Pratt Lake

Kent County, T06N, R09W, S25
Grand River Watershed, Last Surveyed 2021

Addie Dutton, Fisheries Management Biologist

Environment

Pratt Lake is a 150-acre lake located approximately four miles south of the city of Lowell in Kent County (Figure 1). Pratt Lake has a small inlet on the eastern side of the lake and one outlet (Pratt Lake Creek), which is a Type-1 trout stream. Pratt Lake is shallow with a maximum depth of 14 feet. Most of the lake is very shallow, with extensive submergent and emergent vegetation throughout. The bottom is dominated by organic sediments that are often classified as "muck". The majority of the shoreline of Pratt Lake is undeveloped. Three homes are located on the northern shore of the lake, but the remainder of the lake is either in state ownership or privately owned but undeveloped. A Michigan Department of Natural Resources (DNR) boating access site is located on the northeastern shore of the lake. The boating access site has a hard surfaced ramp, but no skid pier. The water depth at the boat launch is shallow and the substrate after the hard surfaced area is predominantly muck. For these reasons, launching large boats is not recommended. The launch is currently best suited for kayaks, canoes, or small flat bottom boats with tiltable motors. The access site has parking for nine vehicles with trailers but does not have a restroom facility.

History

Pratt Lake was initially surveyed by the Michigan Fish Commission on June 30, 1891. No fisheries data was recorded, but the lake was documented in detail. The western shore and riparian areas were described as "high", and the rest of the lake was "low" and "swampy" (Sargean 1891). The bottom substrate was muddy and soft. Pratt Lake was known to have Bluegill, Sunfish (most likely Pumpkinseed), and Yellow Perch in 1891, but this was not confirmed through netting. The survey also noted that the lake had been drained, so that nearly 200 feet of shoreline was exposed around the lake.

Pratt Lake did not have public access until 1974, so prior status of the lake is unknown. Two historical fish stockings (pre-1980) were recorded, but no additional information was provided (Table 1). One note in the files recorded a winterkill occurring in 1940. In 1980, a public boating access site was developed on Pratt Lake. Site development included dredging of a channel to facilitate navigation between the ramp and the main basin of the lake. The first fisheries survey was completed in August 1980. Pratt Lake was surveyed with trap nets, fyke nets, and gill nets for one night. Brown Bullhead represented the majority of the catch with 559 individuals captured with an average length of 7.2 inches. Other species captured included Northern Pike (n=21), Pumpkinseed (n=13), and White Sucker (n=9). The survey noted that Pratt Lake had thick weed cover, a maximum depth of 8 feet, and had visibility around 1-2 feet in shallow water areas.

In 1981, adult Bluegills were trapped in Townline Lake in Montcalm County and transferred to Pratt Lake. In an effort to assess the Bluegill transfer and potential winterkills, a survey was conducted in May 1982. Three trap nets and two mini-fyke nets were set for one night. Fathead Minnow (n = 1,310)

was the most abundant fish species captured. Black Bullheads were also still numerous with 335 individuals captured. Eighty-six Golden Shiners were captured in the mini-fyke nets. Few gamefish species were collected. Green Sunfish were the most numerous gamefish captured with 68 individuals. Other species collected included: Bluegill (n=7), Pumpkinseed (n=16), Black Crappie (n=3), and one Northern Pike. The Black Bullhead were noted to be in poor condition with sores present. After the low catch of Northern Pike in the 1982 survey, Northern Pike were recommended to be stocked. In 1983, over 350,000 small fingerling Northern Pike were released into Pratt Lake. Extended growth fingerling Northern Pike were stocked in 1985 (Table 1).

Pratt Lake has a long history of winterkills. The winter of 1985 and 1986 resulted in a partial winterkill event. In September 1986, the lake was surveyed with three trap nets to assess the Northern Pike population. Twenty-three Northern Pike, 56 Brown Bullheads, four Yellow Bullheads, one Pumpkinseed, and 17 White Suckers were captured. Age structures were removed from Northern Pike for growth analysis. Age 1-4 Northern Pike were present in Pratt Lake, and they were growing much slower than the statewide average. Pratt Lake was not surveyed from 1982 until 2021 when the most recent fisheries survey was completed.

