

PLEASANT LAKE

St. Joseph County (T6S, R12W, Sections 9, 10, 15, 16)

Surveyed May 7-10 and May 29, 1996

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Environment

Pleasant Lake is located in Fabius Township, west central St. Joseph County. It is locally known as simply Pleasant. It is 4 miles west of the town of Three Rivers. The area surrounding the lake consists of a mosaic of farmland and woodlots. The topography is mostly small undulating hills. Well-drained loamy and sandy soils in glacial outwash plains and moraines encompass the entire watershed. Soil classification associations include Oshtemo – Spinks and Hillsdale – Riddles (Cowan 1983).

Pleasant Lake is a 262-acre natural lake (Figure 1). The maximum depth is 53 feet (Fusilier and Fusilier 1992). The lake was mapped by the State in 1949. It has two distinct basins that combined have a mean depth of 19 feet and a flushing rate of 3.9 years. The watershed of the lake is small (1,040 acres). Pleasant Lake is in the St. Joseph River Watershed. In 1967 the Circuit Court of St. Joseph County set the lake level of Pleasant Lake at 851 feet above sea level. The only outlet flows from the southeast corner of the lake to Little Pleasant Lake.

Limnological parameters have been measured at least five times since 1948. The latest complete results were collected September 1, 1994. The water had a slight green tint. A Secchi-disc reading was 15 feet. Alkalinities ranged from 125 ppm at the surface to 164 ppm at 49 feet; these values represent good buffering capacity. Surface pH was 8.7. Water temperatures ranged from 73°F at the surface to 51°F at 52 feet. A thermocline was present from 23 to 28 feet. Dissolved oxygen levels declined below 4.0 ppm at 24 feet to less

than 1.0 ppm at 26 feet, effectively prohibiting fish from surviving below that depth.

Previous limnological measurements were conducted in July and August. Secchi-disc readings have ranged from 6 feet (August 1978) to 20 feet (June 1992). Dissolved oxygen and alkalinity readings since 1948 are consistent with the 1994 sample. This could indicate that there has been little change in overall water quality.

The shoal areas of the lake are not highly vegetated. Submerged, floating, and emergent vegetation was rated as sparse to abundant throughout various locations of the lake. Some milfoil (species unidentified) was noted. There is good structure for game fish species, in the form of bars, flats, drop offs and points (Figure 1).

Development around Pleasant Lake is moderate. A public access site with cement ramp is present at the southwest end of the lake. This site has enough parking for 10 vehicles with trailers, and has vault toilets available.

Fishery Resource

The first fishery investigation on this lake was conducted by the Michigan Fish Commission in August 1887 using gill nets. A typical warmwater fish community was noted (bluegill, largemouth bass, yellow perch) and fish were in good condition and exhibiting “large growth”. Two whitefish were also collected, and it was noted that they were “well fed.” No further fishery investigations were conducted until December 1946, when gill nets were fished to verify whitefish (lake herring). None were captured.

Various native warmwater fish were stocked by the State in 1934 and 1937 to 1943. Species stocked included bluegill, largemouth bass, and yellow perch. This practice was discontinued in the mid 1940s due to research showing the ineffectiveness of these types of stockings on top of naturally present populations. In 1949 the stocking of rainbow trout was initiated. Stocking occurred annually through 1995 except for 1970, 1975, and 1992 to 1994. Stocking rates of rainbow trout yearlings ranged from 2 to 28 per acre.

In 1969 the Pleasant Lake Improvement Association started petitioning the Department of Natural Resources to stock walleye. A local pond was procured and a cooperative rearing program started in 1978. The first stockings of spring-fingerling walleye occurred that year (Table 1). Use of this pond for rearing was discontinued in 1979. Walleye stockings resumed in 1983 by the State and continued annually through 1987. Stockings were then done in alternate years through 1995.

