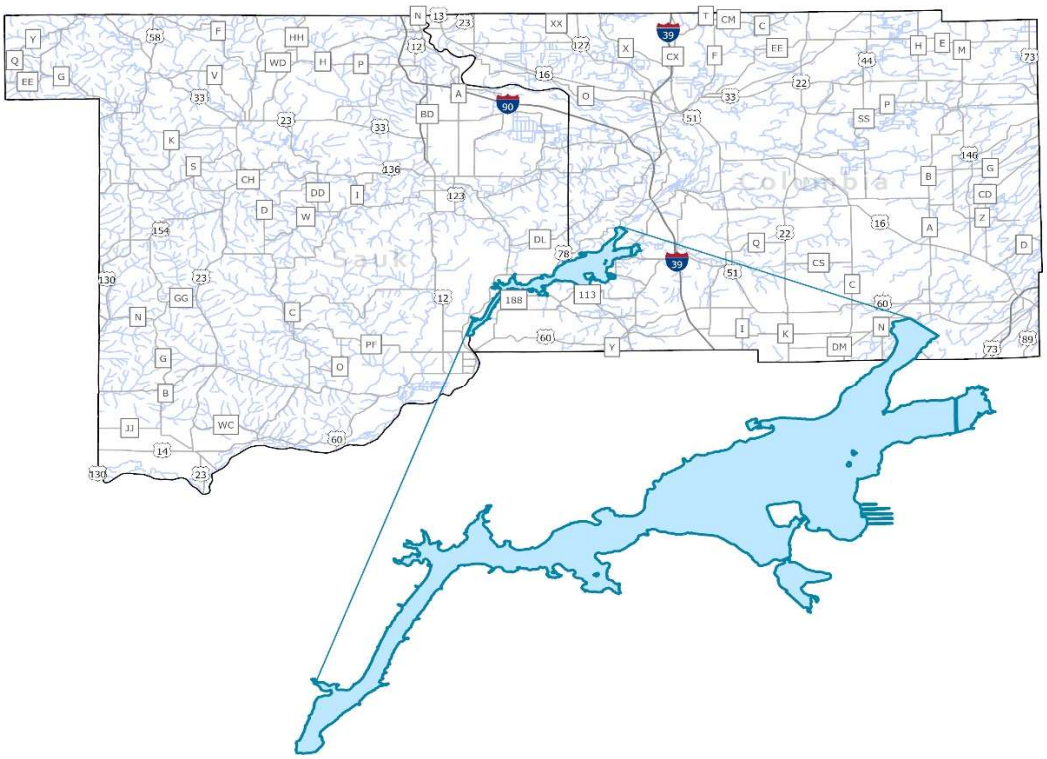
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Comprehensive Fishery Survey of Lake Wisconsin

Columbia and Sauk Counties, Wisconsin 2023



Nathan Nye
DNR Senior Fisheries Biologist
Poynette, Wisconsin
September 2024

Table Of Contents

Executive Summary

A comprehensive fisheries survey was conducted on Lake Wisconsin during the spring and fall of 2023. This included early spring electrofishing for walleye and sauger on the Wisconsin River below the Kilbourn Dam (SE1), fyke netting in the main part of the lake for northern pike (SN1), muskellunge (SN2), late spring electrofishing for bass and panfish (SE2) and a fall electrofishing survey to assess walleye and sauger recruitment (FE). Walleye and sauger were abundant. The 20 to 28-inch protected slot on walleye, sauger, and hybrids provides harvest opportunities for fish 15.0-19.9 inches, good catch and release opportunities for fish 20 to 28 inches, and the opportunity to harvest large walleyes over 28 inches. Walleye growth in Lake Wisconsin was excellent, with fish exceeding 15 inches as early as age 3 and averaging 17.1 inches by age 4. Female walleyes averaged over 20 inches by age 5 while males that exceeded 20 inches were age 9 or older. Walleyes that exceeded 28 inches were age 12 or older. Walleye size structure (PSD values) during early spring electrofishing were down from 2017 and continued a downward trend from 2012 which is reflective of a younger population in 2023. The adult population was dominated by age 3 and age 5 fish from the massive year classes of 2018 and 2020 which came after an extended period of relatively low recruitment.

Panfish species including bluegill, black crappie, white crappie and yellow perch were common and exhibited good growth. Bluegill abundance was moderate for the lake class and bluegills as large as 8.9 inches were collected. Bluegills averaged over 7 inches by age 4 and over 8 inches by age 6, placing bluegill growth ahead of area and state averages, and lake class medians. Bluegill was the only panfish species with consistent annual recruitment, and total annual mortality after age 3 was 81% which was high. Black crappie abundance was on the low side for the lake class and fish up to 14.6 inches were collected in the survey. Black crappie growth rates far exceeded area and state averages, and lake class medians after age 1. Black crappies averaged over 10 inches by age 3, and over 12 inches by age 5 with a maximum age of 13 years. White crappies were collected in slightly lower numbers than black crappies but grew at very similar rates with fish up to 14.1 inches collected, and a maximum age of 8 years. Yellow perch abundance was moderate for the lake class and fish up to 10.7 inches were collected in the survey. Yellow perch growth was good based on local, state and lake class comparisons, but total annual mortality after age 3 was high and the oldest fish sampled were age 6.

Smallmouth bass abundance was high for the lake class and they were more common than largemouth bass and were found in all parts of Lake Wisconsin. Smallmouth bass in Lake Wisconsin showed fast growth in local, state and lake class comparisons with some fish reaching 14 inches as early as age 3 and averaging 14 inches by age 5. Largemouth bass were present in areas of good habitat (shallow bays with aquatic vegetation) but were rare outside those areas. Based on annual fall electrofishing catch rates from 1993-2023, largemouth bass numbers have declined since the mid-2000s. Largemouth bass reached the legal harvest size of 14 inches as early as age 3

and averaged over 14 inches by age 5. Largemouth bass grew faster than area and state average, and lake class medians through age 7.

Northern pike abundance was high for the lake class, and growth was good in local, state and lake class comparisons. Northern pike exceeded 26 inches as early as age 2 and averaged over 26 inches by age 5, with a maximum age of 9 years. Three northern pike over 40 inches were collected with the largest measuring 40.6 inches. Stocked muskellunge were present, but few were collected in the 2023 survey. Low catches in 2023 were consistent with results of surveys in 2012 and 2017.

Additional angling opportunities exist for numerous other gamefish species in Lake Wisconsin including channel and flathead catfish, and white and yellow bass. Also, a healthy naturally reproducing lake sturgeon population provides a month-long hook and line fishery each September. Lake sturgeon harvest from Lake Wisconsin has been very low since 2007 with most anglers practicing catch-and-release.

Future Management Recommendations

1. Continue to conduct the fall walleye and sauger recruitment assessment (electrofishing survey) annually.
2. Reduce the daily panfish bag limit from 25 fish to 10 fish to improve panfish population size structure by reducing harvest.
3. Engage with stakeholders to build support and implement aquatic habitat improvement projects such as fish sticks in the littoral zone of Lake Wisconsin.
4. Continue stocking 2,500 large fingerling muskellunge every other year (even-numbered years).
5. Mark stocked muskellunge with PIT tags to quantify escapement and the corresponding contribution to the muskellunge fishery in the Prairie du Sac Dam tailwater.

General Lake Information
Lake & location

Lake Wisconsin, Columbia County and Sauk County
T9NR6E Sections 12-14, 20-23, 29-31
T9NR7E Sections 6, 7
T10N R6E Sections 25, 36
T10N R7E Sections 1-5, 8-11, 17, 19, 20, 30
T10N R8E Sections 4-9, 17
T11N R7E Section 36
T11N R8E Sections 1, 12-15, 22, 23, 26-35
T11N R8E Sections 4-6
T12N R8E Sections 1-6, 10-12
T13N R6E Sections 3, 4, 10, 13-15, 24, 25, 36
T13N R7E Sections 18, 19, 30-36
T13N R8E Section 31
Waterbody Identification Code (WBIC): 1260600 (Lake Wisconsin) and 1179900 (Wisconsin River)

Physical/chemical attributes

- **Morphometry:** 9,000 acres, maximum depth of 24 feet, 58.2 miles of shoreline (Poff and Threinen 1965)
- **Watershed:** 8,950 square miles, including 485 acres of adjoining wetland (Poff and Threinen 1965)
- **Lake type:** Drainage
- **Water clarity:** Stained and turbid with dense algal blooms in summer and early fall.
- **Littoral substrate:** Muck in shallow bays, sand, gravel, and rock along shoreline of main basin
- **Aquatic vegetation:** Present in shallow bays, largely absent from the main part of the lake due to stained water and depth.
- **Winterkill:** Periodic in shallow bays and elsewhere. Summer kills noted during periods of extreme heat and dry weather.
- **Boat landing:** Approximately 16 public landings around the lake with parking for anywhere from 0 to 25+ vehicles with trailers. Most ramps are paved, and toilet facilities are also available at selected ramps.
- **Other features:** Hook and line fishing is open all year for all fish species except Muskellunge, Lake Sturgeon, trout, Paddlefish, and threatened or endangered fish. Fishing season dates and length and bag limits can be found in Table 1.

Purpose of survey
Baseline lake survey Tier 1 assessment.

Dates of fieldwork

- Fyke netting survey conducted March 20 through March 30, 2023 (SN1)
- Spring electrofishing survey conducted April 4 through April 18, 2023 (Wisconsin River, SE1)
- Fyke netting survey conducted April 18 through April 28, 2023 (SN2)
- Spring electrofishing surveys conducted May 15-May 19, 2023 (SE2).
- Fall electrofishing surveys conducted Oct. 9-October 11 and October 18, 2023 (FE).

Fishery

Panfish: bluegills were common in areas of suitable habitat (shallow vegetated bays). Black crappie and yellow perch were common and assorted other panfish species were present.

Sport fish: sauger, walleye, and smallmouth bass were common. Largemouth bass, northern pike, muskellunge, channel catfish and flathead catfish were present.

