WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Summary
Worcester Lake
Price County, Wisconsin, 2024

Introduction

The Wisconsin Department of Natural Resources' (DNR) Fisheries Management Team from Park Falls completed netting and electrofishing surveys in 2024 to assess the abundance, size structure and reproductive success of important sportfish populations in Worcester Lake. The estimate of adult walleye population density derived from the early spring surveys helped us evaluate the biennial walleye stocking strategy that we initiated in 2019. An electrofishing survey in late spring characterized the status of largemouth bass and bluegill, and fall electrofishing measured natural walleye recruitment. Quality, preferred and memorable 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

Worcester Lake is a 100-acre drainage lake, located about three miles north of Prentice, Wisconsin. Average depth was 12 feet, maximum depth was 37 feet and 10% of the surface area was less than 3 feet deep. An unnamed stream discharges about 1 cubic foot per second to Hay Creek and then to the South Fork Jump River. Lakebed materials near shore were categorized as 57% gravel, 40% muck-silt, 2% rock-rubble and 1% sand. Samples from September 1968 characterized Worcester Lake as a slightly acidic (pH 6.2), soft water lake (methyl purple alkalinity 17 milligrams per liter as $CaCO_3$). Water clarity was moderately high (Secchi depth=7 feet), indirectly indicating its "mesotrophic" or mid-range nutrient concentrations and biomass production rates. Worcester Lake belongs in the class of lakes that have clear, cool water and a complex fish community. Submergent and emergent vegetation persists at moderately high stand density around nearly the entire perimeter through late September. Shoreland vegetation was 35% birch-aspen forest, 62% cedar-spruce-tamarack swamp and 3% leatherleaf bog.

Hackett Township maintains a boat landing with a concrete ramp, boarding dock and ample parking on the southeast shore. Public road access to the boat landing should follow County Highway K and Worcester Lake Road from the east because the road from the south is a private drive with no public thoroughfare. An 835-foot-long channel was excavated landward from the north shore with permit approval granted in 1965. Neither the boat landing, nor the man-made enlargement appears on the 1968 lake map.

SURVEY EFFORT

Our early spring netting survey was unusual in 2024. On March 11, shortly after the ice thawed several weeks earlier than normal, we set four fyke nets at known and likely walleye spawning locations, adding a fifth net after two days. We fished the nets in 24- or 48-hour sets and checked them five times when water temperature ranged from 40 to 43°F. With

overnight air temperatures dropping to single digits, we removed all nets on March 18 before the lake's entire surface refroze. We redeployed the five nets at three repeated sites and two new sites when the ice thawed again on April 8, 2024. In both periods combined, we captured, marked and released spawning walleye in 48 net-nights of fyke netting effort from March 11 to April 11, 2024. We measured or counted all gamefish species encountered in that netting effort, and we measured panfish in 23 net-nights. On April 13, 2024, we targeted mature walleye again by nighttime electrofishing along the entire shoreline, sampling 2.26 shoreline miles in 1.02 hours of electrofishing effort when the water temperature was 50° F. The proportion of marked walleye in our electrofishing survey allowed us to estimate adult walleye density.

With water temperature between 62 and 64° F, our May 28, 2024 electrofishing survey coincided with the early spawning and nest-building activities of largemouth bass and bluegill. We collected gamefish species along 2.15 shoreline miles in 1.03 hours and subsampled all fish species for one mile in 0.47 hours.

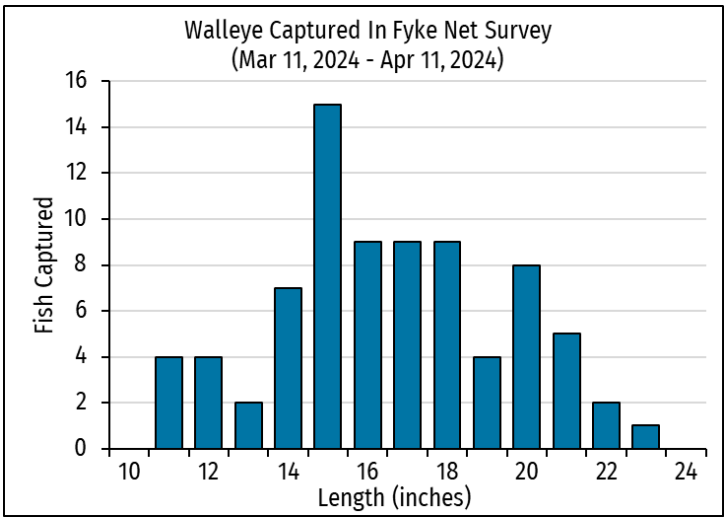
Our October 3, 2024 electrofishing survey targeted young walleye, but we collected all gamefish along 1.85 shoreline miles in 0.82 hours when water temperature was 62° F.