Electrofishing and gillnetting were conducted on Pleasant in October 1969 to evaluate the rainbow trout plants. While only 1 rainbow trout was collected, this was the first sampling effort on the lake that provided a more complete picture of the fish population. Lake herring were confirmed in this survey for the first time since 1887 (2 at 16 inches). Other species collected included typical warmwater species as previously mentioned, plus pumpkinseed, warmouth, brown and yellow bullhead, shortnosed gar, green sunfish, lake chubsucker, golden shiner, and grass pickerel.

In June 1979 an electrofishing survey to evaluate walleye found limited walleye survival from the 1978 stocking. Longnose gar were captured for the first time. Growth rates of bass and bluegill were slow. This was the first survey where some growth information was collected. Yellow perch were growing above State average rates.

A more complete fishery survey was conducted in September 1985. Utilizing trap nets, fyke nets, and experimental gill nets, this three-night survey yielded a good sample. Walleye survival was judged as good. Only largemouth bass were growing at State average. All other game fish were

rated as growing below State average. One lake herring was collected (19.1 inches and 2.7 lbs.).

Other limited field investigations included hook-and-line surveys for trout in July of 1991 and 1995, and electrofishing for young-of-year walleye in October of 1991, 1993, and 1995.

The trout-fishing success of Pleasant had been noted as sporadic at best. In 1991, most information showed that fishing for trout had been all but non-existent from 1989 to 1991. Typically, poor trout fishing like this occurs when large zooplankton are over-grazed by fish. This leads to a collapse of the fishery, because zooplankton are the primary forage for rainbow trout. Experience has shown that when a collapse occurs, it is best to cease stockings for three years to give the zooplankton population a chance to recover. Stocking of trout resumed in 1995 for one year only. Although that stocking survived very well, and fishing was excellent for a few anglers, they showed no interest in resuming annual stockings. Stockings of rainbow trout were discontinued that year.

Fall electrofishing for walleye (Serns Indexing) found no survival of the 1991 or 1995 year classes. The 1993 year class was estimated at only 0.3 young of year per acre. Electrofishing rates of 5 – 10 young of year per acre are desired for stocked walleye waters.

The most recent survey of Pleasant Lake was conducted May 7 – 10 and May 29, 1996. Effort included four standard trap nets (6' x 3' with 1.5-inch mesh), four 125-foot inland experimental gill nets, and 1.5 hours of nighttime 250-V DC electrofishing.

The fish community sampled in this survey did not differ significantly from previous investigations. Johnny darter, banded killifish, common shiner, spotted gar, bluntnose minnow, white sucker, and channel catfish were collected in addition to those species previously mentioned. Bluegill, largemouth bass, and yellow perch were the most abundant species collected and are the primary components of the sport fishery (Table 2).

The bluegill was the most abundant species collected by number and weight. Over 54% of 1,339 bluegill collected were of acceptable size (6 inches). Growth rates were 0.3 inches above the Michigan average (Table 3). Ten year classes of bluegill were present (ages 0-9). The majority of bluegills collected were age 2 and 3 (Table 4). Recruitment rates and survival all appear normal except for age 4, which corresponds to the regionally weak year class of 1992. This was due to the colder than normal weather caused by the Philippine volcanic eruption (Mount Pinatubo). Using Schneider's (1990) index of bluegill populations, this population ranked good to excellent (5.4) on a scale of 1-7, using trap-net length-frequency data. This is one of the highest rankings we have observed. This is an exceptionally good looking bluegill fishery.

Yellow perch were the second most abundant species collected by number and weight (Table 2). Over 90% were of acceptable size (7 inches). Eighty percent of the catch was from gill nets. Growth rates of yellow perch were well above State average (Table 3). Age groups 2 and 3 were the most abundant and accounted for over 50% of the catch (Table 4). Yellow perch also appeared to have had a poor year class in 1992, similar to bluegill. The 1991 year class (age 5) was well represented.

A total of 227 largemouth bass, ranging from 3 – 14 inches, was collected (Table 2). Largemouth bass accounted for 9.5% of the total catch. Less than 1% of the catch was of legal size (14 inches). Seven year classes of bass were identified (Table 4). Growth rates of largemouth bass were below State average (Table 3). A slight decrease in 1992 recruitment of bass is evident. Recruitment rates appear good, although growth rates are poor for every year class. Based on only one fish, largemouth bass do not reach legal size until age 7, almost 2 full years later than State average.

