Michigan Department of Natural Resources
Status of the Fishery Resource Report 93-8, 1993.
Renumbered in 2024, Status of the Fishery Resource Report 0038

PONTIAC LAKE

Oakland County (T3N, R8 & 9E, Sections 11-14, 18)
Surveyed June and July 1992

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Environment

Pontiac Lake is a man-made impoundment created in 1926 when Lime Lake, a small lake in the upper Huron River watershed, was dammed. It lies about 7 miles west of Pontiac, Michigan.

A mosaic of wooded rolling hills, marshes, old farm fields, and highly urbanized sections characterize the geography of the area. Soils are predominantly sandy with scattered gravel deposits. The Huron River, a major Lake Erie tributary, begins 6 miles northwest of Pontiac Lake and flows through the lake, entering at the western end and exiting at the dam on the southeastern shore.

Pontiac Lake is 585 acres in size and up to 34 feet deep. It has numerous islands and peninsulas. The lake bottom is primarily composed of fiberous peat and other organics with some sand. Over 60% of the lake is 5-feet deep or less, while approximately 20% is over 10 feet deep. Aquatic vegetation, including milfoil, has been at nuisance levels since the mid-1970s.

Water quality conditions were last surveyed on July 20, 1992. The water was slightly brown with a Secchi disk reading of 6 feet, indicating moderate clarity. Within the water column, alkalinity ranged from 126 ppm to 176 ppm and pH ranged from 7.7 to 8.2. These indicated the water is hard and well buffered. Temperature varied from 69.4°F at the surface to 49.1°F at the bottom, with the thermocline occurring between 16 and 28 feet. Typically, summer oxygen levels are sufficient for fish down to a depth of 18 feet. Overall water quality is good, but limits fish populations to those suited for shallow, warmwater conditions.

Development around Pontiac Lake has been intense. With the exception of approximately 1 mile of state-owned shoreline on the north side and extensive marshes at the west end, the shoreline is completely developed with residential dwellings and associated bulkheads and riprap. Several of the islands have seasonal or permanent residences on them. A major highway, M&endash;59, borders the lake at a point on the south shore. Much of the surrounding area has been highly urbanized with residential dwellings, businesses, and the Pontiac Airport. A public boat ramp is located in the State Recreation Area at the east end of the lake. A private boat ramp and boat rentals/marinas are available at the western end. Shore fishing is available along the Pontiac State Recreation Area and from a state fishing pier.

Fisheries Resource

According to historical records, fishery management at Pontiac Lake was limited prior to 1970. A state public fishing site existed prior to 1945. In 1945, the lake was mapped and a fish survey was conducted. The fish community included bluegill, pumpkinseed, black crappie, yellow perch, largemouth bass, and bullhead.

A creel census was conducted from spring 1946 through winter 1961-62 to evaluate several changes in fishing regulations (Schneider and Lockwood 1979). During this period, Pontiac Lake supported a strong recreational fishery. Bluegill and largemouth bass were the primary target species. In 1947, anglers harvested an amazing 449 bluegill per acre from the lake. Northern pike were not a major component of the fishery. Bluegill growth declined over the 16-year period, while largemouth bass and northern pike growth remained above average. The regulation changes had little apparent affect on the fish populations in the lake.

Tiger musky were introduced in 1970 and added through 1980. Surveys during this time indicated the species composition of the fish community remained about the same with an occasional tiger musky, rock bass, and northern pike included in the samples. Slow panfish growth rates became a concern in the mid&endash;70's. A panfish thinning project was proposed in 1976, but was never conducted.

In 1980 another creel census was conducted on Pontiac Lake (Ryckman and Lockwood 1985). Overall fishing pressure, total catch, and catch per hour had significantly declined since the 1946-62 creel census. Certainly much of this decline was a result of the substantial decline in the bluegill fishery. While the bluegill was the primary species sought by Pontiac Lake anglers in the early census period, the largemouth bass accounted for 50% of the angler pressure in 1980. Bluegill harvest during the May to October 1980 period was only 15.3 fish per acre.