Results and Discussion

FISH COMMUNITY

Though these surveys were not designed to characterize the entire fish community, our combined netting and electrofishing efforts in the spring of 2024 captured 10 fish species, compared to 12 species collected by those methods in 2014 and 2015.

WALLEYE



Early spring fyke netting in 2024 captured 108 walleyes at a rate of 2.3 fish per net-night. That catch rate ranked between the 25th and 50th percentile values among lakes in the complex-cool-clear category. The 79 walleyes captured just once in nets ranged from 11.2 to 23.1 inches and averaged 17.0 inches long. Early spring electrofishing captured 32 walleyes, including 12 that we marked and released in our netting survey. Electrofishing catch rates were 13.5 walleyes ≥ 10 inches per mile or 29.9 per hour. The 20 walleyes not handled before ranged from 6.6 to 20.4 inches and averaged 14.4 inches. From these netting and electrofishing samples, we estimated that Worcester Lake's walleye population had 152 adults (95% confidence interval = 84-220; coefficient of variation = 0.23) or 1.5 adult per acre. Walleye density in Worcester Lake was slightly below the average value of 1.8 adults per acre in populations maintained primarily by stocking in Wisconsin's Ceded Territory. The ratio of males to females in our early spring samples was 2.1.

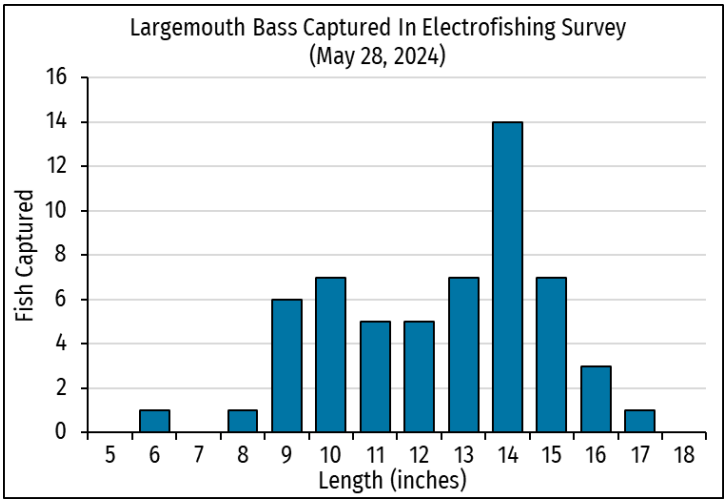
Survey and stocking records show that Worcester Lake once had a walleye population in low to moderate abundance sustained solely by natural recruitment. However, in-lake production no longer adds any young walleye to replace the adults that die to angling and natural causes. We captured no fingerlings in 11 electrofishing assessments of walleye recruitment in the fall of 2006 and 2014 through 2024. We documented the last natural cohort in 2001 when fall electrofishing captured 14 fingerlings per mile. We acknowledge that fall electrofishing surveys may not be sensitive enough to detect very low rates of natural recruitment. Likewise, the walleye population may have produced one or more natural year classes from 2007 to 2013 when no recruitment surveys occurred. With no history of walleye stocking and under a presumption of failing recruitment , Worcester Lake's walleye population served as an "unstocked control lake" for comparison in the DNR's evaluation of the Walleye Stocking Initiative. After five consecutive years with no natural recruitment detected, the DNR began stocking walleyes as a measure to maintain the population. Worcester Lake has received 10 large fingerlings per acre averaging from 6.3 to 7.5 inches long in 2019, 2021 and 2023 for a total of 3,025. Some of the earliest stocked walleyes may be represented in our netting and electrofishing samples from the spring of 2024, but we will evaluate this stocking strategy after three stocked year classes have sufficient time to become fully recruited into the adult population. Our fall electrofishing catch rates ranging from five to eight yearlings per mile in 2020, 2022 and 2024 indicate that the fingerlings stocked in the previous years are surviving and growing to increase walleye abundance in Worcester Lake. In the next surveys scheduled in 2032, we hope to document the ultimate measure of success when the stocked walleyes mature to restore natural recruitment.