Thirty-four black crappie were collected. Most were acceptable size. Their growth rate was well above State average. Only three walleye were collected, representing a single fish each from stockings in 1987, 1991, and 1993. No walleye were collected from the 1995 stocking, which was the highest stocking in terms of number per acre

(Table 1). These fish should have been collected by our various gear sets if they were present.

One channel catfish at 31 inches was collected. The State has not stocked this species in this lake. Bullheads were plentiful. No trout or lake herring were collected. Forage fish were not collected in high numbers, but it is suspected that our gear and efficiency for them was just not good. All fish, except perhaps largemouth bass, were in good condition and healthy.

Overall, the fish populations of this lake are very good, except for largemouth bass. Anglers report excellent fishing for bluegill, and occasional excellent fishing for yellow perch. Yellow perch fishing has historically been popular in the lake, but success declined in the late 1980s and early 1990s. Many anglers felt the stocking of walleye was impacting perch. Rainbow trout may have also impacted perch, as young-of-year perch are found in deep waters in the summer and rainbows may take advantage of this food source.

Various levels of creel census were conducted on several lakes simultaneously, including Pleasant. In June of 1987 anglers harvested 289 yellow perch and 5,707 bluegills. A total of 1,440 angler trips was estimated. Comments from the creel clerk included: excellent bluegill angling, good perch fishing for those that knew where to go, and non-existent rainbow trout angling. Bass angling was rated as good, yet there was no recorded harvest.

In 1994 and 1995, a voluntary, post-card creel survey was run at the lake. This is a relatively new method that is being used in the State that results in fair information at extremely low cost. Over 30 waters have been surveyed with this technique. Postage-paid cards are supplied to local bait shops and successful anglers are asked to report their walleye catch. For the two-year reporting period, only 11 cards representing 17 fish were returned. Catch per acre for walleye was estimated at 0.03 fish – one of the lowest rates observed for southern Michigan.

In 1999 the Pleasant Lake Association made a request to lower the largemouth bass size limit to 10 inches. This was prompted by the fact that in

1998 we did lower the size limit on Corey Lake, just south of Pleasant. It is fact that there are extremely few bass that reach legal size of 14 inches in Pleasant and that their growth rates are poor. Surveys from 1969, 1979, and 1985 all show similar length frequencies of bass. Growth rates have also been about the same. But it is noted that these older surveys all produced at least one bass over 18 inches, and few more fish than this latest survey at 14-15 inches.

The Pleasant Lake largemouth population exhibits a very similar length frequency to Corey Lake. A large stockpiling of bass occurs at 7 – 11 inches. Comparisons of catch-per-hour from electrofishing data show more than double the number of bass in the 1990s compared to the 1969 and 1979 surveys. This information seems to indicate a very similar situation with the bass population in Corey Lake.

Management Direction

Although trout were stocked almost annually for nearly 50 years, it has become obvious that anglers were not targeting this lake and taking advantage of the trout fishery present. Most trout angling is done at night in the summer, and although there is quite a bit of nighttime angling in the lake, they are all targeting bluegill. Our current management action of no trout stocking should continue.

Walleye stockings proved to provide a minimal fishery at best. Other waters in our management unit provide a much better return on stockings. In many years walleyes are a limited commodity, and as such should be used elsewhere to provide fishing opportunities. Our current management action of no walleye stocking should continue.

Although no lake herring were captured, we have had reports of spawning concentrations in the fall. Water quality characteristics are favorable for the continued existence of this species, but are not excellent.

Pleasant Lake has an excellent warmwater fishery present, with the exception of largemouth bass. Bluegill and yellow perch populations are some of the best that we have sampled in southwest Michigan. At this time our management should concentrate on the natural populations of fish present. If the size limit on bass can be reduced, evaluation of any change should be conducted in the 4th or 5th year.

Report completed April 28, 2001.

