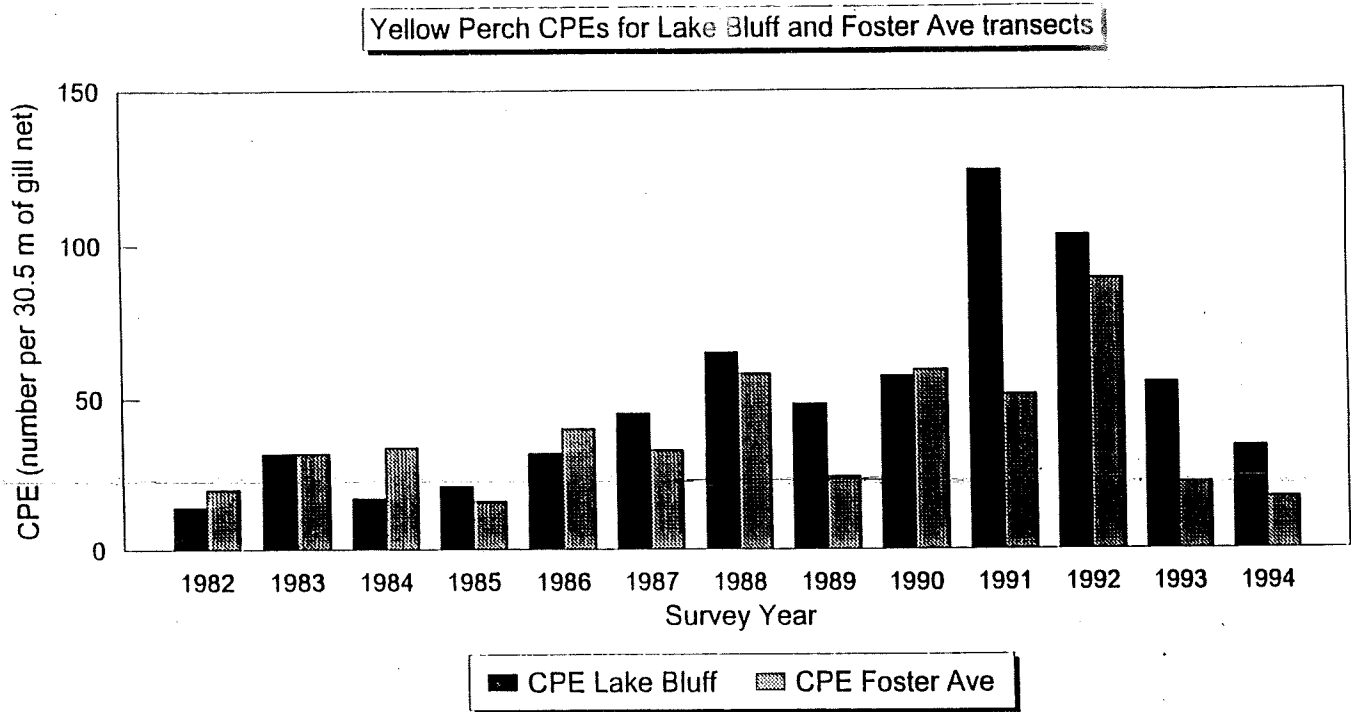


Figure 5. Gillnet CPUE (n per net-night) of yellow perch at pooled sites M and K in Indiana waters of Lake Michigan at 10 m and 15 m depths, 1988-94. Error bars represent $\pm 2SE$.