Ring counts on sectioned dorsal spines revealed that, on average, males grew to 15.4 inches in four years (range 12.8-17.1; n=19) and 17.3 inches in five years (range 14.8-20.1; n=13). The female walleyes in our aged subsample reached 20.5 inches in five years (range 18.5–23.1; n=18). One 21.9-inch male and one 22.8-inch female were estimated to be 16 years old. In general, males matured at age 4 and females at age 5. We found only one age-3 male and two age-4 females. We noted that the 29 age-4 walleyes in our subsample represent the 2020 walleye year class. However, because no walleyes were stocked into Worcester Lake in 2020, either our age estimates are inaccurate, or a substantial contribution from in-lake production went undetected in our recruitment survey in the fall of 2020. Age estimates from subjective interpretation of bony structures have inherent variation and error. And, we have a consistent record of undetectable recruitment in annual surveys since 2014. Therefore, we believe the former scenario is more likely than the latter.

Based on our age estimates, walleyes grow fast in Worcester Lake. In a pooled sample of all sex categories, their average length at ages 4 and 5 exceeded the 75th percentile values of the complex-cool-clear lake class by 1.0 and 2.8 inches (n=29 and 37, respectively). The mean length of Worcester Lake's walleyes at ages 4 and 5 surpassed the averages for northern Wisconsin by nearly identical margins (0.9 and 2.8 inches). This faster-than-average growth rate, combined with low population density, enables the population to produce higher-than-average proportions of large fish. Seventy-eight percent of walleyes ≥ 10 inches captured in fyke nets were quality-size fish at least 15 inches long and 20% attained preferred size 20 inches or longer. A daily bag limit of three walleyes from 15 inches but less than 20 inches long may be kept, except one of the three may be over 24 inches. Fifty-eight percent of all

walleyes in our fyke net sample were legal-size fish 15-19.9 inches long, but none grew to legal-size over 24 inches yet. For now, we encourage anglers to release the walleyes they catch, at least until the stocked year classes can mature, reproduce and restore natural recruitment.

LARGEMOUTH BASS



In our late-spring electrofishing survey, we captured 57 largemouth bass ranging from 6.8 to 17.4 inches and averaging 12.9 inches long. Our catch rates of 26 bass ≥ 8 inches per mile or 54 per hour suggest that population abundance has changed little since 2015 when late-spring electrofishing captured 35 bass ≥ 8 inches per mile and 62 per hour. Grouping largemouth bass of all sizes, the electrofishing capture rates per mile and per hour both ranked between the 75th and 90th percentile values of the complex-cool-clear lake class. While electrofishing for young walleye in the fall, we incidentally captured nine largemouth bass that ranged from 10.5 to 20.7 inches and averaged 14.0 inches long.

At moderately high abundance, all measures of the largemouth bass population's size structure decreased somewhat since our preceding survey. Their average length dropped nearly an inch from the sample of 72 bass collected by electrofishing in the late spring of 2015. The proportions of legal-size bass ≥ 14 inches and preferred-size bass ≥ 15 inches in spring electrofishing samples decreased from 56% and 37% in 2015 to 45% and 20% in 2024. Compared to other lakes with similar characteristics, the average length of Worcester Lake's bass ranked between the 90th and 95th percentiles of the complex-cool-clear lake class, and the longest bass measured in 2024 ranked well above the 100th percentile value of maximum length in that class. Worcester Lake lies within the Northern Bass Management Zone where anglers may keep largemouth bass from the first Saturday in May through the first Sunday in March. Smallmouth bass may be kept from the third Saturday in June through the first Sunday in March. A daily bag limit of five largemouth bass or smallmouth bass in any combination may be kept, but they must be at least 14 inches long. Smallmouth bass were absent in all recent samples from 2014 to 2024, but 31 smallmouth bass were captured by electrofishing in 1962 and 2001 and by netting in 2006. Angler reports suggest that smallmouth bass may still be present in Worcester Lake at low abundance.