Sturgeon: A healthy population of lake sturgeon was present in the lake numbering approximately 1,600 adult fish ≥ 50 inches (Rennicke 2013). Lake sturgeon is the only sturgeon species present in Lake Wisconsin.

Introduction

Lake Wisconsin is an impoundment of the Wisconsin River that was created in 1915, following the completion of the Prairie du Sac Dam (Marshall et al. 1985). The Prairie du Sac Dam is owned and operated by Alliant Energy and provides hydroelectric power generation. The lake is highly eutrophic, receiving elevated levels of nutrient input from the extremely large surrounding watershed of nearly 9,000 square miles, which is primarily agricultural. Algal blooms are common in summer and fall. The lake has the stained water color characteristic of the Wisconsin River, and aquatic vegetation is not common outside of shallow bays due to minimal light penetration (Marshall et al. 1985). The lake is highly accessible to the public and is a popular lake for fishing and other forms of water recreation despite the algal blooms. To address the water quality issues common to the Wisconsin River drainage the Wisconsin River Total Maximum Daily Load (TMDL) study was completed in 2019. A TMDL is the amount of a pollutant that can be present in a waterway while still allowing that waterway to meet its water quality standards.

Within the Wisconsin River Basin, those pollutants are phosphorous and suspended solids. The EPA requires that Wisconsin waters not meeting water quality standards be placed on Wisconsin's 303-d list, and these waters must have a TMDL or comparable water quality restoration plan developed. The Wisconsin River study area included 9,156 square miles across 15 counties, from Vilas County in the north down to Columbia, Sauk, and Dane counties in the south; the entire Wisconsin River

drainage from the headwaters down through Lake Wisconsin, the downstream-most impoundment in the basin. Each waterbody in the study area (streams, rivers, lakes) was assessed to determine pollutant loads stemming from naturally occurring sources (forests, wetlands), runoff from the surrounding landscape including agricultural sources, and runoff from municipal and industrial wastewater sources as well as stormwater runoff. Results of the study will be used to revise current water quality standards and lead to the adoption of new standards with the goal of improving water quality across the entire watershed. For complete information on the Wisconsin River TMDL, please visit the dedicated DNR web page found at https://dnr.wi.gov/topic/tmdls/wisconsinriver/.

The fish community in the lake is characteristic of large impoundments on large northern river systems. Walleye, sauger and smallmouth bass are the dominant gamefish, and are sustained entirely through natural reproduction. Naturally reproducing northern pike are present in the lake, as are stocked muskellunge. Bluegill, black crappie, white crappie and yellow perch provide a robust panfish fishery. Bluegill and largemouth bass are found in good numbers in shallow bays where aquatic vegetation is present, but are rare in deeper, rockier areas of the main body of the lake. Smallmouth bass are abundant in these rocky areas and are sustained through good natural reproduction aided by the lake's connectivity to the Wisconsin River. The river and the lake both provide an abundance of good smallmouth bass habitat.

Although most of the fish populations in Lake Wisconsin are sustained by natural reproduction, some minimal stocking does occur. Tiger muskellunge (northern pike x muskellunge hybrid) were stocked periodically from 1979 through 2002, but these stockings were discontinued in favor of true muskellunge. Muskellunge (all large fingerlings) have been stocked several times between 1972 and 2023, including fish raised by the WDNR, its cooperators and private hatcheries. State-raised muskies are stocked in even years. Lake sturgeon have been periodically stocked into Lake Wisconsin and the Wisconsin River immediately below Kilbourn Dam since 1998. Different sizes of Lake sturgeon have been stocked including fry, small fingerlings, large fingerlings, and yearlings and the stocked sturgeon were produced from gametes collected annually from wild broodstock below the Kilbourn Dam during the spring spawning period. Lake sturgeon stockings occurred only in years when all other quotas were met, and surplus fish were available. Additionally, lake sturgeon have been stocked in the Baraboo River in most years since 2010 as part of a sturgeon rehabilitation program following the removal of the last dam in 2001. The current quota is annual stocking of 500 yearlings and lake sturgeon stocked there have freedom of movement within the Baraboo River and the entirety of Lake Wisconsin. The only other fish stocking that has taken place between the Prairie du Sac Dam and the Kilbourn Dam since 1972 was an unknown number of small fingerling smallmouth bass stocked in 2004 as part of USFWS project to reintroduce Higgins eye pearly mussels in the Wisconsin River. Recent fish stocking records for Lake Wisconsin can be found in Table 2.

Man-made fish structures were added to the lake in September 1987 as part of a DNR-led fish crib project. The cribs were placed at 17 sites around the lake and each unit consisted of five 4-foot by 4-foot wood pallets fastened together and weighted with cement blocks. Twenty units were placed at each site within an area approximately 50 feet in diameter. The goal of placing these cribs was to attract crappies.

Rough fish removals have taken place on Lake Wisconsin periodically since at least 1975. The primary goal was to remove common carp that were having a detrimental effect on the lake. These removals ideally would have a positive impact on the lake. Rough fish removals were conducted by commercial fishermen who annually bid on and were awarded the contract to remove rough fish from the lake, typically using large-mesh (6-inch bar mesh) seines. Contract fishermen have had difficulty seining fish at times because of the amount of submerged timber and debris in the flowage; nets are often damaged or destroyed. The most recent rough fish removal effort occurred in 2015.

The City of Portage, Wisconsin relocated its wastewater treatment plant discharge from the Fox River to the Wisconsin River in 1983, following a process that began in the late 1970s that included an Environmental Impact Statement done by the United States Environmental Protection Agency. After the city began discharging effluent into the Wisconsin River, the Wisconsin Department of Natural Resources conducted its own study during 1983 and 1984 to assess possible water quality impacts from the new discharge. The results indicated that the discharge had no measurable impact on water quality of the Wisconsin River from the discharge point, downstream through Lake Wisconsin (Marshall et al. 1985).

Historically, pollutants from industry located along the Wisconsin River, particularly the paper industry, left the fish in the river with levels of contaminants which rendered them unfit for human consumption, as well as an unpleasant odor which also made them unpalatable. Following the Clean Water Act of 1972, reductions in pollution led to safer fish for eating and eliminated the foul odors which made the fish unpalatable. Harvest of river fish, especially walleyes, increased considerably as a result. A statewide 15-inch minimum length limit for walleyes was enacted in 1990, and in time the size structure of the fishery was reduced as anglers cropped the fish off soon after they reached 15 inches. However, anglers wanted a fishery with larger walleye while still maintaining the ability to harvest fish for eating. Population modeling indicated that increases in the number of walleye larger than 28 inches and sauger larger than 20 inches would be possible under a new regulation. The regulation included a harvest slot from 15 to 19.9 inches and a protected slot from 20 to 28-inches for walleye, sauger, and hybrids. The daily bag limit was 5 fish, one of which could be larger than 28 inches. This regulation was enacted on the Wisconsin River above the Prairie du Sac Dam beginning with the 2002 fishing season. The slot was initially instituted on a temporary basis, with a sunset of 2007. At the 2006 spring

hearings, it was voted on again, and extended until 2014. At the 2013 spring hearings, attendees voted again on the proposal, this time making the rule permanent. On April 1, 2024, the daily bag limit for walleye, sauger, and hybrids on individual inland waters was reduced from 5 to 3, and this change included Lake Wisconsin and the Wisconsin River. The statewide total daily bag limit (for all waterbodies fished in a day) remained 5 fish.

Lake Wisconsin and the Wisconsin River upstream to Wisconsin Dells has a self-sustaining population of lake sturgeon that supports a hook-and-line fishery which runs from the first Saturday in September through September 30 each year. The minimum length limit is 60 inches, the bag limit is one fish per year, anglers must purchase a harvest tag to legally harvest a lake sturgeon, and registration of harvested fish by anglers is mandatory. The population size was estimated at 1,600 adults ≥ 50 inches in 2008, and this was essentially unchanged from the previous population estimate in the early 1980s, despite several years of high harvest prior to the minimum length limit being permanently changed to 60 inches in 2007 (Rennicke 2013). The change to the 60-inch minimum length limit along with a growing catch-and-release ethic among Lake Wisconsin sturgeon anglers has served to reduce harvest to very low levels, despite good availability of harvestable fish. Lake sturgeon in Lake Wisconsin spawn on the fractured bedrock in the Kilbourn Dam tailwater area and this successful natural reproduction sustains the fishery without the need for stocking. Adults from this population are used as the brood stock for hatchery-reared Wisconsin River strain lake sturgeon currently utilized in rehabilitation efforts on the Wisconsin River upstream of Kilbourn Dam, the Baraboo River and the Black River, as well as in lake sturgeon rehabilitation programs in other states. In years when all quotas are filled and surplus Wisconsin River strain lake sturgeon are available, those surplus fish are stocked in the Kilbourn Dam tailwater area where their parents would have spawned naturally.

SURVEY EFFORT

Following ice-out, six fyke nets with 0.7-inch bar, 1.4-inch stretch mesh were set on March 20, 2023; these fyke nets targeted northern pike (SN1). Net frames measured 2, 3 or 4 feet high, depending on the depth of water at each net location. Fyke net locations (GPS coordinates) can be found in Table 3. Nets were added, moved and removed as needed until the final two nets were removed on March 30. Lingering ice coverage in portions of the lake kept the crew from setting nets in some preferred areas. The time that the crew had to spend traveling to multiple access points each day to run the nets also reduced the amount of sampling gear deployed during SN1 and likely the total catch of some species during SN1, particularly panfish.

Past WDNR surveys and anecdotal information from anglers indicated that in early spring, sexually mature walleyes leave the main body of Lake Wisconsin and entered the Wisconsin River to spawn. Because walleye and sauger are not effectively sampled with fyke nets in Lake Wisconsin, early spring walleye and sauger sampling

efforts (SE1) in 2023 were concentrated in the Wisconsin River below the Kilbourn Dam in areas where spawning habitat was judged to be the best. Daytime electrofishing was conducted on April 4, and night electrofishing occurred from April 5-April 18 except for April 15-16. Specific stations were not sampled, but the general sampling area was the Wisconsin River from the Kilbourn Dam downstream to Fisherman's Luck Bar. Only walleye and sauger were collected. Captured walleye and sauger that were 12.0 inches and larger were marked with a top caudal fin clip, while fish smaller than 12.0 inches received a bottom caudal fin clip. Walleye and sauger were measured to the nearest 0.1 inch and sex was recorded when evident. A subsample of five fish per half-inch group for males, females and immature/unknown walleyes and saugers were retained for otolith removal for age and growth analysis.