References

- Cowan, E. S. 1983. Soil survey of St. Joseph County, Michigan. United States Department of Agriculture.
- Fusilier, W. E., and B. Fusilier. 1992. An atlas and gazetter of Michigan lakes. Dexter, MI.
- Schneider, J. C. 1990. Classifying bluegill populations from lake survey data. Michigan Department of Natural Resources, Fisheries Technical Report 90-10, Ann Arbor.

Table 1.—Number of spring-fingerling walleye stocked into Pleasant Lake, Fabius Township, St. Joseph County.

Year	Number	Number per Acre
1978	3,660	14
1983	2,900	11
1984	8,000	31
1985	5,000	19
1986	5,200	20
1987	5,432	21
1989	4,977	19
1991	4,442	17
1993	8,037	31
1995	14,489	55

Table 2.—Number, weight, and length (inches) of fish collected from Pleasant Lake with trap nets and DC boomshocker, May 1996.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches)¹	Percent legal size²
Banded killifish	25	1.0	0.2	0.0	2-2	100
Black crappie	34	1.4	13.1	2.2	5-12	78
Bluegill	1,339	56.0	268.9	44.3	1-9	60
Bluntnose minnow	35	1.5	0.2	0.0	2-2	-
Bullhead catfishes (family)	141	5.9	0.0	0.0	6-15	100
Channel catfish	1	0.0	11.0	1.8	31-31	100
Common shiner	1	0.0	0.3	0.0	8-8	-
Grass pickerel	5	0.2	1.1	0.2	9-11	-
Green sunfish	5	0.2	0.3	0.0	2-5	0
Johnny darter	15	0.6	0.0	0.0	1-1	-
Lake chubsucker	8	0.3	3.1	0.5	5-10	-
Largemouth bass	227	9.5	102.0	16.8	3-14	11
Pumpkinseed	19	0.8	6.2	1.0	5-8	38
Spotted gar	6	0.3	12.3	2.0	19-31	100
Walleye	3	0.1	13.0	2.1	18-28	100
Warmouth	92	3.9	16.2	2.7	2-7	41
White sucker	1	0.0	0.5	0.1	10-10	100
Yellow perch	432	18.1	158.5	26.1	3-12	77

¹ Some fish may be measured to 0.1 inch, others to inch group: e.g., “5” = 5.0 to 5.9 inches; “12” = 12.0 to 12.9 inches, etc.

² Percent legal size or acceptable size for angling.

Table 3.—Average weighted total length (inches) at age, and growth relative to the State average, for fish sampled from Pleasant Lake with trap nets and DC boomshocker, May 1996. Number of fish aged is given in parentheses.

Species	Age										Mean growth index ¹
	1	2	3	4	5	6	7	8	9	10	
Black crappie	-	6.3 (2)	9.2 (23)	10.7 (3)	-	12.5 (2)	-	-	-	-	1.7
Bluegill	1.7 (9)	2.7 (15)	5.0 (31)	6.8 (8)	8.0 (11)	8.3 (5)	8.7 (1)	9.0 (1)	9.0 (3)	-	0.3
Largemouth bass	3.7 (9)	6.2 (22)	8.3 (20)	10.5 (11)	11.7 (16)	13.1 (5)	14.5 (1)	-	-	-	-0.6
Walleye	-	-	18.3 (1)	-	21.2 (1)	-	-	-	28.2 (1)	-	-
Yellow perch	3.4 (2)	5.9 (20)	8.2 (30)	10.0 (4)	11.0 (14)	11.7 (7)	11.3 (4)	11.5 (8)	12.7 (2)	12.1 (2)	1.5

¹ Mean growth index is the average deviation from the State average length at age.

Table 4.—Estimated age frequency (percent) of fish caught from Pleasant Lake with trap nets and DC boomshocker, May 1996.