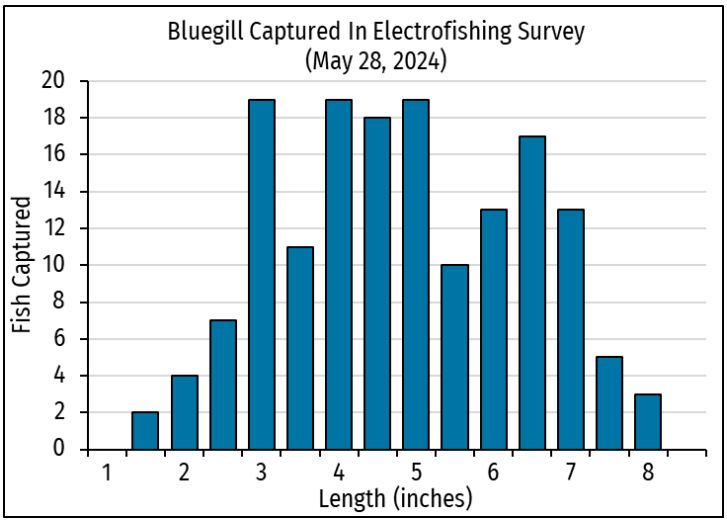
NORTHERN PIKE

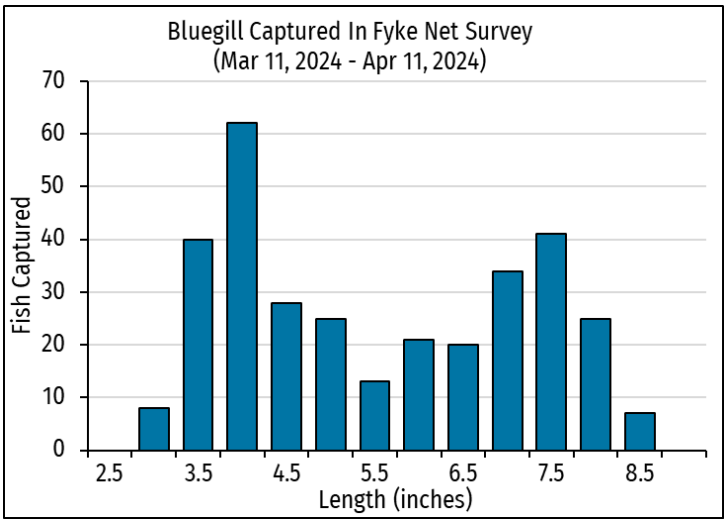
Early spring fyke nets set for spawning walleye incidentally captured eight northern pike at a rate of 0.17 pike per net-night. That catch rate matched the 10th percentile value for northern pike in lakes with clear, cool water and complex fish communities, suggesting low population abundance. The seven pike captured just once ranged from 26.2 to 39.5 inches and averaged 30.7 inches long. Because our netting sample had so few pike, we did not compare the size indices of pike from Worcester Lake with the lake class standards. Anglers may keep a daily

bag limit of five northern pike of any size, and our meager sample suggests that they should be satisfied by the size of the pike they catch.

BLUEGILL

Electrofishing along a mile of Worcester Lake's shoreline in late spring produced a sample of 160 bluegills that ranged from 1.7 to 8.2 inches and averaged 5.0 inches long. The longest bluegill matched the 100th percentile value for maximum bluegill length among complex-cool-clear lakes. Our electrofishing catch rate of 160 bluegills per mile fell just below 75th percentile for the complex-cool-clear class of lakes. Similarly, our catch rate of 343 bluegills per hour ranked just above the 75th percentile value. When compared to lakes with similar characteristics, these catch rates point to moderately high bluegill abundance in Worcester Lake. Their relative abundance is roughly the same as it was in the late spring of 2015 when electrofishing captured 210 bluegills per mile and 338 per hour. Their average length increased by 0.75 inches since our last survey, and the proportion of keeper-size bluegill ≥ 7 inches in spring electrofishing samples increased from 4% in 2015 (n=107) to 14% in 2024. Sometimes, fyke nets can catch the larger bluegills that go undetected in electrofishing surveys. The subsample of 324 bluegills that we measured from 23 net-nights of walleye netting effort ranged from 3.1 to 8.8 inches and averaged 5.8 inches long. The netting subsample had more than twice the share of keeper-size bluegill (33%) than the electrofishing sample had, and 10% of bluegills captured in fyke nets were preferred-size fish at least 8 inches long. Worcester Lake has no special harvest restrictions. Anglers may keep a daily bag limit of 25 panfish of any size and species.