Eight nets were set in Lake Wisconsin on April 18, marking the beginning of SN2 targeting muskellunge. Net sets focused primarily on locations where muskies were captured in surveys in 2012 and 2017. Nets were run daily from April 19-28, except for April 22 and April 26. Nets were added, moved and removed as needed with the final four nets being removed on April 28 due to low catches and water temperatures reaching the upper 50s.

Gamefish, as defined in Wisconsin Statutes Chapter 29.001 (41), includes all varieties of fish except rough fish and minnows. Panfish are therefore gamefish, and by definition in Wisconsin Statutes Chapter 20.03 (29), panfish includes yellow perch, bluegill, black crappie, white crappie, pumpkinseed, green sunfish, warmouth, and orangespotted sunfish (orangespotted sunfish are not present in Lake Wisconsin). For the purposes of this report, sport fish refers to a subset of gamefish including walleye, sauger, northern pike, muskellunge, largemouth bass, smallmouth bass, channel catfish, and flathead catfish. During fyke netting, all fish were measured to the nearest 0.1-inch and sex was recorded when evident for northern pike, muskellunge, walleye, sauger, and yellow perch. Calcified structures were removed from fish for aging, including otoliths (walleye, sauger, bluegill, black and white crappies and yellow perch), dorsal spines (largemouth and smallmouth bass) and pelvic fin rays (muskellunge, northern pike). The goal was to take structures from five fish per half-inch group, per species except for walleye, sauger, yellow perch, muskellunge and northern pike where the goal was five structures per half-inch group for each sex. Any fish that had an aging structure removed was also weighed to the nearest gram. Muskellunge and flathead catfish were implanted with PIT tags. Walleyes and saugers ≥ 12 inches were marked with top caudal fin clips, and those under 12 inches were marked with bottom caudal fin clips.

A WDNR standard direct current (DC) boomshocker boat was used to sample fish on the nights of May 15-19. Prior to sampling, the shockable shoreline of the lake was divided into 103 half-mile electrofishing stations beginning with Station 1 on the Columbia County shore just above the Prairie du Sac Dam. Stations were numbered

sequentially moving in a counterclockwise direction around the lake with Station 103 ending just above the Prairie du Sac Dam on the Sauk County shoreline. A total of 24 half-mile electrofishing stations were sampled, including six all species stations and 18 sport fish-only stations. Three all species stations and six sportfish-only stations were established index stations that are sampled during every SE2 survey. All other sampling stations were chosen at random from the pool of remaining stations. Common carp were observed and counted when sampling all species stations but were not dip-netted. All gamefish (panfish, sport fish, and other gamefish species) were measured to the nearest 0.1 inch. Aging structures were collected, and weights were recorded as needed to fill out length bins for each species. Starting and ending GPS coordinates for electrofishing stations sampled during SE2 can be found in Table 4.

A WDNR standard direct current (DC) boomshocker boat was used to sample fish in Lake Wisconsin on the nights of Oct. 9-11, 2023 and the Wisconsin River below the Kilbourn Dam on the night of Oct. 18, 2023. Established electrofishing stations have been sampled each year since 1993, including 6 stations in Lake Wisconsin and 2 stations below the Kilbourn Dam; GPS coordinates of the beginning and ending points of fall electrofishing stations can be found in Table 5. The purpose of the annual survey has been to assess walleye and sauger recruitment in Lake Wisconsin and the Wisconsin River, and to monitor trends in populations of other sport fish. All sport fish were collected and measured to the nearest 0.1 inch and muskellunge and flathead catfish were marked with PIT tags.

Methods

In past years, DNR attempted to quantify the size of the spring walleye population in the Kilbourn Dam tailwater area of the Wisconsin River using the multiple-census Schnabel method. However, in 2023 difficult sampling conditions caused by near record high spring river flows limited the walleye and sauger catch. Too few walleyes were marked and subsequently recaptured for calculation of a valid population estimate. The same held true for muskellunge during SN1 and SN2; too few were marked in 2023 to warrant a second round of SN2 sampling (recapture effort) in 2024.

Various data analyses were completed using both Microsoft Excel and R (version 4.2.3) combined with R Studio (version 2023.3.0.0). For all sampling periods, total catch and catch-per-unit of effort (CPUE) was calculated by gear type for all species. Length frequency distributions were generated for gamefish species of interest. Length range, mean and median lengths were calculated for gamefish species as well. Proportional size distribution (PSD), proportional size distribution of fish sizes often acceptable for harvest (PSD-H, either socially acceptable or legally acceptable under current fishing regulations) and proportional size distribution of preferred length fish (PSD-P) were calculated for all gamefish species of interest with more than 100 stock size individuals collected (Anderson and Neumann 1996, Guy et al. 2007). Length designations for stock, quality, harvestable, preferred, memorable and trophy sizes

of the gamefish species collected from Lake Wisconsin can be found in Table 6; these values were used for calculation of proportional size distribution (Anderson and Neumann 1996, Guy et al. 2007). For bluegills, proportional size distribution calculations were reported separately for fyke netting and electrofishing due to possible bias, with fyke nets being selective for larger bluegills (Laarman and Ryckman 1982).

Ages were estimated from calcified structures for a subsample of each species, and age and size data of these fish were used to generate age-length keys and ages were assigned to all fish sampled to estimate the age frequency of the population based on the aged subsample (Isermann and Knight 2005). Age frequency distributions were then generated for each species and inferences were made about year class strength and annual mortality when possible. Catch curves were generated for species exhibiting consistent recruitment for calculation of total annual mortality rates. Mean length-at-age was used to make inferences about growth of fish in Lake Wisconsin by comparing the lake to area and statewide averages and lake class median values. Area averages are calculated from mean length-at-age values from lakes managed out of the DNR Poynette Fisheries office and surveyed from 2011-2023. Area comparisons are helpful for local anglers who are interested in knowing which of the lakes in their home area offer the greatest fishing potential for a certain species. Statewide comparisons help to give anglers a better idea how a given lake compares on a broader scale. Lake class comparisons help anglers understand how a given lake shapes up against other lakes in the state that are the most like that lake.

Lake Wisconsin is classified as Complex-Riverine under the current classification system for Wisconsin Lakes. The Complex-Riverine class includes 183 lakes across Wisconsin (Rypel et al. 2019). Lakes in this classification account for 3% of classified lakes by number and 11% of the total surface area of all classified lakes. Complex-Riverine lakes have four or more sportfish species present, hydrologic retention time less than 15 days, large watershed areas, limited water clarity (low Secchi depth), have walleye and other riverine taxa as primary indicator species and often have common carp present (Rypel et al. 2019).

Mean length-at-age was calculated using methods outlined in Bettoli and Miranda (2001), with the formula listed here:

$$\overline{Li} = (\sum N_{ij}\bar{l}_{ij})/N_i$$

Where $\overline{L}_i$ represents the mean length of the *i*th age group, $N_{ij} = N_j(\frac{n_{ij}}{n_j})$, N_j is the number of fish in the *j*th length group, n_{ij} = number of fish of the *i*th age group subsampled in the *j*th length group, n_j is the number of fish subsampled in the *j*th length group, and $N_i = \sum N_{ij}$ over all *j* length groups. The inputs to this equation are derived from the length frequency distribution of the sample and the age-length key.

Relative weights were calculated to evaluate body condition of fish. Relative weight (W_r) is a tool that compares the length of the fish to an expected weight for that

length. Standard weights were calculated for individuals of each species that had weights recorded and standard weights were only calculated for individuals larger than the minimum recommended length for each species (Murphy et al. 1991, Anderson and Neumann 1996). Relative weights for each fish were calculated by dividing a fish's actual weight by the standard weight for a fish of that length. Average relative weight was then calculated for each species, and for each sex separately when sex data were available. Relative weight values between 75 and 100 indicate normal weight for a given length. A relative weight value greater than 100 indicates that a fish is in excellent condition. A relative weight value less than 75 indicates that a fish is in poor condition.

Results

GENERAL FISH COMMUNITY

In total, 14,202 fish representing 33 species and hybrids from 10 families were collected during spring netting and electrofishing on Lake Wisconsin in 2023 (SN1, SN2, SE2). Additionally, 1,082 walleyes and 85 saugers were collected during spring electrofishing in the Wisconsin River (SE1). Catch and catch rate (CPUE) by gear type for SN1, SN2 and SE2 are shown for each species collected in Table 7. Length, age and relative weight data are summarized in Table 8.

WALLEYE

In total, 1,082 walleyes were sampled during early spring electrofishing in the Wisconsin River including recaptures. The catch rate was 45.5 fish/hour which was quite a bit lower than the 2017 catch rate of 71.3 fish/hour. Catch rates were so low in 2023 because electrofishing conditions were extremely poor due to high river flows during the survey. The flow rates for the Wisconsin River at Wisconsin Dells during the 2023 survey ranged from 29,200 cubic feet per second (cfs) on April 4 to 43,800 cfs on April 17, with an average of 36,475 cfs. By contrast, flow rates ranged from 9,350-17,300 cfs, averaging 13,710 cfs in 2017; the average flow rate during the 2023 survey was nearly 3 times higher than the last survey. For reference, flow rates during the 2017 survey were comparable to historic median flow values for the date range and would have been considered "normal." As a result of the deep water and fast currents in the main channel in 2023, electrofishing focused on flooded bottomlands adjacent to the main channel where currents were slower, the water was shallower and the electrofishing gear was more effective. The flooded bottomland areas were not the preferred spawning areas for walleye and the fish collected there were fish that were moving upriver to spawn and were seeking refuge from the heavy current.