FIGURE 6

ILLINOIS DOC - BEACH SEINING ASSESSMENTS

Yellow Perch: Young-of-the-Year

Indices of Relative Abundance

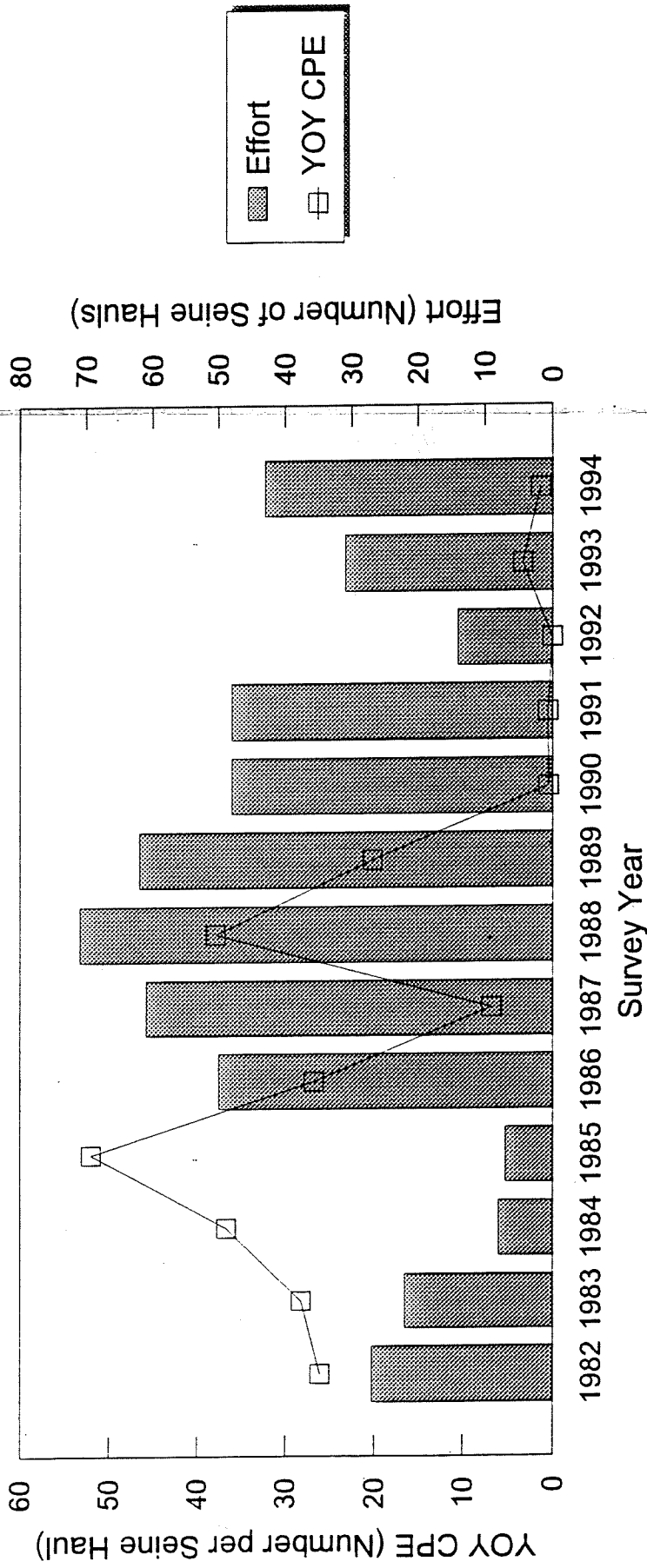
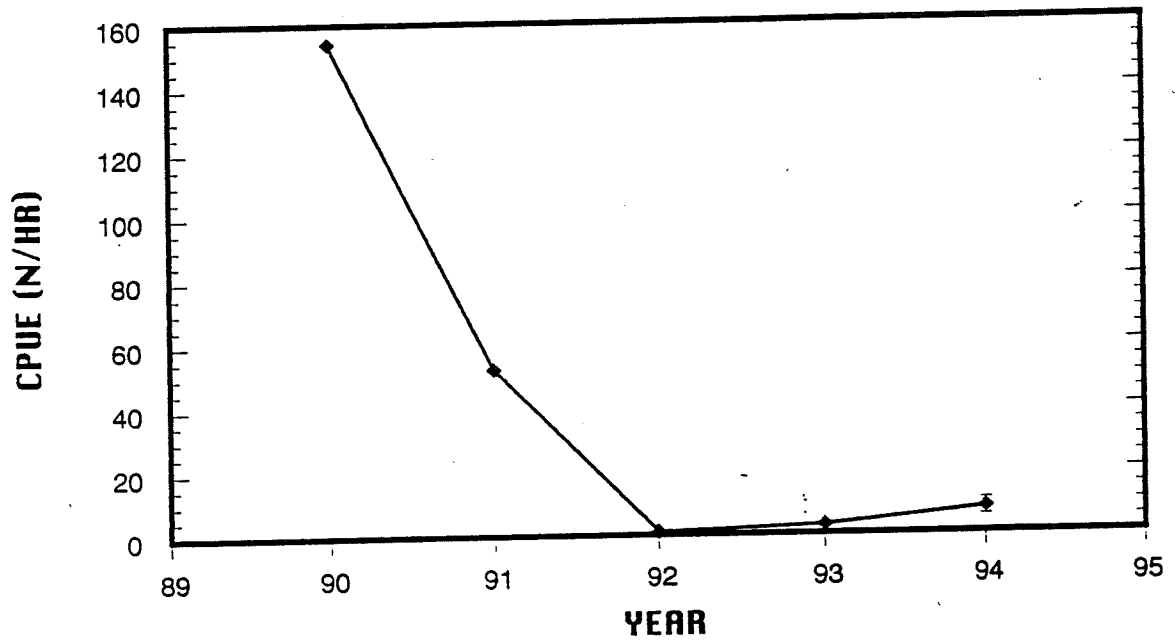
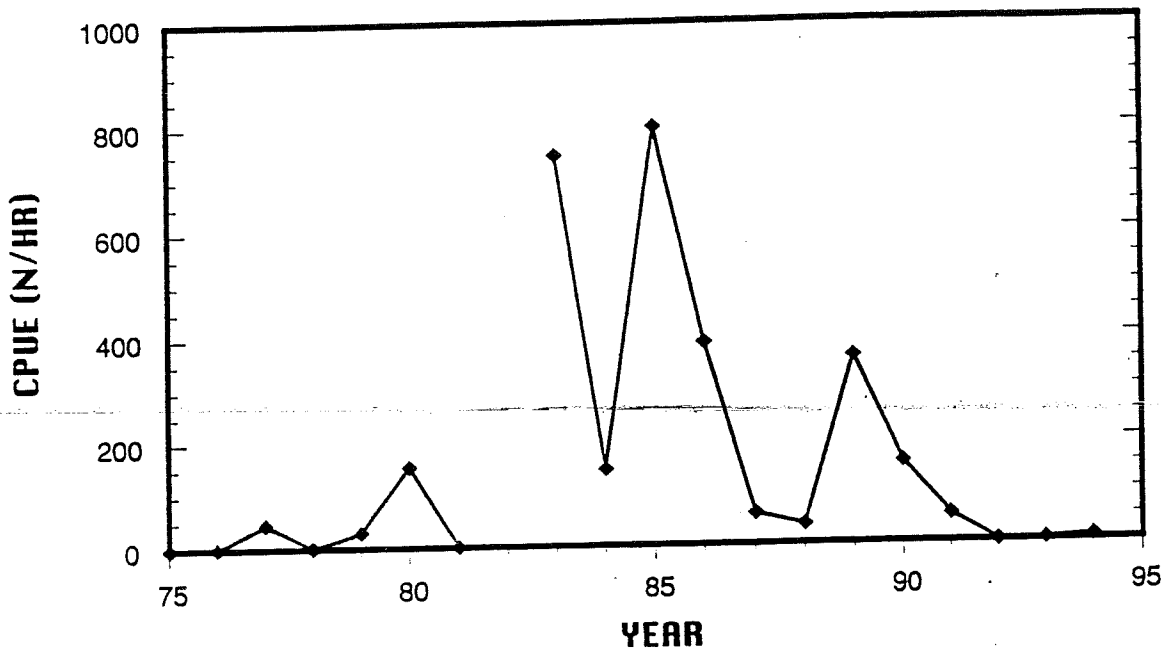