The change in the statewide largemouth bass size limit in 1976 (10-inch minimum to 12-inch minimum) and its effect on the bass fishery and population at Pontiac Lake were examined in 1980 (Goudy 1981). Largemouth bass population density was found to be about average for similar-size southern Michigan lakes. Angler harvest of largemouth bass at Pontiac Lake was above average, but bass mortality rates were slightly below average. The increased minimum size limit effectively decreased largemouth bass harvest, increased population size, and provided better fishing for larger bass.

In 1981, Pontiac Lake was drawn down 10 feet to facilitate dam repairs. Due to a series of unfortunate circumstances, the drawdown resulted in a winterkill of all fish in January, 1982 (Spitler 1984). The lake was restocked with fathead minnows, largemouth bass, bluegill, black crappie, yellow perch, northern pike, and channel catfish. A fish survey in 1986 indicated that good numbers of gamefish had been reestablished in Pontiac Lake, but bluegill and pumpkinseed average size was small. Carp, bowfin, and bullhead abundance was also undesirably high. Intensive netting in 1987 resulted in the removal of 500 carp during 1 week.

Beginning in 1988, catch-and-release fishing for bass was allowed during April and May (prior to the traditional bass season opener) as part of a research study. The study found that the early season catch-and-release fishing did not negatively impact the bass population (Schneider et al. 1991). The study recommended that early season catch-and-release bass fishing continue at Pontiac Lake.

Electrofishing surveys in 1988, 1990, and 1991 indicated continued high abundance of small bluegill and pumpkinseed. Walleye fingerlings were stocked in 1990 at a rate of 217 per acre, in an attempt to increase predator abundance. Follow up surveys indicated walleye experienced very poor survival.

Water-based recreation at Pontiac Lake is varied. Power boating, jet skiing, water skiing, swimming, and duck hunting are all common seasonal activities. However, dense milfoil growth has prevented many of these activities from reaching the intensity encountered on many southeast Michigan lakes. As a result, conflicts between these resource uses and fishing have been minimal. However, a chemical treatment with Sonar, in May 1992, greatly reduced macrophyte abundance. In fact, visual surveys in June and July, 1992, found no live milfoil and very few rooted aquatic plants of any type.

The fish community was most recently surveyed June 1&endash;4, 1992. The netting effort entailed overnight sets of six trap nets for 3 nights, overnight sets of two fyke nets for 1 night, and overnight sets of two gill nets for 1 night.

The 1992 survey documented a fish community heavily dominated by small panfish and carp (Table 1). Combined, bluegill and carp accounted for 92% of the total catch by number, and 88% by weight.

Bluegill average length was small at 5.2 inches. Even more disturbing, only 2% of the bluegill collected were of acceptable size for angling (larger than 6 inches). In addition, bluegill condition appeared poor with most individual fish noticably emaciated. Compared with 6-inch bluegill from Lake Orion, Pontiac Lake fish weighed 28% less. On a scale of 1 to 7 (Schneider 1990), the quality of the Pontiac Lake bluegill population ranked 1.3, "very poor".

By number, carp were second in abundance. By weight, carp dominated the catch, accounting for 65% of the total weight of fish collected in the trap nets. Carp average size was 20.5 inches. Only three carp smaller than 17 inches were collected and it appears that carp reproduction in recent years has been minimal.

Few gamefish were netted. Although low catches of smallmouth and largemouth bass are expected during summer net surveys, the low numbers of other gamefish species collected were unexpected. Only a few northern pike and channel catfish were handled.

Largemouth bass were sampled better with a pulsed DC electrofishing boat on July 27, 1992. During 1.25 hours of shocking after dark, a total of 62 largemouth bass were collected. Nineteen percent of the bass were legal size (larger than 12 inches). No young-of-the-year and only two age I fish were collected, suggesting weak year classes for 1991 and 1992. Length frequency distribution indicates an absence of 12- to 14-inch fish. This may represent previous weak year classes, or the impact of angler harvest.