Current Status

Pratt Lake was surveyed on October 25, 2021 after Fisheries Division received numerous complaints by anglers and staff within the Parks and Recreation Division (PRD) of DNR regarding the abundance of undersized Largemouth Bass present in the lake. A one-night electrofishing survey of the entire shoreline of Pratt Lake was completed specifically targeting Largemouth Bass. The survey was originally planned to be conducted in mid-May, but the amount of aquatic vegetation prevented the survey. All fish were netted, identified to species, and measured to the inch bin (e.g., 7-inch bin included fish from 7.0-7.9 inches). The first 10 individuals per inch bin for Bluegill, Largemouth Bass, and Northern Pike were measured to the tenth of an inch and an age structure was removed. Scales were removed from Bluegills less than 8 inches in length and Largemouth Bass less than 10 inches in length. Anal spines were removed from Bluegills greater than 8 inches in length and Largemouth Bass greater than 10 inches in length. Dorsal rays were removed from all Northern Pike regardless of size.

A total of 441 fish representing 12 species and one hybrid were collected during the 2021 survey (Table 2). Bluegill was the most numerous fish species captured with 247 individuals. Bluegills varied in size from 1.2 inches in length to 7.7 inches in length (Figure 2). Six age-classes of Bluegills were present in Pratt Lake: age-0 through age-5. On average, Bluegills in Pratt Lake were growing slightly slower compared to Bluegills statewide (Table 3). Largemouth Bass were the second most captured species with 128 individuals. Largemouth Bass varied in size from 2.5 inches in length to 17.6 inches in length (Figure 3). Nine age-classes of Largemouth Bass were present (age-0 through age-8). Largemouth Bass in Pratt Lake were growing much slower compared to Largemouth Bass statewide (Table 3).

None of the other fish species caught during the 2021 survey were highly abundant. Other gamefish species captured included Black Crappie, hybrid sunfish, Northern Pike, Pumpkinseed, and Yellow Perch. Three species of forage fish were collected in 2021: Brook Silverside, Golden Shiner, and Iowa Darter. The other species captured included Bowfin, Brown Bullhead, and White Sucker. These

species are sometimes considered undesirable but can providing exciting fishing opportunities. Predators (Largemouth Bass, Northern Pike, and Bowfin) composed 70% of the total fish biomass.

Analysis and Discussion

The timing of the 2021 survey complicates comparisons to other lakes across Michigan or southwest Michigan. Typically, night electrofishing is conducted in May and June when water temperatures are between 65F and 70F and Centrarchidae species are nearshore to spawn. Understanding these differences, comparisons between the Pratt Lake October electrofishing data and the cumulative statewide and southwestern Michigan May and June electrofishing data for Status and Trends Program surveys conducted during 2001-2021 were analyzed. In Pratt Lake, the catch-per-unit-effort (CPUE) for Bluegills was 3.98 fish per minute. Compared to statewide CPUE for Bluegills in May and June, this is near the median of 4.10 fish per minute. However, compared to other lakes in southwestern Michigan this is lower than the 25th percentile (4.32 Bluegills per minute). A Schneider Index score was calculated for Pratt Lake. The Schneider Index scores Bluegill fisheries based on the size distribution of fish captured (Schneider 2000a). Scores range from 1 (very poor) to 7 (superior). The electrofishing Schneider Index score for Bluegill was 4 which is satisfactory. This is a fairly high score for Bluegills captured only by electrofishing in southwestern Michigan.

The Largemouth Bass CPUE for Pratt Lake was 2.06 fish per minute. This is higher than the 75th percentile (1.72 Largemouth Bass per minute) for lakes statewide in May and June. Additionally, the Pratt Lake Largemouth Bass CPUE is similar to lakes in southwestern Michigan sampled in May and June, with the median of 1.77 Largemouth Bass per minute and the 75th percentile of 2.45 Largemouth Bass per minute.