In total, 1,068 unique walleyes were measured during early spring electrofishing (total catch excluding recaptures) and lengths ranged from 6.0 to 30.1 inches with mean and median lengths of 15.8 and 15.0 inches, respectively. The length frequency distribution is presented in Figure 1. The PSD, PSD-P, PSD-M and PSD-28 values in 2023 were 60, 27, 7 and 1 compared to 57, 37, 23 and 3 in 2017. The proportion of fish over 15 inches was basically the same while the proportions of 20, 25, and 28-inch

fish in the catch all decreased since 2017. The 2023 PSD values were also lower than 2012 when PSD, PSD-P, PSD-M and PSD-28 values were 81, 44, 22 and 5, respectively.

Other spring sampling in the main part of Lake Wisconsin yielded a total catch of 452 walleyes including recaptures. The catch rates were less than 0.1 fish/net-night during SN1, 0.6 fish/net-night during SN2 and 34.2 fish/mile during SE2. The 2023 SE2 catch rate was nearly 10 fish/mile higher than the 2017 survey (25.5 fish/mile). The SE2 walleye catch rate in the 9 index stations (stations sampled in every comprehensive survey) was 29.6 fish/mile in 2023 compared to 36.9 fish/mile in 2017. In total 449 unique walleyes were measured during SN1, SN2 and SE2, and lengths ranged from 4.5 to 28.5 inches with mean and median lengths of 11.3 and 9.2 inches, respectively. The length frequency distribution is presented in Figure 2. The PSD, PSD-P and PSD-M values 2023 were 47, 13 and 6, respectively which showed better size structure than 2017 when they were 41, 5 and 1, respectively.

Overall, age-3 walleyes were the most common in the distribution (29.9%) followed by age 1 (26.2%) and age 5 (17.0%). The strongest year classes in spring 2023 corresponded to the strongest year classes seen in the fall recruitment survey in recent years (2018, 2020, and 2022), while relatively weak year classes in 2023 corresponded to relatively weak year classes in the fall recruitment survey (2016, 2017, 2019 and 2021). The overall age frequency distribution is presented in Figure 3. Females grew faster, lived longer and attained larger sizes than males. Very few females were sexually mature at age 3, relatively few were mature by age 4 and nearly all were mature by age 5. Male walleyes matured as early as age 2 and most males were mature by age 3. Numbers of unknown-sex (immature) walleyes declined rapidly after age 3, with few immature fish remaining by age 5. Sex-specific age frequency distributions are presented in Figure 4.

Walleye growth is excellent in Lake Wisconsin, with mean length-at-age values at or above area and statewide averages and lake class median values for all observed ages (Figure 5). Overall, walleyes reached 15 inches as early as age 3 and averaged over 15 inches by age 4. Some walleyes reached the start of the protected slot (20 inches) at age 5 and averaged over 20 inches by age 6. Females averaged 16.5 inches at age 3, 19.3 inches at age 4, and 21.0 inches at age 5. Females that exceeded the upper end of the protected slot (28 inches) were age 12 or older. Male walleyes averaged over 15 inches by age 4. Relatively few male walleyes older than age 5 were sampled, and those that exceeded 20 inches were age 9 or older. Mean length-at-age of female and male walleyes are presented in Figure 6. A von Bertalanffy growth model was fitted to the length at age data (all walleyes regardless of sex), and the result is presented in Figure 7, including the parameter estimates for L_∞ (28.1 inches), k (0.2258904) and t_0 (-0.4412219). The L_∞ value was somewhat lower than the 2017 estimate (34.8 inches) but is probably closer to reality than the 2017 estimate. The next survey in 2028 should seek to sample aging structures from a greater proportion of walleyes over 27 inches than was sampled in 2023. This will help increase precision around the estimate of L_∞.

Condition of walleyes in Lake Wisconsin was good overall based on relative weights, which averaged 91.7 overall for 251 weighed fish. Females averaged 100.9, males averaged 88.1 and unknown sex or immature fish averaged 87.5. Five walleyes (2.0%) had a relative weight ≤ 75 (poor condition), while 53 walleyes (21.1%) had relative weights ≥ 100 indicating excellent condition.

SAUGER

In total, 85 saugers were sampled during SE1 in the Wisconsin River including recaptures. The catch rate was 3.6 fish/hour which was quite a bit lower than the 2017 catch rate of 13.2 fish/hour. Like walleye, sauger catch rates were so low in 2023 because electrofishing conditions were extremely poor due to high river flows during the survey. Other spring sampling in the main part of Lake Wisconsin yielded a total catch of 344 saugers including recaptures. The catch rates were zero fish/net-night during SN1, 0.2 fish/net-night during SN2, and 27.5 fish/mile during SE2. The 2023 SE2 catch rate was nearly identical to the 2017 survey (27.1 fish/mile). The SE2 sauger catch rate in the 9 index stations (sampled in every comprehensive survey) was lower in 2023 (25.8 fish/mile) compared to in 2017 (45.3 fish/mile). The sauger catch rate in randomly selected stations, however, was much higher in 2023 (28.5 fish/mile) compared to 2017 (16.1 fish/mile). In total 430 unique saugers were measured during SE1, SN2 and SE2 and lengths ranged from 4.5 to 19.3 inches with mean and median lengths of 9.3 and 7.5 inches, respectively. The length frequency distribution is presented in Figure 8. The PSD and PSD-P values were 41 and 27. For known-sex saugers, males (n = 45) ranged from 9.2-16.7 inches with mean and median lengths of 11.5 and 11.1 inches, respectively. Female saugers (n = 63) ranged from 12.2-19.3 inches with mean and median lengths of 16.2 and 16.0 inches, respectively.

Age-1 saugers were the most common in the distribution and numbers at age declined steadily thereafter through age 5 with low numbers of age 7 and age 8 fish also present (Figure 9). Age-1 fish were from the best sauger year class on record in 2022, while ages 2, 3 and 5 were from year classes in 2018, 2020, and 2021 that ranged from very good to excellent. The 2019 year class was the weakest year class on record in the annual fall survey and it showed up as being very week as age 4 fish in 2023. Ages 7 and 8 had one fish each in the 2023 sample (females). The age frequency distribution in 2023 was very similar to what was observed in 2017, with the exception that there were a few more fish older than age 5 in 2017 (ages 6 and 7). Sex-specific age frequency distributions are presented in Figure 10.

Females grew faster, lived longer and attained larger sizes than males. Very few females were sexually mature at age 2, with most females reaching maturity at age 3. Females averaged 12.2 inches at age 2, 15.7 inches at age 3 and 17.6 inches at age 5. The single age 7 female measured 19.3 inches and the single age 8 female measured 17.1 inches. Male sauger matured at age 2 when they averaged 10.7 inches. Male sauger averaged over 15 inches by age 4 and no male sauger older than age 5 were sampled. Overall sauger mean length-at-age data are presented in Figure 11, and sex-specific mean length at age data are presented in Figure 12.

A von Bertalanffy growth model was fitted to the length at age data (all sauger regardless of sex), and the result is presented in Figure 13, including the parameter estimates for L_∞ (20.4 inches), k (0.4044733) and t_0 0.1258933). The L_∞ value was somewhat lower than the 2017 estimate (23.2 inches), but it reflects a population with fewer old, large individuals in 2023 than in 2017.

Condition of sauger in Lake Wisconsin was fair overall based on relative weights, which averaged 89.5 overall for 121 weighed fish. Females averaged 99.5, males averaged 84.9 and unknown sex or immature fish averaged 82.1. Eleven sauger (9.1%) had a relative weight ≤ 75 (poor condition), while 16 sauger (13.2%) had relative weights ≥ 100 indicating excellent condition.

BLUEGILL

In total, 10,238 bluegills were collected during the spring; the catch rates were 170.3 fish/net-night during SN1, 5.5 fish/net-night during SN2 and 45.3 fish/mile of shoreline during SE2. The bluegill SE2 catch rate was lower in 2023 than in 2017 (59.8 fish/mile). The SE2 catch rates were lower at both index sampling stations (70.0 vs. 98.7 fish/mile) and randomly selected stations (20.7 vs. 43.1 fish/mile) in 2023 compared to 2017. The 2023 bluegill SE2 catch rate was near the bottom when compared to other lakes in the Poynette management area (19th out of 25; Table 9). However, when compared to other lakes in its class (Complex-Riverine, 183 total lakes), Lake Wisconsin was in the middle of the pack, just above the lake class median (Figure 14). A comparison of size-specific SE2 catch rates among area lakes found Lake Wisconsin in the middle of the pack for the catch rates of 6-inch (14th), 7-inch (11th) and 8-inch bluegills (7th).

Lengths of 1,241 bluegills ranged from 3.4 to 8.9 inches with mean and median lengths of 6.1 and 6.2 inches, respectively. The length frequency distribution for bluegills is presented in Figure 15. The PSD, PSD-7 and PSD-P values from SN1 were 56, 23 and 3, respectively. The PSD, PSD-7 and PSD-P values from SE2 were 63, 19 and 4, respectively. Size structure appeared to be similar but slightly lower in 2023 compared to 2017 when the SN1 PSD, PSD-7 and PSD-P values were 65, 32 and 8, respectively and SE2 values were 49, 26 and 2, respectively.

Ages ranged from 2 to 7 years and bluegills were fully recruited to the sampling gear by age 3 which is typical (Figure 16). Bluegill recruitment appeared to be the most stable of any gamefish species from which age data were collected in 2023 (no missing or overly weak year classes). Application of a catch curve to the data found that total annual mortality was 80.8% after age 3, which is relatively high for the area, indicating high harvest pressure (Figure 17). Bluegill growth in Lake Wisconsin was excellent with mean length-at-age values that were higher than area and statewide averages and lake class medians for all observed ages (Figure 18). Bluegills in Lake Wisconsin averaged over 7.6 inches by age 4, and 8.8 inches by age 6. Growth appeared to be improved with higher mean length-at-age values in 2023 compared to 2017. However, comparisons of mean length at age of bluegills between the 2023 and 2017 surveys are difficult because otoliths were used to age bluegills in 2023 and

scales were used in 2017. Otoliths yield more accurate and precise estimates of age for bluegills than scales do, and comparisons of mean length at age data from two different years using two different structures have limited value.

