



WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Summary

Boot Lake

Rusk County, Wisconsin, 2022

Introduction

The Wisconsin Department of Natural Resources' (DNR) Fisheries Management Team from Park Falls completed an electrofishing survey in late spring of 2022 to assess the abundance and size structure of Largemouth Bass and Bluegill populations in Boot Lake. We did not repeat the fyke netting that targeted Walleye, Muskellunge, Northern Pike and Yellow Perch in early spring and Black Crappies in the fall of 2012 when we surveyed Boot Lake last time. Quality, preferred, memorable and trophy sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is the team's description for Black Crappie and Yellow Perch 9 inches or longer and Bluegill at least 7 inches long, based on observed angler behavior.

HABITAT AND PUBLIC ACCESS CHARACTERISTICS

Boot Lake is an 87-acre seepage lake located about 8 miles south of Bruce, Wisconsin. It has 2.1 miles of shoreline, an average depth of 17 feet and an intermittent outlet to the DNR's Washington Creek Wildlife Management Area. Boot Lake has a 0.3-acre island and three distinct basins with maximum depths of 24, 39 and 44 feet. About 14% of the surface area is less than 3 feet deep, and 37% is deeper than 20 feet. August Secchi depth measurements averaging 8 feet in 1992-2006 show that the water remains very clear through mid-summer. Judging from symbols on the 1965 lake map, the lake bottom materials appear to be equally distributed between sand and muck. Dense floating vegetation restricts navigation to a narrow corridor from the public boat landing to the middle basin. Those seemingly impenetrable aquatic plants serve as hiding cover for young fish to evade predation and spawning habitat for Muskellunge. Tamarack-spruce bogs predominate the riparian zone, limiting residential development to the shorelands with pines and mixed hardwood near the boat landing and along the south and east shores of the largest basin. In 1999 nineteen fish cribs were installed at depths of 10-15 feet.

SURVEY EFFORT

With water temperature at 58-59°F, our May 26, 2022 electrofishing survey coincided with the early spawning and nest-building activities of Largemouth Bass, Bluegills and Pumpkinseeds. We collected gamefish species along Boot Lake's entire shoreline, sampling 1.99 miles in 0.95 hours and subsampling all fish species for 1.00 mile in 0.52 hours. Low conductivity may have somewhat hampered our electrofishing capture efficiency, even with our electrofishing equipment set to its maximum output.

Results and Discussion

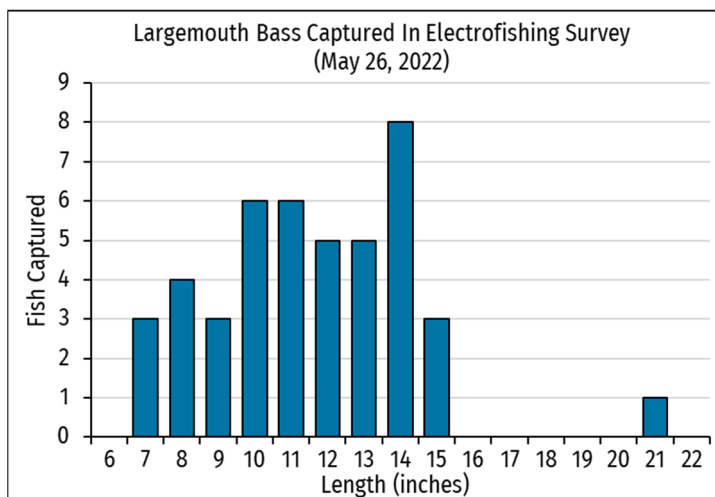
FISH COMMUNITY

Our sample included seven fish species, but we doubt the entire fish community can be properly represented in a single survey that used only one type of collection gear. By

comparison, fyke netting and electrofishing captured eleven species in 2012. Largemouth Bass was the principal predator, and Bluegill was our sample’s most abundant prey fish. In addition to the species discussed below, we also found Golden Shiner, and saw two Muskellunge evading capture. With no passable connection to neighboring waters, the muskies captured or seen in many Boot Lake surveys are likely the natural descendants of large fingerlings introduced between 1966 and 1972. Northern Pike were not found in 15 netting and electrofishing samples collected in Boot Lake from 1995 to 2022. The absence of pike may explain why muskies can sustain a low-density population by natural reproduction. Because Northern Pike eggs hatch several weeks earlier than Muskellunge eggs, age-0 pike are thought to suppress the survival of age-0 muskies by predation or competition where the two species coexist.

