

## STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-8

Study No.: 230466

Title: Fish community status in Saginaw Bay,  
Lake Huron.

Period Covered: October 1, 2006 to September 30, 2007

**Study Objective:** To assess responses of the Saginaw Bay fish community to changing environmental and biological conditions. Of special interest is to monitor the response of the fish community to management actions and nonnative species.

**Summary:** Reproductive success of percids was again strong in 2007. Walleye reproductive success was improved compared to 2006. Since 2003, survival has been lower for age-0 yellow perch and walleyes, but strong year classes are still being produced for walleyes. All field work was completed on schedule and laboratory and data analysis is proceeding on schedule.

**Findings:** Jobs 1 through 4 were scheduled for 2006-07, and progress is reported below.

**Job 1. Title: Relative abundance and community structure.**—Survey work was completed on schedule in 2007 with 16 gill-net sets and 33 trawl tows performed (Tables 1 and 2).

**Job 2. Title: Process and analyze survey data.**—Sample processing and laboratory analysis including assignment of ages based on boney part collections is complete for the 2006 specimens and is under way for those collected in 2007.

Reproductive success of yellow perch in 2006 continues to decline from the record peak in 2003 but overall remains relatively strong (Table 3). Mean total length of age-0 yellow perch has increased. If larger size improves survival the 2006 year class may achieve more recruitment than some recent year classes.

Reproductive success of walleye increased in 2007, compared to 2006, to a mean catch-per-unit-of-effort (CPUE) of 12.4 age-0 walleyes per 10-minute trawl tow (Table 4). This was the fourth highest trawl CPUE for age-0 walleye observed from 1986-2007. The CPUE in 2006 (1.20) was 10 times lower. Walleye were not stocked in either 2006 or 2007. Stocking was halted for these years in response to improved ecological conditions favoring strong walleye reproductive success, specifically the absence of alewives which prey on and compete with newly hatched walleye fry. Walleye reproductive success on the whole remains strong in Saginaw Bay as shown by the upward trend in trawl CPUE since 2003. The return to relatively high CPUE in 2007 indicates that the 2006 value was not a return to the previous status quo of pre 2003 rates. Actual year class strength as indicated by CPUE of yearling walleyes in the gill nets indicates that survival of age-0 walleyes since 2003 has not been as high as in previous years (Figure 1). However, strong year classes are still resulting, and the 2005 year class is a new record for this time series.

**Job 3. Title: Determine year class composition.**—All age-0 walleyes in 2006 and 2007 are naturally reproduced fish as no stocking took place those years. Marking and analysis of oxytetracycline will resume if and when stocking resumes. Currently managers are revisiting the stocking

decision annually in accordance with the Saginaw Bay Walleye Recovery Plan (Fielder and Baker 2004).

**Job 4. Title: Prepare annual, final, and other reports.**—This performance report summarizes data from 2006 and some from 2007, and fulfills the requirements of Job 4.

**Literature Cited:**

Fielder, D. G., and J. P. Baker. 2004. Strategy and options for completing the recovery of walleye in Saginaw Bay. Michigan Department of Natural Resources, Fisheries Special Report 29, Ann Arbor.

Fielder, D. B., J. E. Johnson, J. R. Weber, M. V. Thomas, and R. C. Haas. 2000. Fish population survey of Saginaw Bay, Lake Huron, 1989-97. Michigan Department of Natural Resources, Fisheries Research Report 2052, Ann Arbor.

Haas, R. C., and J. S. Schaefer. 1992. Predator-prey and competitive interactions among walleye, yellow perch, and other forage fishes in Saginaw Bay, Lake Huron. Michigan Department of Natural Resources, Fisheries Research Report 1984, Ann Arbor.

**Prepared by:** David Fielder and Mike Thomas

**Date:** September 30, 2007

Table 1.—Number of fall gill-net sets (by location) for Saginaw Bay, Lake Huron, 1994–2007.