Overall, bluegills larger than 3 inches were in good condition; relative weight averaged 94.5. Thirty-three bluegills (37.1%) had relative weight values >100 indicating excellent condition, while eleven (12.4%) had relative weight values <75 indicating poor condition. It should be noted that nearly all bluegills with relative weights below 75 were fish smaller than 5 inches. Their recorded weights may have been impacted by erratic readings on the electronic balance during windy or wavy conditions.

YELLOW PERCH

In total, 614 yellow perch were collected; catch rates were 8.7 fish/net-night during SN1, 1.3 fish/net-night during SN2, 4.6 fish/net-night for SN1 and SN2 combined and 9.0 fish/mile during SE2. The SN1 catch rate ranked 3rd out of 16 lakes surveyed in the Poynette management area since 2013. When compared to other lakes in its class across the state, the yellow perch combined catch rate for all netting periods was moderate, placing between the median and 75th percentile for the class (Figure 19). Lengths of 382 measured yellow perch ranged from 4.1 to 10.7 inches, and the mean and median lengths were 6.8 and 6.6 inches, respectively. The yellow perch length frequency distribution is presented in Figure 20. The 2023 PSD, PSD-9 and PSD-P values were 11, 4 and 1 respectively, which was comparable to 2017. Compared to other area lakes surveyed since 2010, Lake Wisconsin ranks just below the middle of the pack in terms of yellow perch size structure when comparing PSD values (Table 10). Female yellow perch accounted for a little over two-thirds of the catch that measured 8 inches or larger. Therefore, the fish that anglers would find acceptable for harvest are predominantly female and this is relatively common across area lakes. Males (n = 142) ranged from 5.2 to 9.9 inches and averaged 6.6 inches while females (n = 167) ranged from 5.7 to 10.7 inches and averaged 7.2 inches.

Overall, yellow perch were fully recruited to the sampling gear by age 2 with a slight difference for females (age 2) vs. males (age 3). Yellow perch recruitment appeared to be inconsistent, with the 2019 year class (age 4) being much weaker relative to other year classes (Figure 21). Application of a catch curve to the yellow perch data was not possible due to inconsistent recruitment and conclusions about mortality are hard to draw. Yellow perch mean length-at-age was at or slightly above area and state averages and lake class medians, with fish averaging 8.0 inches at age 5 (Figure 22). Females grew faster and reached larger sizes than males, averaging 9.3 inches at age 5 compared to 8.0 inches for males.

Overall, yellow perch in Lake Wisconsin were in excellent condition; relative weight values of 134 fish averaged 106.7. Females had a slightly higher mean relative weight compared to males (110.4 vs. 103.1). Three fish (2.2%) had relative weight values ≤ 75 indicating poor body condition, and 46 fish (34.3%) had relative weight values ≥ 100 indicating excellent body condition.

BLACK CRAPPIE

In total, 339 black crappies were collected; catch rates were 2.4 fish/net-night during SN1, 2.2 fish/net-night during SN2, 2.3 fish/net-night for SN1 and SN2 combined and 14.3 fish/mile during SE2. The SN1 and SN2 catch rates were lower than the last survey in 2017 (11.3 and 6.5 fish/net-night, respectively). The SN1 catch rate ranked 11th out of 16 lakes surveyed in the Poynette management area since 2013. The catch rate for SN1 and SN2 combined was low compared to the rest of the lake class, falling just below the 25th percentile for Complex-Riverine lakes (Figure 23). Lengths of 274 black crappies measured in spring 2023 ranged from 3.5 to 14.6 inches and mean and median lengths were 9.4 and 9.0 inches, respectively. The PSD-8, PSD-9, PSD-P and PSD-M values were 73, 57, 55 and 34, respectively and these values were indicative of excellent size structure when compared to other area lakes; Lake Wisconsin was near the top in almost every category (Table 11). Higher PSD-9, PSD-P and PSD-M values in 2023 compared to 2017 indicated better size structure (a higher proportion of large fish in 2023). The black crappie length frequency distribution from the 2023 survey is presented in Figure 24.

Ages ranged from 2 to 13 years with age 2 fish being the most common in the distribution, and ages 10 and 12 not present (Figure 25). Ages 2, 5, and 8 (2015, 2018 and 2021) were obvious strong year classes, while age 4 (2019) was a very weak year class and ages 3, 6 and 7 (2016, 2017 and 2020) were weak relative to the strongest year classes. There were no years of failed recruitment. Alternating weak and strong year classes violated the assumption of constant recruitment, thus application of a catch curve to the black crappie data was not possible and no inferences on annual mortality could be made. Black crappie growth in Lake Wisconsin is the fastest of any lake in the area. Mean length-at-age values for black crappies in Lake Wisconsin were well above area and state averages and lake class medians for ages 2 and older, with fish averaging over 10 inches by age 3 and over 12 inches by age 5 (Figure 26).

Overall, black crappies in Lake Wisconsin were in good condition; relative weight values of 128 fish averaged 102.3. Five fish (3.9%) had a relative weight value ≤ 75 indicating poor body condition, and 55 fish (43.3%) had relative weight values ≥ 100 indicating excellent body condition.

WHITE CRAPPIE

In total, 169 white crappies were collected; catch rates were 1.0 fish/net-night during SN1, 1.8 fish/net-night during SN2, 1.5 fish/net-night for SN1 and SN2 combined and 2.7 fish/mile during SE2. The SN1 and SN2 catch rates were lower than the last survey in 2017 (7.0 and 4.1 fish/net-night, respectively). White crappies aren't as widely distributed across the state as black crappies are, and lake class catch rate metrics were not available for comparison. Among the six lakes in the Poynette management area where white crappies are found, catch rates in Lake Wisconsin were on the low end in 2023. Lengths of 169 white crappies measured in spring 2023 ranged from 4.3 to 14.1 inches and the mean and median lengths were both 9.1 inches. The PSD-8, PSD-9, PSD-P and PSD-M values were 92, 66, 27 and 12, respectively and these values are indicative of good size structure when compared to other area lakes; Lake

Wisconsin is at the top in every category (Table 12). The range of PSD values in 2023 was very similar to 2017 observations except that PSD-12 was notably higher in 2023. The white crappie length frequency distribution from the 2023 survey is presented in Figure 27.

Ages ranged from 2 to 8 years with age 2 fish being the most common in the distribution (Figure 28). Ages 2, 5 and 8 were the strongest year classes (2015, 2018 and 2021) relative to the others, although few white crappies older than age 5 were present. Age 4 was a notably weak year class (2019) compared to other ages through age 5. Variable year class strength violated the assumption of constant recruitment, thus application of a catch curve to the white crappie data was not possible and no inferences on annual mortality could be made. White crappies in Lake Wisconsin exceeded 10 inches as early as age 2, averaged over 10 inches by age 3 and averaged over 12 inches by age 4 (Figure 29). White crappie growth in Lake Wisconsin was better than Lake Redstone, the only other lake in the Poynette management area with good white crappie mean length-at-age data available (more than a handful of scattered year classes).

Overall, white crappies in Lake Wisconsin were in good condition; relative weight values of 88 fish averaged 96.2. Four fish (4.5%) had a relative weight value ≤ 75 indicating poor body condition, and 22 fish (25.0%) had relative weight values ≥ 100 indicating excellent body condition.

NORTHERN PIKE

In total, 282 northern pike were collected including recaptures during the spring of 2023; catch rates were 4.4 fish/net-night during SN1, 0.3 fish/net-night during SN2 and 0.7 fish/mile during SE2. The SN1 catch rate in 2023 was more than double the SN1 catch rate in 2017 (1.9 fish/net-night). The 2023 SN1 catch rate put Lake Wisconsin in the middle of the pack compared to other area lakes and was also above the 75th percentile for the Complex-Riverine lake class (Figure 30).

Lengths of 248 unique northern pike ranged from 9.9 to 40.6 inches, and the mean and median lengths were 22.6 and 21.8 inches, respectively. Mean and maximum lengths in 2023 were similar to values observed in 2017. Female northern pike (n = 94) ranged from 16.8 to 40.6 inches with mean and median lengths of 27.7 and 27.8 inches, respectively. Male northern pike (n = 108) ranged from 9.9 to 33.0 inches and the mean and median lengths were both 19.9 inches. The length frequency distribution is presented in Figure 31. The PSD, PSD-26, PSD-P, PSD-M and PSD-40 values were 62, 36, 29, 8 and 1 in 2023. Overall, northern pike size structure compared favorably with other area lakes; northern pike size structure data are summarized for area populations in Table 13.

Northern pike ages ranged from 1 to 9 years (Figure 32). Northern pike were fully recruited by age 3 with numbers at age declining steadily through age 8. Recruitment appears to be steady based on the lack of any weak or missing year classes. One

exception is that the 2014 year class (age 9) was strong relative to ages 6, 7 and 8 (2015, 2016 and 2017) and likely represents a larger than average year class of pike.

Northern pike mean length-at-age values in 2023 in Lake Wisconsin were at or above the area and state averages and lake class median values for all ages (Figure 33). Female northern pike grew faster than males, averaging over 26 inches by age 3. Some male northern pike exceeded 26 inches by age 3, however males did not average over 26 inches for any age class with a sample size larger than 1. Northern pike mean length-at-age for females and males are presented separately in Figures 34 and 35.

Body condition of northern pike in Lake Wisconsin in 2022 was good; relative weights of 220 fish averaged 98.9. No fish had a relative weight below 75 (poor body condition), and 93 fish (42.3%) had relative weights greater than 100 indicating excellent body condition. Females were in slightly better condition with relative weights averaging 98.8 compared to 91.3 for males.