LARGEMOUTH BASS

We captured 44 Largemouth Bass ranging from 7.2 to 21.4 inches and averaging 12.0 inches long. Our catch rates of 43 bass \geq 8 inches per hour or 21 per mile suggest that population abundance has moderated somewhat since 2012, when late-spring electrofishing captured 48 bass per hour and 33 per mile. Grouping Largemouth Bass of all sizes, the electrofishing capture rate of 22 bass per mile in Boot Lake ranked between the 25th and 50th percentile among lakes classified as having a “simple” fish community, a “warm” thermal regime, and “clear” water. By comparison, bass catch rates in electrofishing surveys completed in the spring of 2002 and 2012 ranked above the simple-warm-clear category’s median value.

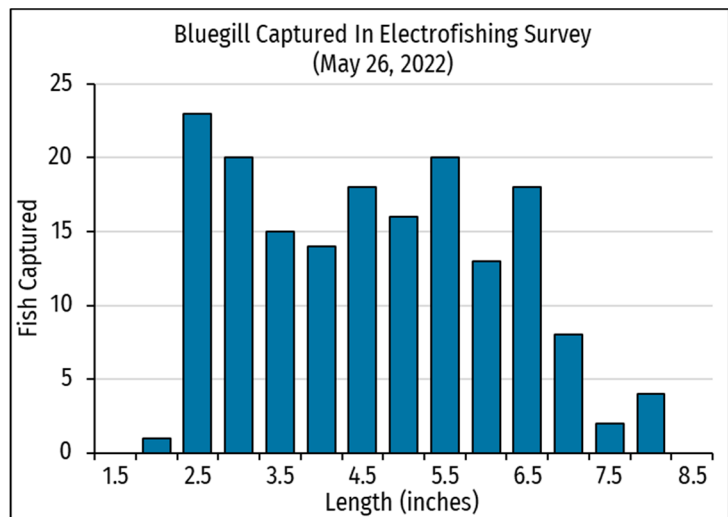


With decreased abundance, the size structure of Boot Lake’s Largemouth Bass population has improved. The average length increased from 10.6 inches in our last survey ten years ago. Likewise, the proportions of quality-size bass \geq 12 inches and preferred-size bass \geq 15 inches rose from 38% and 5% in 2012 to 54% and 10% in 2022. Nearly 30% of bass \geq 8 inches were legal-size fish at least 14 inches long. Our sample included a 21.4-inch, memorable-size fish that ranked third longest among 11,269 Largemouth Bass measured in 224 surveys on Rusk County lakes and streams since 1970.

BLUEGILL

Electrofishing along half of Boot Lake’s shoreline produced a robust sample of 172 Bluegills that ranged from 2.3 to 8.3 inches and averaged 4.8 inches long. Electrofishing catch rates of 148 Bluegills \geq 3 inches per mile and 287 per hour indicate moderately high population abundance. Pooling all sizes, the capture rate of 172 Bluegills per mile ranked between the 50th and 75th percentile among simple-warm-clear lakes, whereas in 2002 and 2012, Bluegill catch rate in Boot Lake was at or below the median value for that lake class.

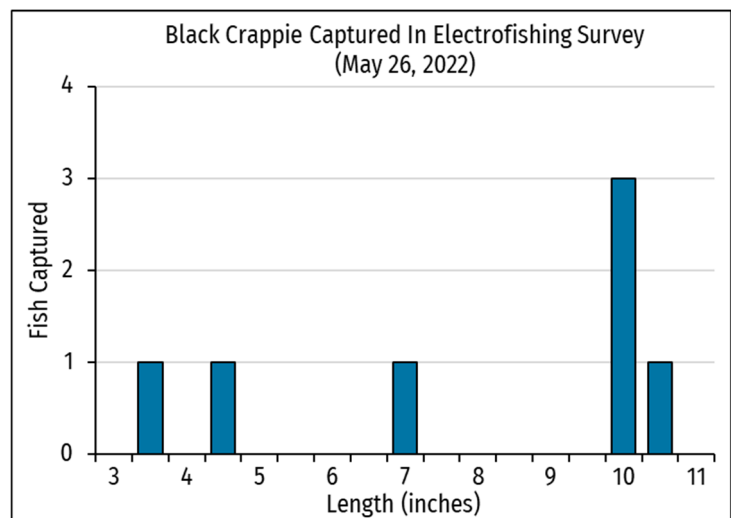
The increase in Bluegill numbers has resulted in lower proportions of quality-size fish ≥ 6 inches, keeper-size fish ≥ 7 inches and preferred-size fish ≥ 8 inches. Proportions of the population in these size groups have decreased from 83%, 57% and 10% in 2012 to 30%, 9.5% and 2.7% in 2022. The average length of Bluegill has also decreased by $\frac{2}{3}$ inch in that period. We suspect that the increased abundance and decreased size of Bluegill result from fewer Largemouth Bass on hand to control Bluegill recruitment by predation. This predator-prey imbalance is compounded by dense submerged vegetation in parts of Boot Lake where young Bluegill can hide from predators.