Growth rates of important game fish species are poor (Table 2). All five species for which adequate scale samples were collected-bluegill, pumpkinseed, black crappie, yellow perch, and largemouth bass-are growing well below state average. Black crappie and bluegill are particularly slow growing.

Age composition and survival characteristics of several game fish species exhibit irregularities (Table 3). Bluegill, pumpkinseed, and yellow perch are heavily dominated by one or two year classes. Age I largemouth bass are very poorly represented. Largemouth bass survival from Age IV to Age V (coinciding with attainment of legal size) is poor.

Fishing reports reflect the fish community documented by the 1992 surveys. While good bass fishing reports are common, very few panfish anglers even try their luck at Pontiac Lake. Northern pike ice fishing activity has declined since 1988. In general, the present fish community limits fishing opportunities.

Management Direction

Currently, no active fishery management practices are underway at Pontiac Lake. If fishing opportunities are to approach their potential, balance between the predator species and bluegill and carp must be restored. Continued control of milfoil is needed to allow progress on the bluegill stunting problem.

Our goals for the next 8 years will be to (1) improve the bluegill fishery as reflected by an increase in the rank from 1.3 to 4.0 on the Schneider (1990) scale, (2) improve the northern pike fishery by increasing abundance as indicated by trap net and gill net catch-per-unit effort (CPUE) of 1.0 or

higher, (3) maintain the largemouth bass fishery, and (4) decrease carp abundance as indicated by trap net CPUE of 9.5 or less.

Goal Number 1 will likely be the most difficult to attain. However, the recent success in chemical control of nuisance milfoil growth is promising. Return of milfoil to nuisance levels will severely impair long term improvement of the bluegill fishery. The most serious obstacle to goals Number 2 and 3 is excessive angler harvest of northern pike and largemouth bass. The major obstacle to goal Number 4 is the traditional angler disinterest in fishing for and harvesting carp.

Pontiac Lake's size, shallow depths, severe weed problems, and abundant human impacts provide serious challenges to improving recreational fishing.

Report completed: October 22, 1992.

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Table 1.-Number, weight, and length indices of fish collected from Pontiac Lake with fyke, gill, and trap nets, June 1-4, 1992.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches)[1]	Average length	Percent legal size[2]
Bluegill	2,847	84	196.5	24	1-7	5.2	2
Carp	260	8	532.8	64	9-30	20.5	-
Pumpkinseed	82	2	7.9	1	2-5	5.0	0
Spotfin shiner	66	2	0.2	<1	1-3	2.7	-
Black crappie	41	1	6.6	1	5-9	6.9	41
Yellow perch	21	1	2.6	<1	6-8	6.7	19
Bullhead spp.	21	1	10.0	1	7-12	9.9	100
Rock bass	14	<1	5.5	<1	6-9	8.1	100
Bowfin	8	<1	36.6	4	18-26	23.3	-

Largemouth bass	5	<1	7.6	1	8-17	13.7	60
Channel catfish	5	<1	23.4	3	18-25	21.1	100
White sucker	2	<1	2.2	<1	12-15	14.0	-
Golden shiner	2	<1	0.3	<1	8	8.5	-
Smallmouth bass	1	<1	2.6	<1	17	17.5	100
Green sunfish	1	<1	0.1	<1	5	5.5	0
Bluntnose minnow	1	<1	<0.1	<1	2	2.5	-
Northern pike	1	<1	0.5	<1	14	14.5	0
Total	3,378	100.0	853.4	100			

[1]Note some fish were 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. Legal size or acceptable size for angling is given in parentheses.

Table 2.-Average total length (inches) at age, and growth relative to the state average, for five species of fish sampled from Pontiac Lake with gill, trap, and fyke nets on June 2-4, 1992, and with electrofisher on July 27, 1992. Number of fish aged is given in parentheses.