The high catch rates of Largemouth Bass during a non-traditional sampling time indicates that the population is most likely abundant. It appears that competition for food may be contributing to the slow growth rate and undesirable length frequency distribution of Largemouth Bass in Pratt Lake. Schneider (2000b) observed that predators typically composed 20-50% of the biomass in lakes with strong fisheries. According to that standard, the Pratt Lake fish community is heavily skewed towards predators. The current minimum size limit for Largemouth Bass is 14 inches. Of the 128 Largemouth Bass captured in 2021, only two fish were legal for harvest.

The fish community of Pratt Lake changed dramatically from the 1986 survey to the 2021 survey. Largemouth Bass and Bluegills were not captured during the 1986 survey but were the dominant fish species captured in the 2021 survey. Bluegill and Largemouth Bass were previously stocked into Pratt Lake, so they were not initially introduced into the lake during the 35-year period without any fish surveys. However, someone may have increased the abundance of Bluegill and Largemouth Bass into the lake by illegally stocking additional fish which subsequently were able to reproduce successfully. This theory cannot be confirmed but is a plausible explanation for the observed change in the fish community. Pratt Lake also had a long history of winterkills prior to the 1986 survey. Winter kills appear to be less frequent now as evidenced by the presence of age-8 Largemouth Bass during the 2021 survey. The reduction in winterkills (i.e., long periods of snow and ice cover on the lake during winter which allow decomposition to consume dissolved oxygen to the point at which low dissolved oxygen levels cause fish to die) could be a result of climate change, which has led to milder winters.

The low bullhead CPUE during the survey was surprising. Electrofishing gear is not the most efficient gear to sample Bullheads, but there still appears to have been a substantial decline in the population density of Bullheads in the lake. There are two factors that may have contributed to the decline in bullhead abundance: predation and environmental changes. Largemouth Bass are known to prey on bullheads (Liao et al. 2002). Thus, the rise in Largemouth Bass within the lake may have increased predation pressure on juvenile bullheads. Bullheads also tend to dominate the fish community in turbid waters with low oxygen levels. Over half of the land within the Pratt Lake watershed is utilized for agriculture, and there is a golf course near the northern shore of the lake. It is possible that implementation of best management practices within the watershed have reduced inputs of nutrients and other pollutants to Pratt Lake. Unfortunately, the time series of water chemistry and transparency data necessary to assess this hypothesis are lacking.

Management Direction

1. Consider liberalizing the Largemouth Bass regulation to a 10-inch minimum size limit, with a daily bag limit of five Largemouth Bass.
2. Encourage anglers to harvest Largemouth Bass in an effort to decrease the population and potentially increase the size structure of Largemouth Bass in Pratt Lake.
3. Improve the DNR boating access site to allow easier access for anglers and boaters alike.

References

Liao, H., C. L. Pierce, and J. G. Larscheid. 2002. Diet dynamics of the adult piscivorous fish community in Spirit Lake, Iowa, USA 1995-1997. Ecology of Freshwater Fish 11:178-189.

Sargean, M.D. 1891. Fisheries survey of Pratt Lake, Kent County. Michigan Fish Commission, Examination of Interior Lakes.

Schneider, J. C. 2000a. Interpreting fish population and community indices. Chapter 21 in Schneider, J. C., editor. 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Schneider, James C. 2000b. Weighted average length and weighted age composition. Chapter 15 in Schneider, James C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Tables and Figures

Table 1. Fish stocked from 1878 to 2022 into Pratt Lake, Kent County.

Year	Species	Number	Life Stage	Average Length (in)
1878	American Eel	5,000	Spring fingerling	Unknown
1909	Largemouth Bass	3,000	Fingerling	Unknown
1981	Black Crappie	35	Adult	Unknown
1981	Pumpkinseed	48	Adult	Unknown
1981	Bluegill	320	Adult	Unknown
1983	Northern Pike	351,890	Spring fingerling	0.88
1985	Northern Pike	2,512	Fingerling	4.49

Table 2. Number, weights, and lengths for fish species collected during the 2021 fall survey on Pratt Lake, Kent County. Fish were captured using nighttime boat electrofishing.