SMALLMOUTH BASS

In total, 157 smallmouth bass were collected; catch rates were less than 0.1 fish/net-night during SN1, zero fish/net-night during SN2 and 13.0 fish/mile during SE2. The SE2 catch rate in 2023 was markedly higher than 2017 (8.6 fish/mile), but sampling at nine established 0.5-mile index stations found nearly identical catch rates in 2023 (12.4 fish/mile) and 2017 (11.8 fish/mile). Smallmouth bass were found in 20 of 24 SE2 stations sampled in 2023 and the catch rate was well above the 75th percentile for the lake class (Figure 36). Lake Wisconsin was near the top when compared to other area lakes with smallmouth bass populations, ranking 2nd for total catch rate out of nine area smallmouth bass lakes surveyed since 2013. Lake Wisconsin also ranked 2nd in CPUE-7, 3rd in CPUE-11, 2nd in CPUE-14 and 1st in CPUE-17. Size-specific smallmouth bass electrofishing catch rates for area lakes can be found in Table 14.

Lengths of 157 unique smallmouth bass ranged from 4.0 to 19.8 inches, and the mean and median lengths were 12.1 and 11.9 inches, respectively. The length frequency distribution is presented in Figure 37. The PSD, PSD-P and PSD-M values were 69, 26 and 7, but too few smallmouth bass were collected in 2017 to allow meaningful comparisons of smallmouth bass PSD between surveys in 2023 and 2017.

Age 3 was the most common in the distribution (31.6%), with age frequency declining steadily thereafter through age 10 (Figure 38). Recruitment appeared to be relatively consistent based on the age frequency distribution, with perhaps only the 2015 year class (age 8) being stronger relative to adjacent year classes ages 7 and 9). The strong 2015 year class violated the assumption of constant recruitment, preventing fit of a catch curve to the age data and limiting inferences on annual mortality. Smallmouth bass mean length-at-age in Lake Wisconsin was at or above area and state averages and lake class median values for all ages (Figure 39). Some faster growing smallmouth bass exceeded 14 inches in Lake Wisconsin by age 3, but smallmouth bass didn't average over 14 inches (the minimum harvest size) until age 5, consistent

with most other area lakes. Lake Wisconsin mean length at age values in 2023 did not vary greatly from 2017 values, indicating growth has been stable over time.

Condition of smallmouth bass in Lake Wisconsin was good; relative weights of 97 fish averaged 99.3. Two fish (2.1%) had relative weights below 75 indicating poor condition, and 37 fish (38.1%) had relative weights greater than 100, indicating excellent condition.

LARGEMOUTH BASS

In total, 136 largemouth bass were collected including recaptures; catch rates were 1.2 fish/net-night during SN1, 0.2 fish/net-night during SN2 and 4.8 fish/mile during SE2. The SE2 catch rate in 2023 was lower than in 2017 (7.8 fish/mile) and largemouth bass were only found in 8 of 24 electrofishing stations in 2023. The catch rate at nine established index stations was also lower in 2023 (5.1 fish/mile) compared to 2017 (7.1 fish/mile). The 2023 SE2 catch rate was above the median for the lake class (Figure 40); largemouth bass abundance in Lake Wisconsin was consistent with what one should expect to see from lakes of its type. Lake Wisconsin was near the bottom on a local level, ranking 23rd for total catch rate out of 24 lakes surveyed in the Poynette management area since 2011. The catch rate of fish ≥ 8 inches (CPUE-8; stock size) during SE2 was also 4.8 fish/mile, and this ranked 22nd out of 24 area lakes. Lake Wisconsin also ranked 22nd in CPUE-12, 19th in CPUE-14, and 14th in CPUE-18. Rankings for local lakes based on various size-specific largemouth bass electrofishing catch rates can be found in Table 15.

Lengths of 133 unique largemouth bass ranged from 5.3 to 18.0 inches, and the mean and median lengths were 12.2 and 12.4 inches, respectively. The length frequency distribution is presented in Figure 41. Of the largemouth bass ≥ 8 inches in length (stock size), fish ≥ 12 inches were present in good proportion (PSD = 58), as were fish ≥ 14 inches (PSD-14 = 31: legally harvestable) and fish ≥ 15 inches (PSD-15 = 22). Larger bass were less common (PSD-18 = 2). The PSD values in 2023 were slightly lower than in 2017 but still reflect good population size structure.

Age 2 was the most common in the distribution (30.8%), with age frequency declining steadily thereafter through age 11 (Figure 42). Aside from some minor variations in year class strength, recruitment was fairly steady and there were no overtly weak or missing year classes. Age 6 (2017) was probably a slightly weaker year class than normal and age 8 (2014) was probably a slightly stronger year class than normal. This variability was enough to violate the assumption of constant recruitment and prevented fitting a catch curve to the data, thus inferences on annual mortality were limited other than to say generally that harvest (cropping off) doesn't appear to be negatively impacting the population. Largemouth bass mean length-at-age in Lake Wisconsin was at or above state and local averages and lake class median values through age 7 (Figure 43). Some faster growing largemouth bass exceeded the minimum length limit of 14 inches in Lake Wisconsin by age 3, and largemouth bass averaged over 14 inches by age 5. Mean length at age 6 was 16.0 inches, which was close to the value from the previous survey in 2017 (15.5 inches) and ranked 2nd out of

15 lakes surveyed since 2011 where largemouth bass growth data were available (Table 16).

Body condition of largemouth bass in Lake Wisconsin was excellent; relative weights of 89 fish averaged 105. No fish had a relative weight below 75, and 64 fish (71.9%) had relative weights greater than 100 indicating excellent body condition.

OTHER SPECIES OF INTEREST

Other species of interest to anglers that were collected in the survey included pumpkinseed, muskellunge, flathead catfish and channel catfish. In total, 830 pumpkinseeds were collected (mostly during SN1) and lengths of 125 measured fish ranged from 3.6 to 7.5 inches, averaging 5.7 inches. Muskellunge (n = 7) were only caught during SN2 (CPUE = 0.1 fish/net-night) and ranged from 33.7-46.2 inches with mean and median lengths of 37.3 and 35.5 inches, respectively. Muskellunge ages ranged from 4 to 12 years with age 4 and age 6 being the most common (n = 2 each). Flathead catfish (n = 7) ranged from 15.8-42.0 inches, averaging 26.0 inches. Channel catfish (n = 5) ranged from 10.9-31.8 inches, averaging 22.6 inches.

DETRIMENTAL SPECIES

Common carp were collected during SN1 (n = 3; 0.1 fish/net-night), and SN2 (n = 56; 0.8 fish/net-night) and observed and counted in all-species stations during SE2 (n = 10; 3.3 fish/mile). The fyke net and electrofishing catch rates of common carp in 2023 were much lower than the 2017 survey. Common carp lengths were not measured in 2023. Few gizzard shad were collected in 2023 (n = 5 from all sampling periods combined) which was a big change from 2017 when gizzard shad were the second most common fish in the survey by number. A massive die-off of gizzard shad in Lake Wisconsin and the lower Wisconsin River was noted in the late fall of 2022 and through the winter of 2022-23, with the remnants of dead shad visible in most areas of Lake Wisconsin after ice-off in 2023.

FALL ELECTROFISHING SURVEY

Catch, CPUE and length statistics for all species sampled during the fall electrofishing survey are found in Table 17. In total, 1,120 saugers were collected from six sampling stations in Lake Wisconsin during the 2023 fall survey and the electrofishing catch rate was 78.4 fish/mile. Based on the length frequency distribution all saugers smaller than 8.5 inches were considered age 0 (Figure 44). The CPUE for age-0 sauger was 24.1 fish/mile and this was very good, ranking in the 70th percentile of age-0 sauger CPUE values over 31 surveys from 1993 through 2023 (tenth best year class; Figure 45). The top-10 year class of sauger in 2023 comes one year after the best year class on record in 2022 (42.4 age-0 fish/mile) and solid year classes in 2018 (30.0 age-0 fish/mile; sixth best), 2020 (18.3 age-0 fish/mile; 15th best) and 2021 (16.5 age-0 fish/mile, 17th best). The 2019 year class was the worst on record (1.9 age-0 fish/mile). In 2023, 344 age-0 sauger ranged from 4.4 to 8.4 inches in length and averaged 6.9 inches. Overall, sauger lengths ranged from 4.4 to 21.0 inches, with mean and median

lengths of 9.9 and 10.0 inches, respectively. Sauger CPUE-15 was 3.4 fish/mile which was excellent, placing above the 75th percentile of fall catch rates in Lake Wisconsin since 1993 (Figure 46). The 2023 survey also marked the first time since 2008 that a sauger larger than 20 inches was collected in the fall survey; a total of four saugers over 20 inches were collected in 2023.

In total, 117 saugers were collected from two sampling stations below the Kilbourn Dam in Wisconsin Dells in 2023 and the electrofishing CPUE was 34.8 fish/mile. The catch rate of age-0 sauger was 2.7 fish/mile. Sauger lengths ranged from 6.8 to 16.2 inches and averaged 11.8 inches. The length frequency distribution is presented in Figure 47. The CPUE of age-0 sauger at the Kilbourn Dam tailwater has been less variable than for Walleye and has generally been less than 10 fish/mile except for 1994, 1997, 2015, and 2018 (Figure 48). Age-0 sauger CPUE at the Kilbourn Dam tailwater has typically only exceeded 5 fish/mile in years when age-0 sauger CPUE in the main part of Lake Wisconsin was ≥ 30 fish/mile (years with excellent recruitment).

