WISCONSIN DEPARTMENT OF NATURAL RESOURCES

# Fishery Survey Summary
# Audie Lake
# Rusk County, Wisconsin, 2023

## Introduction

The Wisconsin Department of Natural Resources' (DNR) Fisheries Management Team from Park Falls completed a late-spring electrofishing survey in 2023 to assess the relative abundance and size structure of largemouth bass, panfish and other gamefish populations in Audie Lake. 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, based on observed angler behavior.

### HABITAT AND PUBLIC ACCESS CHARACTERISTICS

Audie Lake is a 128-acre impoundment located about 13 miles north of Weyerhaeuser, Wisconsin, in the Blue Hills area of Rusk County. The public boat landing can be found at the campground on Perch Lake Road. The construction of a low-head dike raised the water level, flooding and merging several small lakes to form Audie Lake. The present-day impoundment has two intermittent inlets and one intermittent outlet that drains into Perch Lake. The entire shoreline and most of the 700-acre watershed is undeveloped public land. Audie Lake has moderate water clarity (Secchi depth = 5 feet) and low conductivity. Its maximum depth is 32 feet, with an average depth of 6 feet. The lake bottom near the shore is roughly comprised of 40% muck, 30% sand, 15% gravel and 15% rock. The impoundment has an assortment of physical features, including a complex shoreline, many stumps and floating bogs. However, the lake has a history of low dissolved oxygen concentrations and winterkill events. The Rusk County Land and Water Conservation Department operates an aerator in the winter to alleviate low dissolved oxygen concentrations.

### SURVEY EFFORT

On the night of May 17, 2023, we sampled Audie Lake's entire 4-mile shoreline in 2.10 hours of electrofishing effort. We collected and measured all fish species encountered in the initial 2.00 miles in 1.10 hours. We then collected and measured gamefish exclusively in the remaining survey effort. At 63° F, the water temperature was within the optimal range for targeting spawning bass and bluegill by electrofishing in late spring. Low water conductivity, floating bogs and numerous stumps decreased our electrofishing capture efficiency. Even at its highest output setting, the electrical current was insufficient to stun fish, and we watched many flee as we approached. Navigating and dip-netting fish in a maze of submerged stumps and floating bogs further hampered our effectiveness.

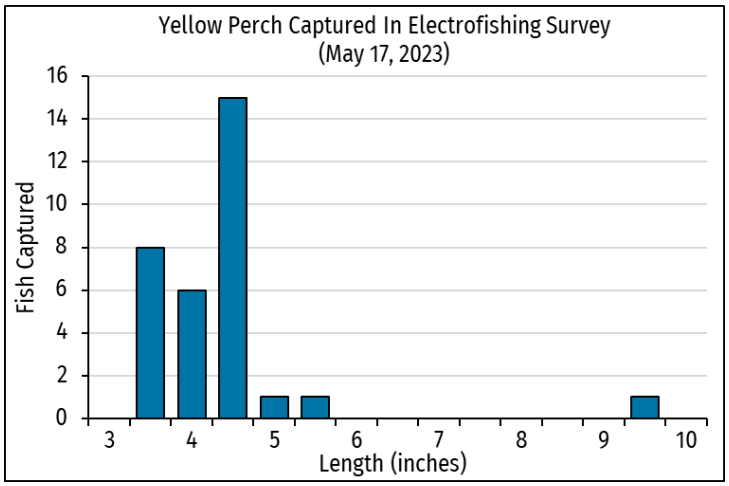
## Results and Discussion

### FISH COMMUNITY

This one-time, single-gear survey certainly cannot represent the entire fish community, but our electrofishing sample can shed light on Audie Lake's fish species composition. We