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in)	Percent legal size
Black Crappie	1	0.2	0.3	0.2	8.0-8.9	100
Bluegill	247	26	28.7	21.3	1.0-7.9	40
Bowfin	1	0.2	3.5	2.6	21.0-21.9	N/A
Brown Bullhead	1	0.2	0.6	0.4	10.0-10.9	N/A
Brook Silverside	22	5	<0.1	<0.1	3.0-3.9	N/A
Golden Shiner	6	1.4	0.5	0.3	3.0-7.9	N/A
Hybrid Sunfish	3	0.7	0.8	0.6	6.0-7.9	100
Iowa Darter	1	0.2	<0.1	<0.1	2.0-2.9	N/A
Largemouth Bass	128	29	79.2	58.8	2.0-17.9	2
Northern Pike	3	0.7	12	8.9	16.0-34.9	33
Pumpkinseed	18	4.1	5.4	4	2.0-8.9	83
White Sucker	1	0.2	1	0.7	13.0-13.9	N/A
Yellow Perch	9	2	2.7	2	5.0-10.9	89

[1] Harvestable size is defined as 6 inches for Bluegill, Hybrid Sunfish, and Pumpkinseed and 7 inches for Black Crappie and Yellow Perch.

Table 3. Age and growth analysis for Bluegill (top), Largemouth Bass (middle), and Northern Pike (bottom) captured in Pratt Lake, Kent County during the 2021 fall survey.

Age	# Aged	Length Range (in)	State Average Length (in)	Weighted Mean Length (in)	Mean Growth Index
0	10	1.2-1.7	1.8	1.5	-0.6
1	13	2.1-3.3	3.8	2.5	
2	13	3.3-5.0	5.0	4.3	
3	17	4.3-6.5	5.9	5.9	
4	14	5.4-7.4	6.7	6.6	
5	2	7.4-7.7	7.3	7.6	

Age	# Aged	Length Range (in)	State Average Length (in)	Weighted Mean Length (in)	Mean Growth Index
0	11	2.5-3.5	4.2	2.9	-1.7
1	12	4.6-7.7	7.1	6.3	
2	22	7.8-9.8	9.4	9	
3	8	10.0-11.2	11.6	10.4	
4	7	10.4-11.9	13.2	11	
5	12	11.6-12.7	14.7	12.1	
6	8	12.4-13.7	16.3	12.9	
7	1	17.3	17.4	N/A	
8	1	17.6	18.3	N/A	

Age	# Aged	Length Range (in)	State Average Length (in)	Weighted Mean Length (in)	Mean Growth Index
2	1	16.9	20.8	N/A	N/A
4	1	19.5	25.5	N/A	
6	1	34.3	29.3	N/A	