FIGURE 7

INDIANA DNR - TRAWL ASSESSMENTS (YOY)



Trawl catch-per-unit-effort (CPUE) of young-of-the-year yellow perch for pooled June through August sampling periods at sites M and K in Indiana waters of Lake Michigan. Error bars represent $\pm 2SE$.

ILLINOIS DOC - CHICAGO AND LAKE BLUFF STATIONS

FIGURE 8a

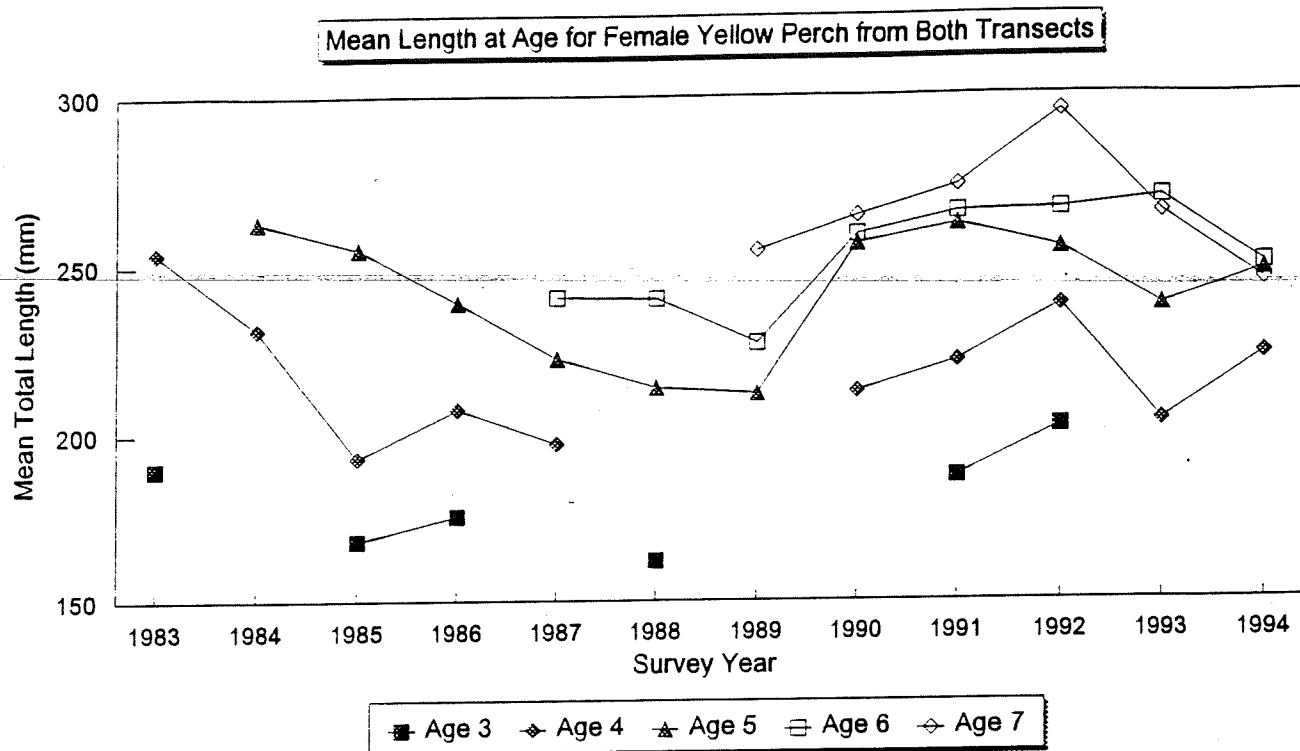
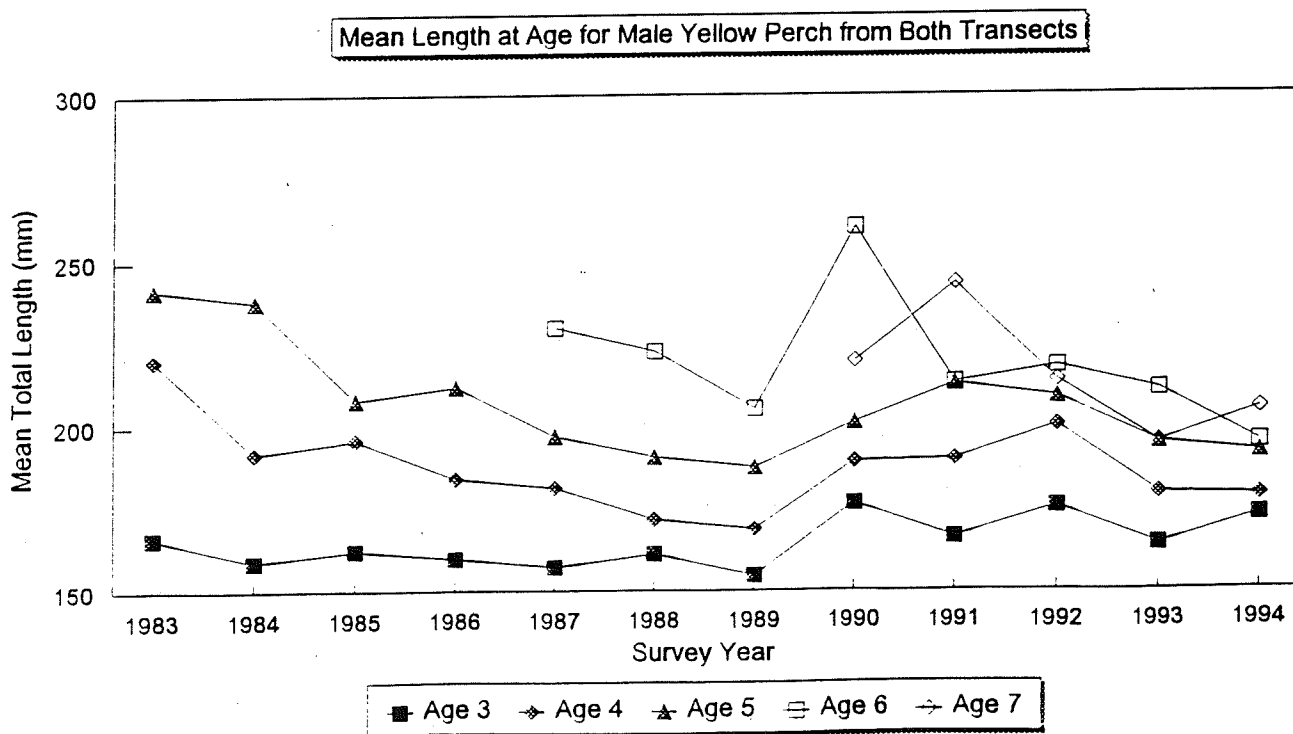
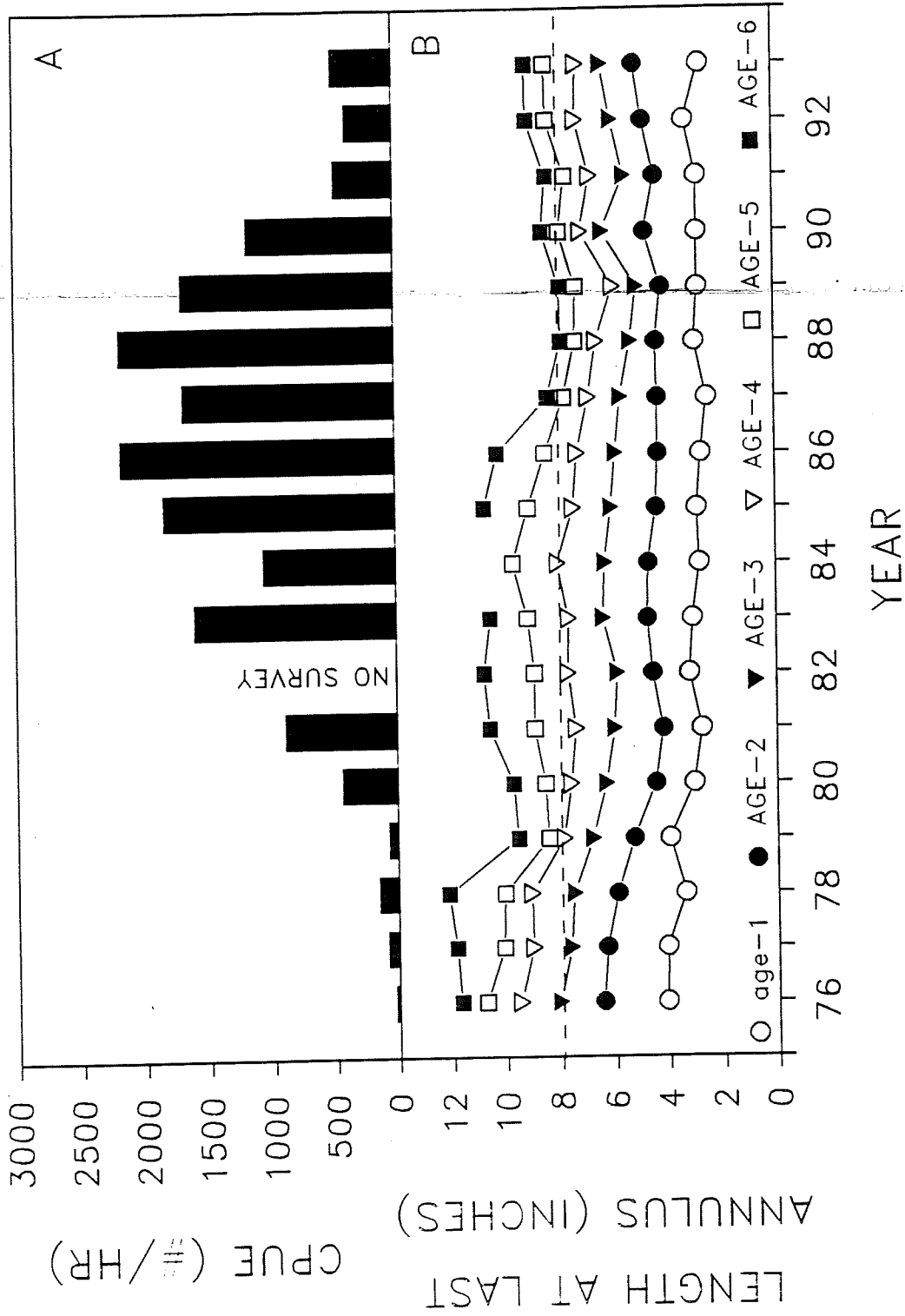