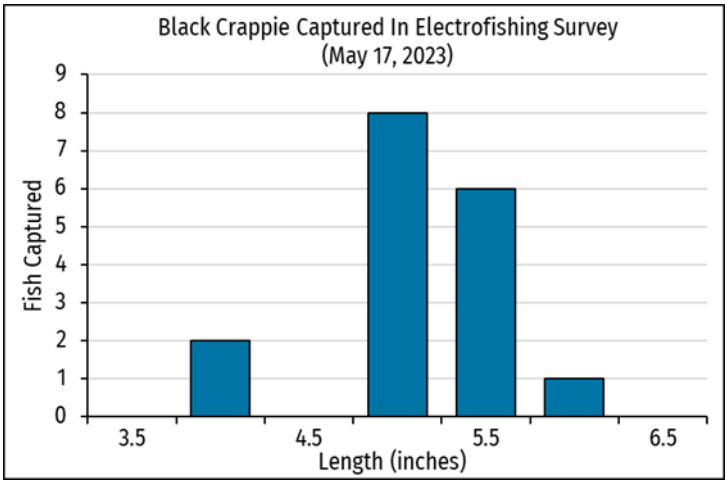
captured six species, mainly yellow perch and black crappie. Our survey results suggest that a recent fishkill occurred, most likely in the winter of 2020-2021, despite operating a lake aeration system to reduce the risk of winterkill. Winterkill can occur when dissolved oxygen is consumed by decomposing plant material and ice cover prevents atmospheric oxygen from replenishing the lake's supply. Lake aeration attempts to maintain an area of open water in winter where fish may seek out better conditions for survival. In general, our 2023 electrofishing sample had fewer fish, fewer species and smaller fish compared to previous surveys. For instance, in 2023, we did not capture bluegill, which was the predominant species in our 2014 electrofishing survey. We did not detect largemouth bass and muskellunge in 2023, even though the DNR stocked 2,817 musky fingerlings from 1972 to 2019.

## YELLOW PERCH




We captured 32 yellow perch ranging from 3.5 to 9.8 inches in our late-spring electrofishing survey, but their average length was only 4.6 inches. Of the three yellow perch sampled over 5 inches, one reached keeper size, but none grew to preferred size ≥ 10 inches. Our catch rate of 16 yellow perch per mile is significantly higher than in previous surveys. We captured only three yellow perch in several netting and electrofishing surveys in the spring and fall of 2004 and 2014. During winterkill events, yellow perch can often tolerate the harsh conditions when other species struggle or die. Sometimes, yellow perch produce large year classes when interspecific competition decreases after winterkill. If some mature perch survived the suspected winterkill to produce one or more strong year classes, perch abundance should increase, and Audie Lake's fish community should eventually recover to offer restored angling opportunities.

## BLACK CRAPPIE




In our late-spring electrofishing survey, we captured 17 black crappies from 4.2 to 6.3 inches long. Their average length was 5.3 inches. Our electrofishing catch rate of 7.5 black crappies per mile decreased by 42% from the same measure of relative abundance in the spring of 2014. The black crappie size structure also decreased since our last survey. The proportion of keeper-size crappies in our spring electrofishing samples decreased from 23% in 2014 to 0% in 2023. Depleted oxygen likely killed many of the population's adults, but enough survived to produce the

2021 year class that we detected. Compared to regional averages, we would expect that most of the crappies in our recent sample were two years old. If, on average, black crappies in Audie Lake grow to keeper size in four to five years, then the population should recover and produce a viable harvest opportunity in 2025 or 2026.

## NORTHERN PIKE

In our survey targeting panfish and bass, we incidentally captured seven northern pike, ranging from 18.3 to 26.8 inches and averaging 21.4 inches long. Although we recorded a modest catch rate of 1.8 northern pike ≥ 14 inches per mile, relative abundance in the pike population could be higher than our electrofishing catch rate indicated. The low water conductivity exacerbates electrofishing gear's already-low efficiency in capturing northern pike. Northern pike can detect the electric output as we approach, and they evade capture quickly. Surveys in 2014 demonstrated the difference between spring fyke netting (the preferred sampling method to represent northern pike population status) and late-spring electrofishing. No northern pike were captured in the 2014 late-spring electrofishing survey while the early-spring fyke netting survey showed a low-density adult population with an impressive size structure. Our contemporary sample exhibits the resilience of northern pike to withstand low dissolved oxygen concentrations or to find refuge with better conditions. As Audie Lake recovers and begins a new cycle, northern pike will continue to be an important predator in the fish community. In recovery, northern pike abundance and maximum length could potentially surpass those of Audie Lake's preceding pike populations if the suspected winterkill serves as a reset button on the fish community. With less interspecific competition from largemouth bass and more yellow perch as their preferred food, the pike population should prosper until the next winterkill occurs.

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