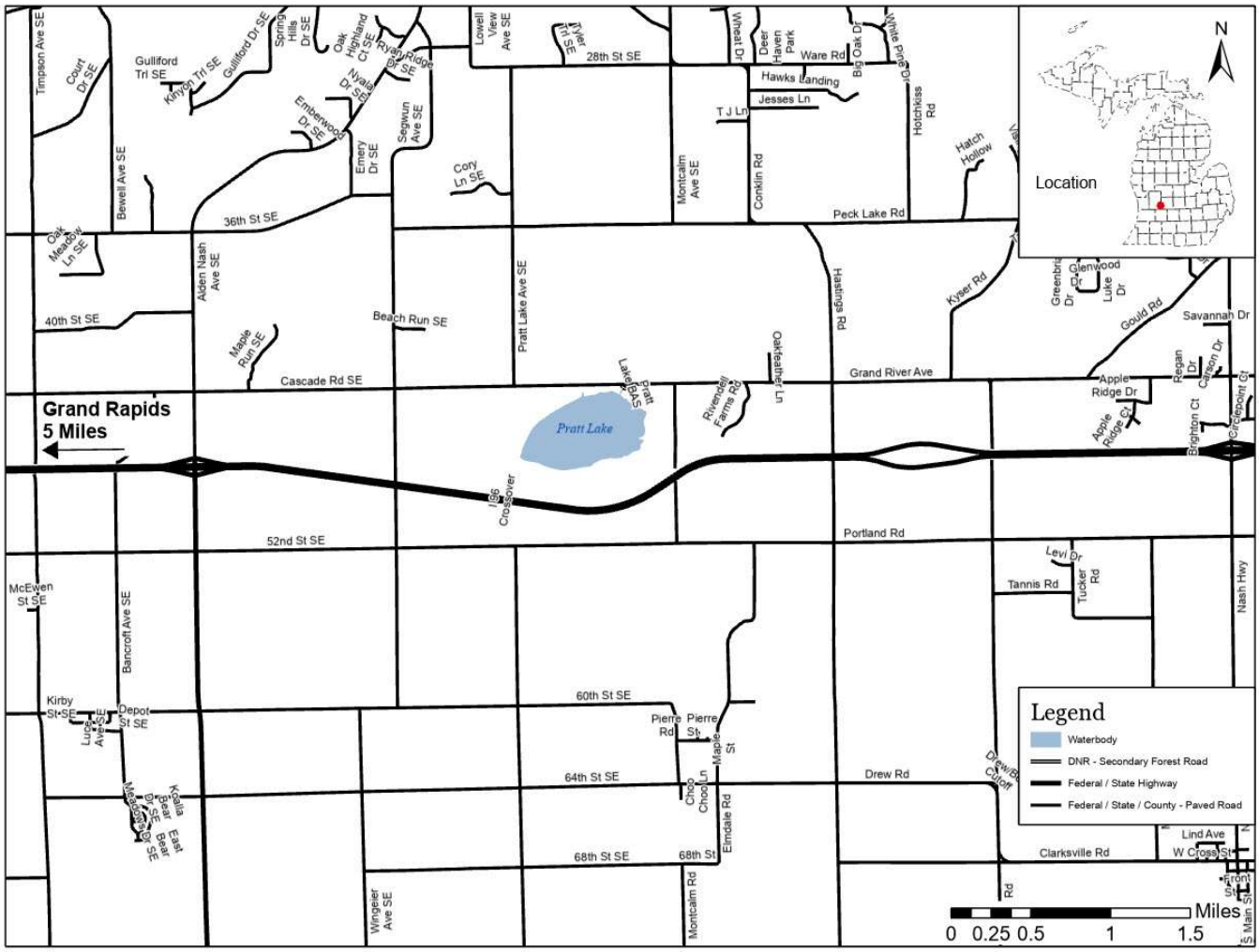

Figure 1. Map of Pratt Lake, Kent County Michigan and surrounding area.