Species	Age									
	1	2	3	4	5	6	7	8	9	10
Black crappie	-	7	77	10	-	7	-	-	-	-
Bluegill	11	18	37	10	13	5	1	1	4	-
Largemouth bass	11	26	24	13	19	6	1	-	-	-
Walleye	-	-	33	-	33	-	-	-	33	-
Yellow perch	2	22	32	4	15	8	4	9	2	2

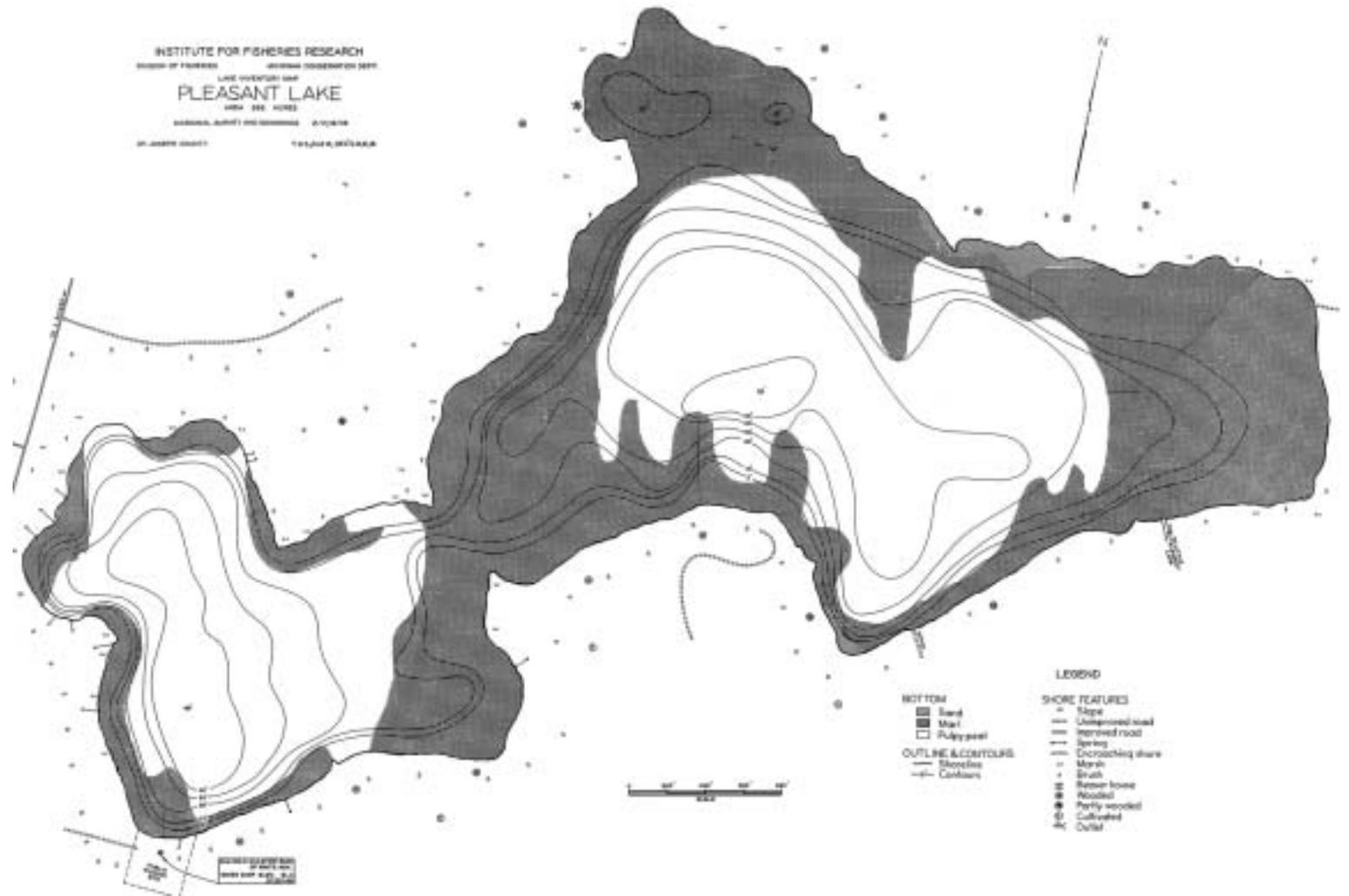


Figure 1.-Map of Pleasant Lake, St. Joseph County, showing depth contours in feet and other features.