FIGURE 8b



INDIANA DNR

FIGURE 9



A) Yellow perch catch-per-unit-effort (CPUE) from trawl catches of age-1 and older fish from Indiana waters of Lake Michigan. B) Backcalculated length at last annulus of yellow perch from Indiana's waters of Lake Michigan. (Mc Comish et al. 1994)

Although we are not yet in a position to make a definitive statement about discrete stocks based upon an evaluation of consolidated lakewide data, there is at least some evidence from tagging studies in Lake Michigan (Wisconsin DNR-ongoing; Marsden, et. al., 1993, Yellow Perch Supply and Life History, IL Natural History Survey) that separate stocks may exist. In addition, new studies currently being conducted by the IL Natural History Survey include the analysis of perch from widely separated geographic areas in the lake utilizing three recognized techniques to identify potential genetic markers which would permit stock differentiation.

The YPTG chairman provided a progress report to the LMTC at their winter meeting in Chicago, IL in January, 1995.

In addition to the above activities related to the charges given to the YPTG, both members of the YPTG and the LMTC contributed to and participated in the Lake Michigan Perch Conference held in Kenosha, WI on December 10, 1994. This conference was organized by the Great Lakes Sport Fishing Council and was convened for the purpose of transferring information on the perch recruitment problem from the Lake Michigan management agencies to the constituents from all four states. Following the presentations by managers and researchers the constituents were divided into several discussion groups to identify and evaluate the options available to address the perch decline. A total of 152 non-agency people attended the conference representing 47 sport fishing organizations and 21 commercial companies. The results of this successful endeavor led to a collaborative plan put together by the Lake Michigan Fish Chiefs to significantly reduce both sport and commercial harvests in a uniform fashion. Rule changes to implement the new harvest regulations in the central and southern portions of Lake Michigan are currently being pursued in each of the four states. These reductions are intended to extend perch harvest opportunities and protect broodstock over time. Additionally, both law enforcement and yellow perch research will be expanded (the YPTG has been asked by the Fish Chiefs to develop a multi-agency initiative to identify the likely causes for the lack of perch recruitment).