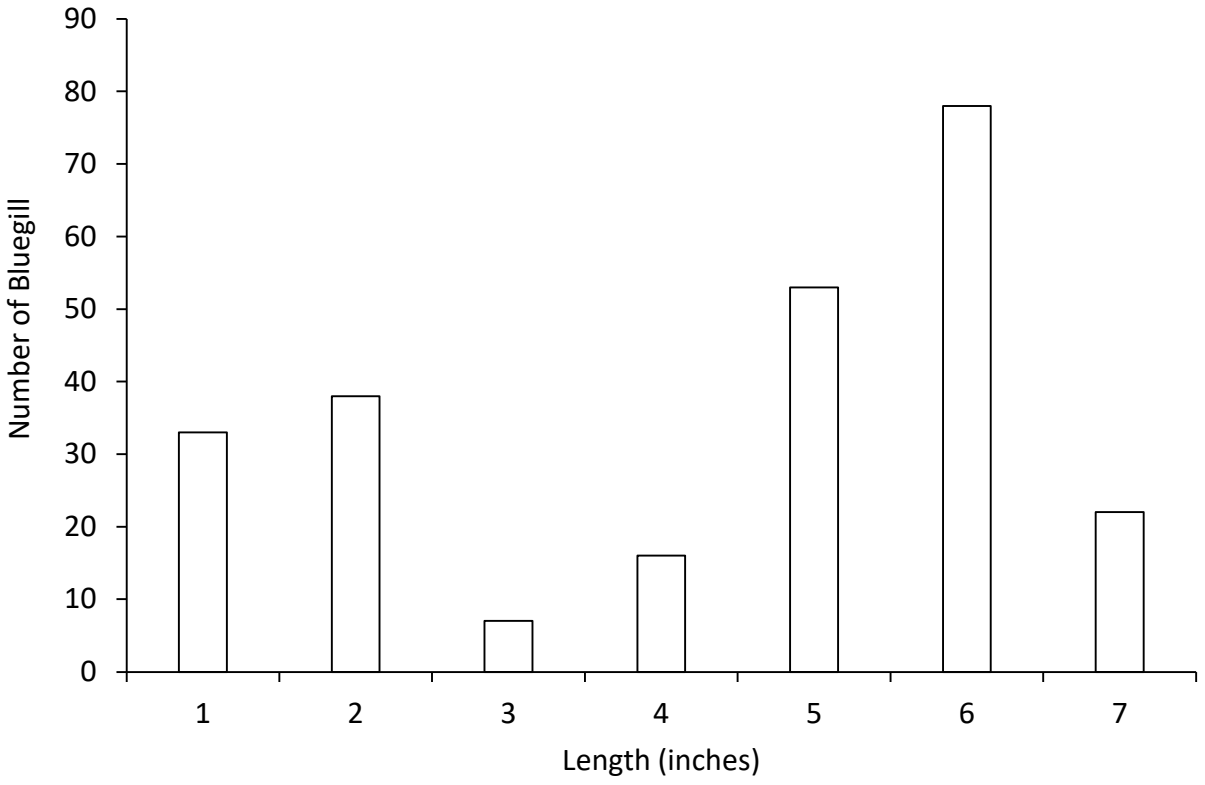

Figure 2. Length frequency distribution of Bluegill captured during the 2021 fall survey on Pratt Lake.

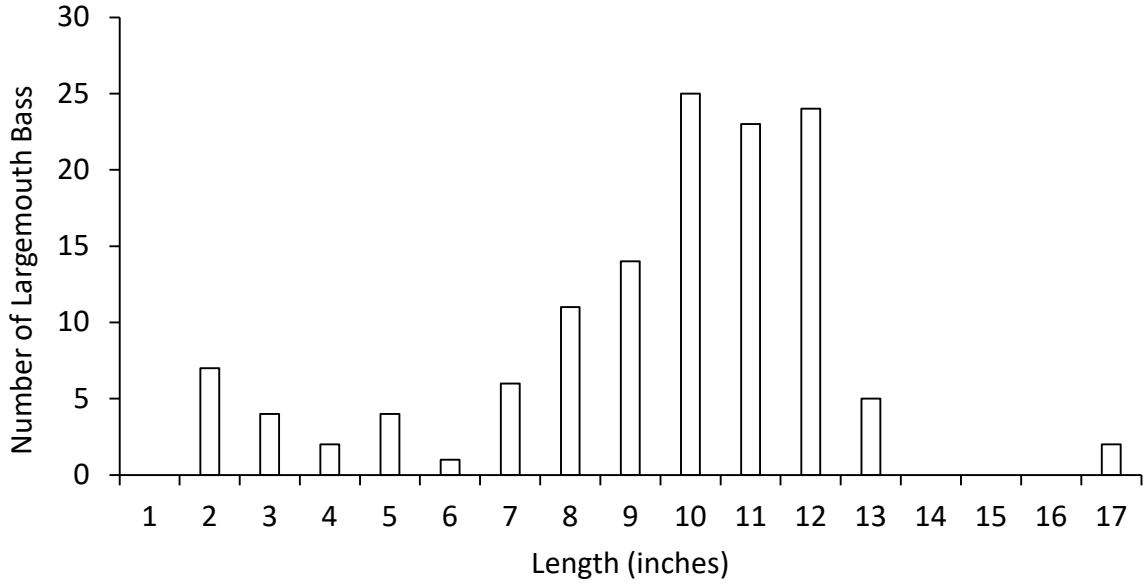

Figure 3. Length frequency distribution of Largemouth Bass captured during the 2021 fall survey on Pratt Lake.

Received December 27, 2022; published February 2, 2023

Brian Gunderman, Unit Review and Approval

Troy Zorn, External Reviewer

Tim Cwalinski, SFR Facilitator

Randall M. Claramunt, Desktop Publisher and Approval