In total, 531 walleyes were collected from six sampling stations in Lake Wisconsin during the 2023 fall survey and the electrofishing catch rate was 37.2 fish/mile. Based on the length frequency distribution all walleyes smaller than 10.0 inches were considered age 0 (Figure 49). The CPUE for age-0 walleye was 18.6 fish/mile in 2023 and this is considered fair, ranking in the 30th percentile of age-0 walleye CPUE values from 1993 through 2023 (tied for 21st out of 31 year classes; Figure 50). The fair 2023 year class followed a good year class in 2022 (33.5 age-0 fish/mile, 12th best), a poor year class in 2021 (17.6 age-0 fish/mile; 24th best), an excellent year class in 2020 (78.2 age-0 fish/mile; 4th best) and a poor year class in 2019 (15.3 age-0 fish/mile; 25th best). The 5-year average for age-0 walleye CPUE was 32.6 fish/mile (2019-2023). Poor year classes in 2019 and 2021 followed near-record year classes in 2018 and 2020. The 2023 fall catch rate of walleyes ≥ 15 inches (CPUE-15) was 7.1 fish/mile, placing above the 75th percentile for all Lake Wisconsin fall surveys since 1993 (Figure 51). The CPUE-20 value was 0.6 fish/mile, placing just below the median for all fall surveys since 1993 (Figure 52). Both the fall CPUE-15 and CPUE-20 values have trended upward over the past couple of years with the large walleye year classes of 2018 and 2020 reaching adult sizes. The 266 age-0 walleyes collected in 2023 ranged from 5.3 to 9.9 inches in length and averaged 7.7 inches. Overall, lengths of 531 walleyes ranged from 5.3 to 27.3 inches and mean and median lengths were 11.1 and 9.9 inches, respectively.

In total, 163 walleyes were collected from the two river sampling stations below the Kilbourn Dam in Wisconsin Dells and the electrofishing CPUE was 48.5 fish/mile. The age-0 walleye CPUE was 19.3 fish/mile and 65 age-0 walleyes ranged from 7.1 to 9.9 inches, averaging 8.5 inches. Overall, walleye lengths ranged from 7.1 to 18.3 inches and averaged 11.4 inches. The length frequency distribution is presented in Figure 53.

Annual age-0 walleye CPUE at the Kilbourn Tailwater sites from 1993-2023 is presented in Figure 54.

In total, 240 smallmouth bass were collected from Lake Wisconsin during fall electrofishing and the CPUE was 16.8 fish/mile. Smallmouth bass CPUE in 2023 placed above the 75th percentile for surveys since 1993 and was among the highest values observed since the early 2000s (Figure 55). The catch rate of legally harvestable fish (CPUE-14) was 2.9 fish/mile which was also high, placing above the 75th percentile for Lake Wisconsin since 1993 (Figure 56). Lengths ranged from 4.1 to 19.2 inches and averaged 11.1 inches. The length frequency distribution is presented in Figure 57. Smallmouth bass catch rates for impoundment sampling stations, although somewhat variable on a year-to-year basis, have been relatively stable over the long term except from 2003-2005 and 2020-2023 when catch rates were noticeably higher.

In total, 119 smallmouth bass were collected from the two river sampling stations below the Kilbourn Dam, and total CPUE was 35.4 fish/mile which was slightly below the median for 1993-2023 (Figure 58). The CPUE-14 was 8.6 fish/mile which was near the 75th percentile (Figure 59). Smallmouth bass catch rates in the Kilbourn Dam tailwater have been variable but steady through time (trending neither upward or downward), with river temperature and flow rate both having an influence on CPUE from year to year. Generally, catch rates are higher when water temperatures are warmer and river flow rates are average to below average. Smallmouth bass lengths ranged from 3.4 to 17.7 inches and averaged 11.8 inches. The length frequency distribution is presented in Figure 60.

In total, 110 largemouth bass were collected from the six sampling stations in Lake Wisconsin, and the electrofishing CPUE was 7.7 fish/mile which was slightly below the median since 1993 (Figure 61). Long-term CPUE data for largemouth bass from the impoundment sampling stations indicated a sharp decrease in abundance followed by a long period of low but stable abundance after abundance peaked in the mid-2000s (Figure 62). The mean CPUE from 2007-2023 (6.9 fish/mile) was less than half of what it was from 1993-2006 (18.1 fish/mile). The catch rate of legally harvestable fish (CPUE-14) was 2.2 fish/mile in 2023, which was slightly above the median since 1993 (Figure 63). Largemouth bass lengths from the fall survey in 2023 ranged from 4.3 to 18.2 inches and averaged 10.9 inches. The length frequency distribution is presented in Figure 64.

In total, only two largemouth bass were collected from the two river sampling stations below the Kilbourn Dam in Wisconsin Dells, and the electrofishing catch rate was 0.6 fish/mile. Lengths of largemouth bass were 14.1 and 15.6 inches. Quality largemouth bass habitat is lacking in the Wisconsin River below the Kilbourn Dam and fall largemouth bass catch rates are generally less than 6 fish/mile. One exception was 2008 (13.7 fish/mile) which was the year that the bank of Lake Delton

caved in along Highway A in early June, causing the entire fishery of Lake Delton to empty into the Wisconsin River in Wisconsin Dells. This amounted to a mass-stocking event for the Wisconsin River and accounts for the temporary spike in largemouth bass catch rates in the river.

Northern pike (n = 9), flathead catfish (n = 3), channel catfish (n = 3), and muskellunge (n = 1) were caught in low numbers in the fall Lake Wisconsin electrofishing survey. Northern pike (n = 4), lake sturgeon (n = 1) and burbot (n = 1) were collected in low numbers during the fall Kilbourn Dam tailwater electrofishing survey.

Discussion

The fish assemblage in Lake Wisconsin includes gamefish species typical of impoundments of large river systems in the upper Mississippi River drainage. In terms of relative abundance based on total catch during SN1, SN2 and SE2, panfish (bluegill, black crappie and yellow perch) were the most abundant fish. Sauger, walleye, northern pike and smallmouth bass were the most abundant sport fish species. Gizzard shad is one of the main forage species in the lake, but shad abundance was down in 2023 compared to the last survey in 2017. Freshwater drum, white and yellow bass, yellow perch, suckers, crappies and other species help to form a robust forage fish community in the lake. All fish populations in Lake Wisconsin are sustained entirely through natural reproduction except for muskellunge which are stocked.

Walleye recruitment was consistently high in Lake Wisconsin prior to implementation of the current walleye regulation in 2002 (20 to 28-inch protected slot) with excellent year classes produced nearly every year. Following implementation of the slot regulation, excellent year classes were produced roughly every 8 years with recruitment ranging from poor to good in between. This is most likely due to a shift in population structure from being dominated by younger smaller fish during an era of high harvest and recruitment (pre-2002) to a population with a significantly higher proportion of the biomass tied up in larger older fish with a corresponding reduction in recruitment. From 2018-2023, good to excellent walleye recruitment was noted every other year (2018, 2020, 2022) which occurred after a period of slow, steady decline in adult walleye abundance. This decline was likely a result of an extended period of relatively low walleye recruitment which included the three worst years of recruitment on record occurring within a 4-year period (2010, 2012, and 2013). Currently, Lake Wisconsin is meeting its walleye recruitment objective with the 5-year age-0 walleye CPUE average comfortably within the recommended range of 16.0-49.0 fish/mile.

Proportions of the walleye population larger than 20, 25 and 28 inches (PSD-20, PSD-25 and PSD-28) in early spring electrofishing surveys of the Wisconsin River have all declined steadily since 2012. Currently Lake Wisconsin is not meeting its PSD-P, PSD-M and PSD-28 objective values of 30, 20 and 2, respectively. The adult walleye

population in 2023 was dominated by relatively young age-3 and age-5 fish from the 2018 and 2020 year classes. As these large year classes enter the protected slot, size structure (PSD values) should improve by the next spring survey in 2028. Angler satisfaction with the walleye fishery should also improve as abundance of adult walleyes in Lake Wisconsin improves. Fall electrofishing catch rates of legally-harvestable walleyes (15.0-19.9 inches) increased sharply in 2022 coinciding with the large 2018 year class reaching adult sizes, and numbers remained strong in 2023. This trend should continue as the large 2020 and 2022 year classes reach adult sizes over the next couple of years. The fall electrofishing survey conducted annually since 1993 has been vital to understanding walleye and sauger recruitment dynamics in Lake Wisconsin, and helps managers accurately predict trends in the adult fishery. It is recommended that the fall walleye and sauger recruitment survey continue on an annual basis.

An angler creel survey was conducted on Lake Wisconsin from July 1, 2022-June 30, 2023 and a second angler creel survey was conducted on the Wisconsin River in the Kilbourn Dam tailwater area in Wisconsin Dells from Sept. 1-30, 2022 and March 1-May 31, 2023 (Nye 2024 in review). Data collected during the creel survey was used to generate statistical estimates of total angler effort (including effort directed at various species), catch, and harvest during the creel period. In both creel surveys, walleye was the most sought-after gamefish species. Angler effort directed at walleyes was 57,393 hours in Lake Wisconsin and 46,247 hours in the Kilbourn Dam tailwater, for a total of 103,640 hours (Nye 2024 in review). Walleyes also had the highest catch of any species, with 34,628 walleyes caught in Lake Wisconsin and 31,027 walleyes caught in the Kilbourn Dam tailwater area. Walleye harvest in Lake Wisconsin (5,231 fish) was second highest after bluegill, and walleye harvest in the Kilbourn Dam tailwater area (4,102 fish) was second highest after white bass. Sauger were also highly sought after by anglers, with the second highest amount of directed angling effort (35,324 hours) and catch (31,916 fish) in Lake Wisconsin behind walleyes. Sauger harvest (5,067 fish) in Lake Wisconsin was third among all species, finishing just behind bluegill and walleye. Directed sauger effort was also second highest among all species in the Kilbourn Dam tailwater creel (21,898 hours) but catch and harvest were both 4th highest (4,217 fish caught, 522 fish harvested).

The importance of walleye and sauger to the recreational fishery of Lake Wisconsin, the Wisconsin River, and the State of Wisconsin in general cannot be overstated. Extensive outreach by the Wisconsin DNR Walleye Management Team combined with the results of recent angler preference surveys determined that Wisconsin anglers value the walleye fishing opportunities available to them statewide, and there was a prevailing sentiment that more should be done to preserve the quality of those opportunities, specifically by limiting walleye harvest (Holsman et al. 2020, Holsman and Scott 2021). After gauging public support statewide through the Wisconsin Conservation Congress (WCC) and DNR spring hearings in 2022 (advisory question) and 2023 (rule change proposal), the daily bag limit for walleye, sauger and hybrids on individual inland waters in Wisconsin was reduced from 5 fish to 3 fish on April 1,

2024. This change included the Wisconsin River. This bag limit reduction without any corresponding change to minimum length limits or fishing season dates was the most supported option discussed during the recent walleye management public outreach efforts and angler preference surveys. It was also the most publicly supported option when managers were deciding how to reduce walleye and sauger harvest in the Winnebago System where a 3-fish daily bag limit was implemented with no change to length limits in 2020.