Station	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pt. Lookout	1	4	3	1	1	1	1	1	1	1	1	–	–	–
Au Gres River	1	1	1	1	1	1	1	1	1	1	1	–	–	–
Pt. Au Gres	2	6	6	2	2	2	2	2	2	2	2	2	2	2
Black Hole	2	6	5	2	2	2	2	2	2	2	2	2	2	2
Coreyon Reef	2	3	2	2	2	2	2	2	2	2	2	2	2	2
Fish Pt.	2	3	5	2	2	2	2	2	2	2	2	2	2	2
North Island	1	6	5	2	2	2	2	2	2	2	2	2	2	2
Oak Pt.	1	6	5	2	2	2	2	2	2	2	2	2	2	2
Charity Is.	–	3	2	2	2	2	2	2	2	2	2	2	2	2
Tawas	–	2	2	2	2	2	2	2	2	2	2	2	2	2
Total	12	40	36	18	18	18	18	18	18	18	18	16	16	16

Table 2.—Location of trawl stations and number of tows performed in Saginaw Bay, 1993–2007. All sampling was conducted in fall except where indicated otherwise.

Quadrant	Site description	1993	1994	1995 <sup>a</sup>	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
East	North Island and Wildfowl Bay	5	6	6	6	6	6	3	6	3	10	4	9	6	6	6
South	Coreyon Reef	5	3	9	6	7	6	6	6	3	7	9	9	3	3	9
West	Pinconning	13	13	9	12	9	9	9	9	9	10	7	9	6	12	9
North	Au Gres	15	10	15	6	9	6	9	9	12	10	10	9	12	9	9
Total		38	32	39	30	31	27	27	30	27	37	30	36	27	30	33

<sup>a</sup> Total for north quadrant includes six experimental trawls near Charity Islands

Table 3.–Number of young-of-the-year yellow perch caught per ten-minute tow (CPUE) from Saginaw Bay, Lake Huron and their mean total length, fall 1970–2007<sup>a</sup>.

Year	CPUE	Mean total length (mm)
1970	29.5	96.5
1971	20.2	91.4
1972	13.9	83.8
1973	30.6	91.4
1974	27.9	88.9
1975	247.9	88.9
1976	11.1	91.4
1977	52.9	91.4
1978	99.8	86.4
1979	166.7	78.7
1980	39.0	86.4
1981	71.3	83.8
1982	686.7	76.2
1983	251.9	76.2
1984	171.0	78.7
1985	147.8	78.7
1986	71.4	73.7
1987	131.5	81.3
1988	56.6	76.2
1989	252.8	71.1
1990	39.0	79.5
1991	110.8	70.2
1992	7.1	76.2
1993	0.5	90.7
1994	3.9	85.0
1995	98.9	72.8
1996	37.3	81.9
1997	83.3	73.8
1998	74.4	76.1
1999	19.5	92.4
2000	9.4	83.2
2001	133.9	77.1
2002	36.7	76.2
2003	2,450.7	69.7
2004	461.8	66.1
2005	233.6	79.0
2006	50.0	72.8

<sup>a</sup> Data prior to 1990 from Haas and Schaeffer (1992). Data from 1990 to 1997 from Fielder et al. (2000).

Table 4.—Number of age-0 walleyes caught, and age-0 walleye catch rate (expressed as mean catch per 10-minute tow) and mean length of age-0 walleye for fall trawls on Saginaw Bay from 1986 to 2007.

Year	Number of age-0 walleyes captured	Age-0 walleye catch rate	Mean length (mm)
1986	20	0.43	
1987	34	0.46	
1988	39	0.59	
1989	19	1.27	
1990	0	0.00	
1991	28	1.89	
1992	6	0.16	
1993	1	0.02	
1994	22	0.64	
1995	14	0.36	
1996	0	0.00	
1997	83	2.18	
1998	149	8.55	212
1999	20	0.74	198
2000	5	0.30	180
2001	27	0.98	
2002	84	2.54	176
2003	1,114	40.80	171
2004	822	22.93	117
2005	825	31.30	119
2006	32	1.20	162
2007	409	12.40	Not yet available