	Age								Mean growth
Species	I	II	III	IV	V	VI	VII	VIII	index[1]
Bluegill	2.0 (17)	2.8 (18)	3.8 (12)	4.6 (21)	5.7 (36)	6.4 (10)	6.9 (4)	-	-1.3
Pumpkinseed	2.1 (1)	3.6 (1)	4.7 (13)	5.0 (20)	5.3 (6)	6.2 (2)	-	-	-0.8
Black crappie	-	5.5 (6)	6.7 (8)	6.6 (12)	7.3 (10)	7.5 (4)	9.1 (1)	-	-1.7
Yellow perch	-	-	6.2 (7)	6.5 (10)	7.2 (2)	7.4 (1)	8.5 (1)	-	-1.0
Largemouth bass	4.8 (1)	7.3 (17)	9.1 (14)	11.2 (17)	12.8 (2)	15.2 (1)	15.3 (3)	16.3 (2)	-1.2

[1]Mean growth index is the average deviation from the state average length at age.

Table 3.-Estimated age frequency (percent) of fish caught from Pontiac Lake with gill, fyke and trap nets on June 2-4, 1992 and with electrofisher on July 27, 1992.

	Age								Number
Species	I	II	III	IV	V	VI	VII	VIII	caught
Bluegill	1	1	6	35	56	1	-	-	2847
Pumpkinseed	1	-	9	66	20	4	-	-	82
Black crappie	-	15	20	27	25	10	3	-	41

Yellow perch	-	-	33	48	9	5	5	-	21
Largemouth bass	3	28	23	28	3	1	5	9	61

PONTIAC LAKE
Oakland County (T3N, R8 & 9E, Sections 11, 12, 13, 14, 18)

MANAGEMENT PLAN
based on
Status of the Fishery Resource Report 93-8

Michael V. Thomas

Four management goals based on the 1992 survey are detailed below. The year 2000 is the target date for achieving these goals. Goal number one is to improve the bluegill population and fishery. A rank of 4.0, or satisfactory, on a scale of 1 to 7 (Schneider 1990) is the target level. A major factor in this effort is the continued control of milfoil abundance. Bluegill population response to vegetative control alone may be substantial. This response will be evaluated with a fish survey in 1994. Specifically, length&endash;frequencies, growth rates, and catch rates of bluegill will be compared with previous survey data. If bluegill response is inadequate future actions might include partial or total chemical reclamation of the fish community.

Goal number two is to improve the northern pike population and fishery to an abundance level of trap net or gill net CPUE of 1.0 or higher. Northern pike fingerlings will be stocked on alternate years at a rate of 50 per acre, beginning in 1993. Year class strength will be evaluated with a fish survey in 1994. Potential obstacles to achieving this goal include availability and quality of northern pike fingerlings from the state hatchery system and excessive harvest of northern pike by anglers. The expected yield to the fishery is one adult pike per acre, or 585 fish annually.

Goal number three is to maintain the existing largemouth bass population and fishery. No active management is planned to achieve this goal. In fact, improvement of the bluegill population should benefit bass reproduction and growth of young bass.

Goal number four is to decrease carp abundance about 50%, or trap net CPUE to 9.5 or less. We should work cooperatively with several local fishing businesses to establish an annual spring bowfishing contest at Pontiac Lake, perhaps a two-day weekend event. Secondly, all carp handled in the 1994 survey should be removed from the lake (disposal must be pre-arranged). Obstacles to this goal include limited angler interest in carp, disposal problems with quantities of dead carp, and variability of carp catches in trap nets. Vulnerability of carp to bowfishing should improve with control of milfoil abundance.

Plan completed: September 1, 1992.
Approved: Ronald J. Spitler, District Biologist, March, 1993.
John Trimberger, Acting Regional Biologist, March, 1993.

Last Update: 08/05/02
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