Indirect indications at the only public boat access suggest Boot Lake does not receive heavy fishing pressure. Currently, Boot Lake anglers may keep a daily bag limit of 25 panfish in any combination of species and size. Unless anglers consistently take the largest Bluegills from the population, further restrictions on panfish harvest would probably not help to improve Bluegill size structure.

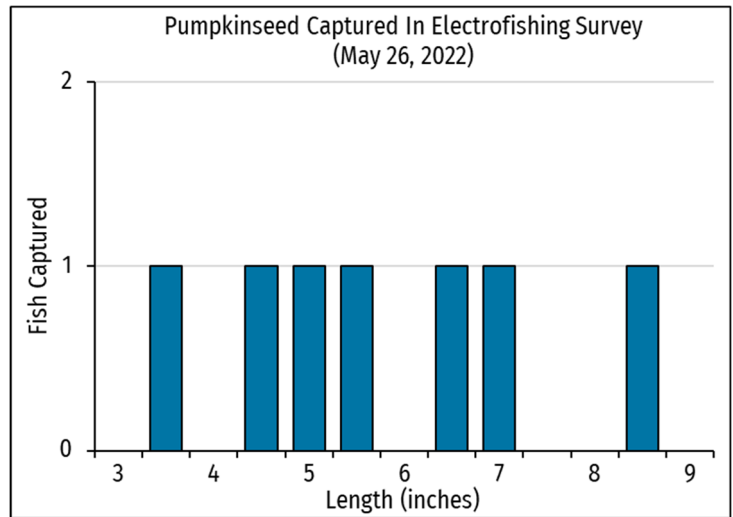
BLACK CRAPPIE

Our electrofishing sample included seven Black Crappies that ranged from 3.9 to 10.6 inches and averaged 8.2 inches long. Electrofishing catch rates of 5.0 crappies ≥ 5 inches per mile and 9.7 per hour suggest that crappie abundance is under control and low enough to keep them growing fast. Though our sample size was small, four of the five crappies ≥ 5 inches grew to 10 inches or longer, the sizes anglers prefer to keep and eat.



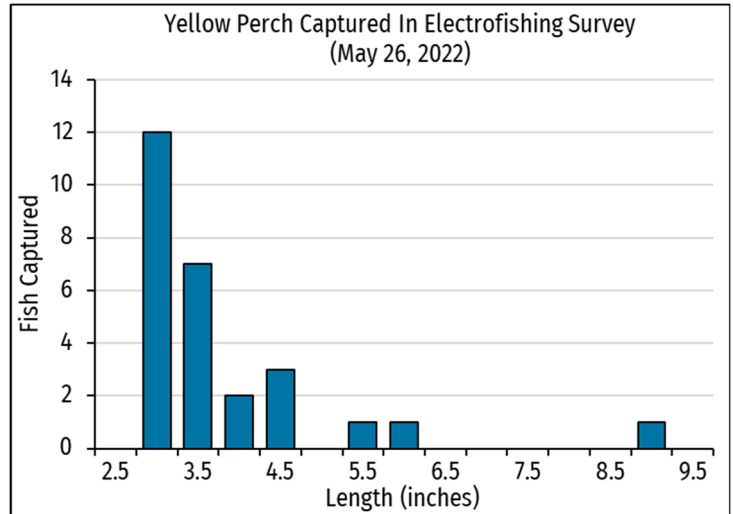
PUMPKINSEED

The seven Pumpkinseeds in our sample ranged from 3.5 to 8.6 inches and averaged 5.9 inches long. The low electrofishing catch rates of seven Pumpkinseeds ≥ 3 inches per mile and 14 per hour represent the low population abundance that grows at least some fish to the preferred size of 8 inches and longer.



YELLOW PERCH

We captured 27 Yellow Perch ranging from 3.0-9.0 and averaging 4.0 inches long. Most were less than 5 inches long, making them suitable forage for Largemouth Bass, but anglers would have a slim chance to catch an acceptable meal. The combined catch rates for all sizes were 27 perch per mile and 52 perch per hour, but we don't know if late-spring electrofishing catch rates can accurately represent perch population abundance.



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