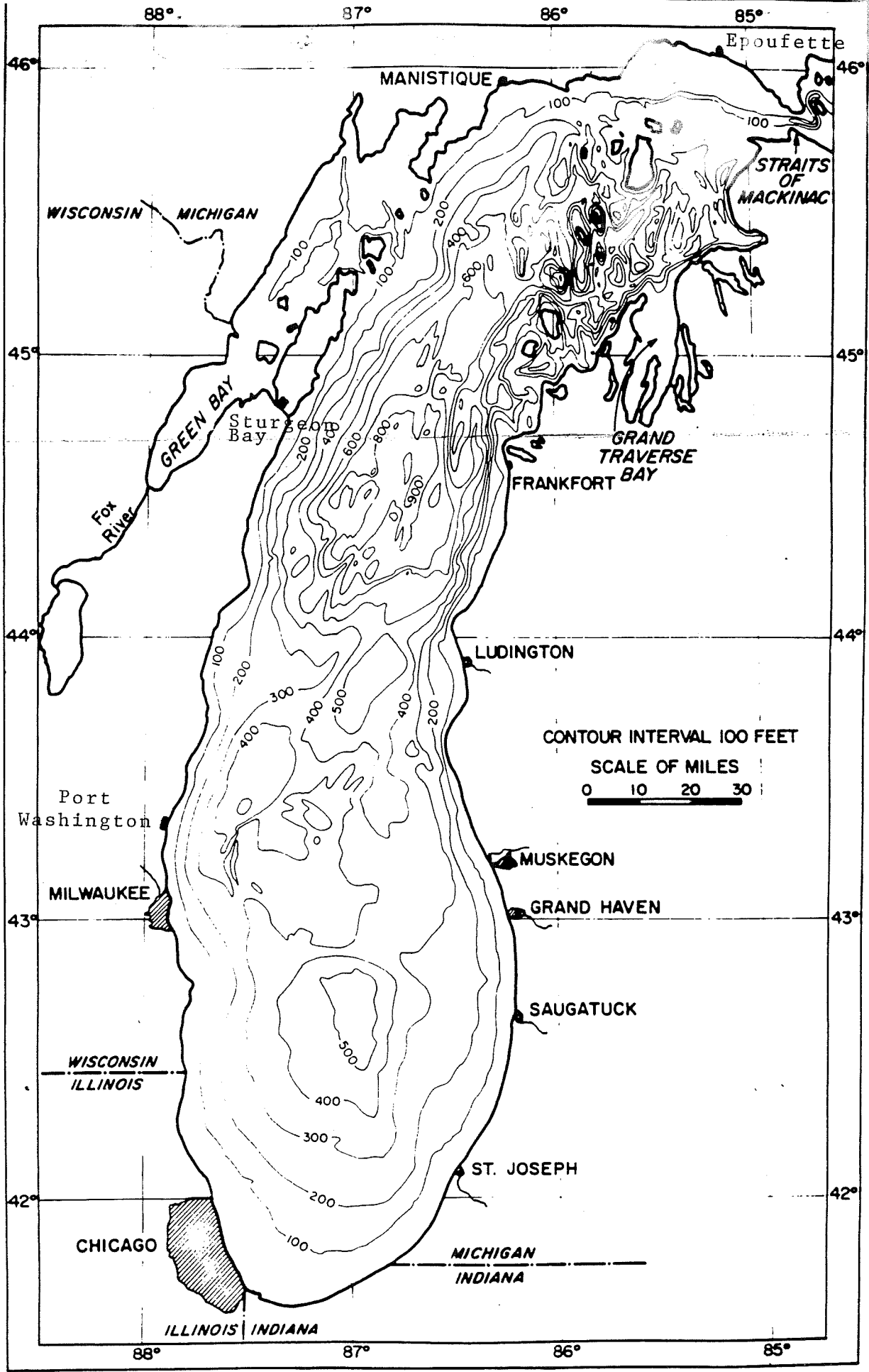


Figure 1. Lake Michigan (modified from Hough 1958). Grand Traverse Bay, which is not contoured, has a steeply sloping bottom and a maximum depth of about 600 feet.