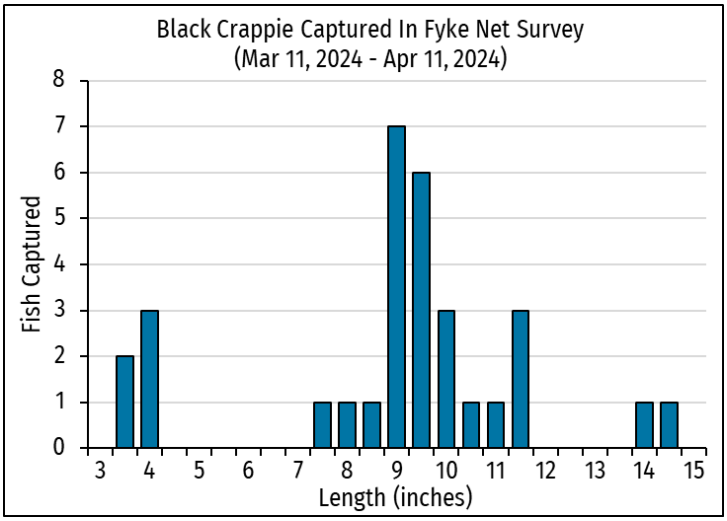




YELLOW PERCH

It has been difficult for us to properly characterize the status of yellow perch populations by our traditional survey methods. In 2024, perch were scarce in all surveys that subsampled panfish. Fyke nets captured four perch and electrofishing captured seven. The longest perch in both samples was 7.3 inches. Perch are the preferred food of walleye, northern pike and largemouth bass, so their abundance and size structure in Worcester Lake may be influenced or controlled by predation. Lucky anglers may find larger perch that evaded our sampling gear.

BLACK CRAPPIE



Twenty-three net-nights of fyke netting effort in the early spring of 2024 captured 31 black crappies that were between 3.9 and 14.8 inches long. Their average length of 9.1 inches ranked between the 95th and 99th percentiles among lakes in the complex-cool-clear category. The longest crappie caught in 2024 ranked between the lake class's 99th and 100th percentile values for maximum length. The fyke netting catch rate of 1.35 crappies per net-night was between the 25th and 50th percentiles, indirectly suggesting that the population has the low to moderate abundance needed to keep individuals growing fast to the sizes anglers like to keep. Currently, 89% of crappies ≥ 5 inches in our netting sample were keeper-size fish at least 9 inches long, 38% attained preferred size 10 inches or longer and nearly 8% reached memorable size ≥ 12 inches. Late-spring electrofishing along 1.0 shoreline mile captured two crappies 6.9 and 7.0 inches long.

Management Recommendations

FUTURE EVALUATIONS

- At an 8-year frequency, the next fishery surveys in Worcester Lake are scheduled in 2032.

WALLEYE

- Continue stocking 10 large walleye fingerling per acre in odd-numbered years through 2029.
- Continue to monitor natural walleye recruitment and early survival of stocked walleyes by measuring fingerling and yearling catch rates in electrofishing surveys completed in the fall of even-numbered years through 2032.
- Estimate adult walleye density again in the spring of 2032.
- Collect fin tissue from a robust sample of walleyes captured in spring of 2032 for parentage analysis to detect low levels of natural recruitment and to determine the relative contributions from stocking and natural reproduction to the adult population.
- In 2032, evaluate the effectiveness of stocking six year classes as a management strategy to restore natural recruitment, not to maintain a put-and-grow walleye fishery.

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