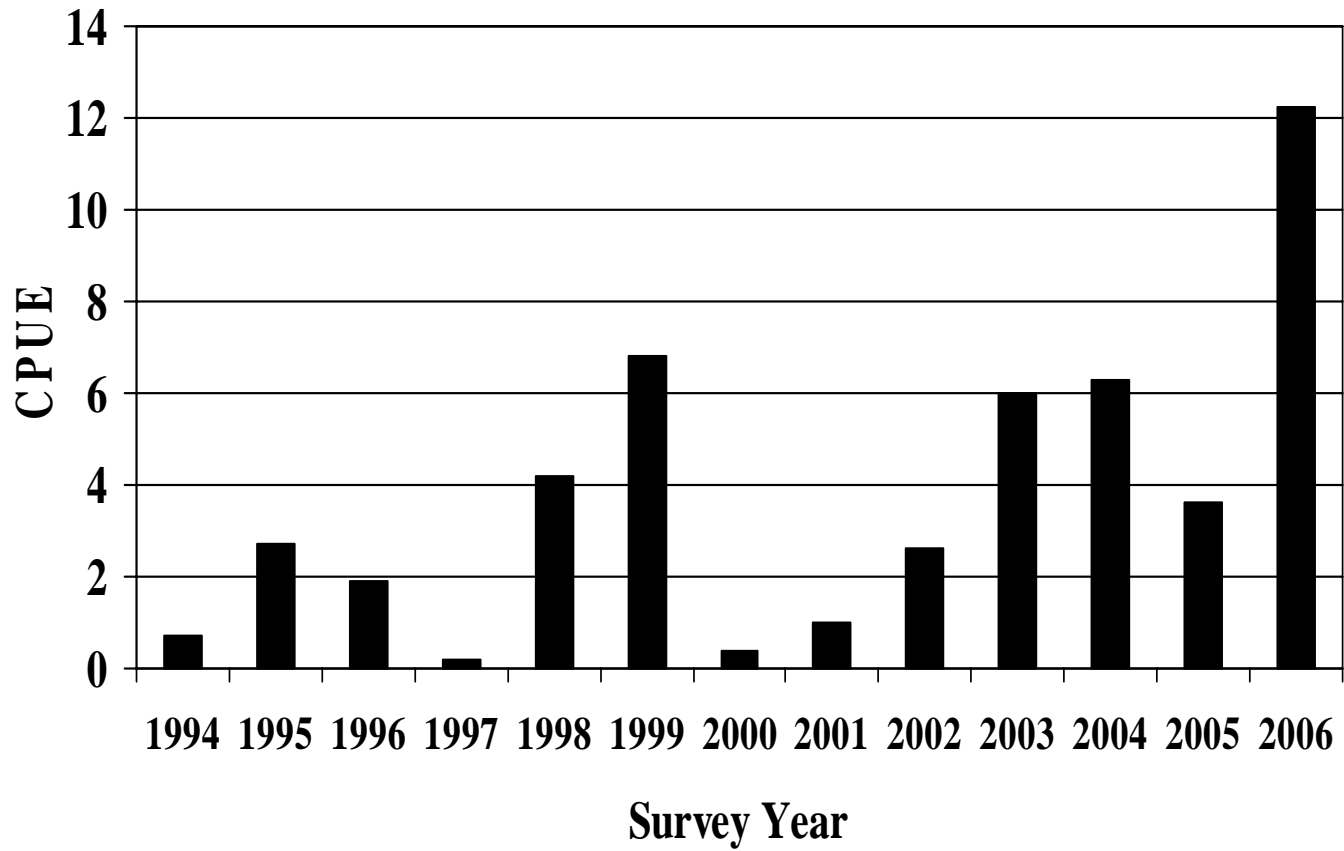


Figure 1.—Catch-per-unit-of-effort (CPUE as number per 305m of gill net) for age-1 walleyes caught in gill nets in Saginaw Bay 1994–2006, as a measure of walleye recruitment.