In an effort to estimate how much the daily bag limit reduction could reduce walleye and sauger harvest, data from 1,097 angling parties interviewed at Lake Wisconsin during the July 2022-June 2023 creel survey and 300 angling parties interviewed at the Kilbourn Dam tailwater of the Wisconsin River during the March 2023-May 2023 creel survey were analyzed to determine how much the 3-fish daily bag limit would have reduced walleye and sauger harvest if it had been in place at the time of the creel surveys. Walleyes and saugers were caught and kept by some angling parties who were not targeting either species, so all percentages below were calculated based on the total number of party interviews, not just interviews from parties that targeted walleyes and saugers. For the Lake Wisconsin creel survey, 667 angling parties targeted walleye, sauger or both species (60.9%). A total of 232 angling parties (21.2%) reported harvesting at least one walleye or sauger and the total walleye and sauger harvest reported by interviewed parties was 735 fish. A total of 43 angling parties (3.9%) harvested more than 3 walleyes per angler during their trip and those parties would have seen their harvest reduced under a 3-bag scenario. The total harvest reduction for those 43 angling parties would have been 96 fish. That reduction represented 12.6% of the total walleye and sauger harvest reported by interviewed angling parties. If that 12.6% harvest reduction were applied to the total estimated walleye and sauger harvest of 10,298 fish during the survey period, the total walleye and sauger “savings” for the year in Lake Wisconsin would have been 1,301 fish, or about 0.2 fish/acre.

For the spring 2023 Wisconsin River Kilbourn Dam tailwater creel survey, 300 angling parties were interviewed and 273 parties (91.6%) targeted walleye, sauger or both. A total of 103 parties (34.3%) reported harvesting at least one walleye or sauger. A total of 9 angling parties (3.0%) would have seen their harvest reduced under a 3-bag scenario, for a total reduction of 23 fish. That reduction represented 7.1% of the total walleye and sauger harvest reported by interviewed angling parties. If that 7.1% harvest reduction were applied to the total estimated walleye and sauger harvest of 4,306 fish during the March-May survey period, the total walleye and sauger “savings” for spring 2023 in the Kilbourn Dam tailwater would have been 313 fish. Considering the range of hypothetical harvest reduction under a 3-fish daily bag limit from these two creel surveys (7.1-12.6%), it is reasonable to expect an annual reduction in walleye and sauger harvest of around 10% in the Wisconsin River between the Kilbourn Dam and the Prairie du Sac Dam (including Lake Wisconsin) under the new regulation.

Panfish are a vital component of the recreational fishery in Lake Wisconsin. The 2022-23 angler creel survey found that collectively, panfish (bluegill, black and white crappie and yellow perch) saw more fish harvested than all other fish species combined, and angler effort directed at panfish was surpassed only by effort directed at walleye and sauger. Panfish were particularly vital to the winter ice fishery in January and February 2023 when panfish accounted for 82.9% of directed angler effort, and 96.1% of all fish harvested.

Bluegill abundance in Lake Wisconsin was lower than many lakes in the Poynette management area but was solidly in the middle of the pack for the Complex-Riverine lake class. Bluegill recruitment was consistent and growth was excellent when compared locally and statewide. However, size structure was only so-so based on PSD values and size-specific electrofishing catch rates. The established management goal for bluegill in Lake Wisconsin is to maintain a balanced population with good size structure. The measurable objective is a PSD between 20 and 60 and a PSD-P between 5 and 20 as outlined in Willis et al. (1993) and Guy et al. (2007). Lake Wisconsin was slightly above the PSD objective (PSD=63) but fell short of meeting the PSD-P objective in 2023 (PSD-P = 4).

The total bluegill annual mortality rate after age 3 was high in 2023, which likely indicated high harvest pressure. The 2022-23 angler creel survey found that bluegills received the 5th most directed angler effort of any species and had the highest total harvest at 8,746 fish. Bluegills also had the highest specific catch rate (0.5 hours per fish) and harvest rate (1.3 hours per fish during ice fishing and 1.5 hours per fish during open water fishing) of any species. The average length of harvested bluegills was 7.2 inches, with 66% of the harvest being larger than 7 inches and 11% of the harvest larger than 8 inches. Bluegills averaged 6.5 inches at age 3 and 7.6 inches at age 4 in 2023, and the sharp drop in numbers-at-age after age 3 correlated well with the fish reaching sizes that anglers most wanted to harvest. Larger bluegills were harvested in far higher proportion than their actual representation in the population based on 2023 PSD values. Data from the fishery survey and the creel survey supported the idea that angler harvest is limiting bluegill population size structure in Lake Wisconsin.

Black crappie abundance appeared to be down compared to the last survey in 2017 and was low for the area and low for the Complex-Riverine lake class. Recruitment was periodic with large year classes produced every three years, with weak year classes in between and no years of failed recruitment. Growth and population size structure were excellent when compared locally and statewide. The 2022-23 angler creel found that black crappies received the 6th most directed effort of all species, and had the 4th highest harvest after walleye, sauger and bluegill with 4,288 fish harvested. The average length of harvested black crappies was 9.5 inches, and black crappies larger than 9 inches were represented in equal or lesser proportion in the harvest than they were in the 2023 fishery survey. Harvest did not appear to be negatively impacting black crappie population size structure in 2023. However

because of the boom-and-bust recruitment pattern in Lake Wisconsin, there is the potential that harvest could impact size structure when abundance is already low due to consecutive years of weak recruitment.

White crappie abundance also appeared to be down compared to the last survey in 2017 and was low compared to the few other area lakes where white crappies are found. White crappie populations are not nearly as widespread in Wisconsin as other gamefish species, and lake class metrics have not been developed to facilitate comparisons. Like black crappies, white crappie recruitment was periodic with large classes produced every three years with weak years in between, and no years of failed recruitment. Growth and population size structure were excellent when compared to other local populations. The 2022-23 angler creel found that white crappies received the 7th most directed effort of all species and had the 5th highest harvest at 2,672 fish. The average length of harvested white crappies averaged 10.1 inches, and crappies between 9 and 12 inches were harvested at a higher rate than their actual representation in the population based on 2023 PSD values. Over time this could be a limiting factor for white crappie population size structure in Lake Wisconsin.

The established management goal for Lake Wisconsin is to provide anglers with a quality crappie fishing experience including the opportunity to catch memorable-sized fish. The measurable objective is to maintain a crappie PSD between 40 and 70, PSD-P between 10 and 40 and PSD-M between 0 and 10. Both crappie species either met or exceeded all size structure objectives in 2023.

Yellow perch abundance was similar in 2023 compared to 2017 based on fyke netting catch rates. Abundance was higher than most lakes in the area, and moderate relative to other lakes in the Complex-Riverine lake class. Population size structure was unchanged from 2017, and Lake Wisconsin is in the middle of the pack relative to other area lakes. Growth was slightly above average, and recruitment was fairly consistent with only one missing year class. The 2022-23 angler creel found that yellow perch received the 8th most directed effort of any species and had the 6th highest harvest at 2,008 fish. The average length of harvested yellow perch was 8.7 inches, and perch larger than 8 inches were harvested in much higher proportion than their representation in the population based on 2023 PSD values. Average growth, limited longevity (maximum age was 6 years) and high harvest pressure all likely play substantial roles in limiting yellow perch population size structure in Lake Wisconsin. Previously it was believed that yellow perch were a relatively minor component of the recreational fishery in Lake Wisconsin, but the results of the 2022-23 angler creel survey suggested that perhaps yellow perch are more important to anglers than previously thought.

High harvest of panfish relative to other gamefish species in Lake Wisconsin combined with evidence that harvest is limiting population size structure for some panfish species is a basis for a regulation change. It is recommended that the daily bag limit for panfish in Lake Wisconsin be lowered from 25 fish to 10 fish. Lowering

the panfish bag limit will reduce harvest and increase the abundance of moderate to large-sized adult panfish, improving population size structure and increasing angler catch rates of larger panfish.

Smallmouth and largemouth bass collectively are an important component of the fishery of Lake Wisconsin, placing behind walleye and sauger and panfish in terms of directed angler effort in the 2022-23 angler creel. Bass anglers most often practiced catch and release and harvest was very low. Smallmouth bass are more abundant and more widespread than largemouth bass in Lake Wisconsin due to the presence of more suitable habitat for smallmouth bass (rock/gravel shoreline) compared to largemouth bass (shallow bays with aquatic vegetation).

Smallmouth bass abundance in 2023 in Lake Wisconsin was high relative to other area lakes as well as other lakes in the Complex-Riverine lake class. Overall, abundance was higher in 2023 compared to 2017 based on electrofishing catch rates during SE2. However, some of the electrofishing stations sampled in 2023 were not sampled in 2017, and when comparing only the stations sampled in both surveys, abundance was essentially the same in both years. Annual fall survey data also indicate that over the past 30 years smallmouth bass abundance has been steady. Smallmouth bass growth was excellent relative to other lakes locally and statewide, and growth has been stable over time. Recruitment was stable except for one super strong year class in the past 10 years.

The 2022-23 angler creel found that while smallmouth bass received the third-most directed angler effort (22,404 hours) and had the 4th highest total catch (20,052 fish), harvest was extremely low (53 fish total). The management goal is to provide anglers a quality smallmouth bass fishing experience through a population with high abundance and good size structure. The measurable objectives are a SE2 catch rate at or above the 75th percentile for the lake class (9.9 fish/mile) as measured at established index stations, with a PSD between 40 and 70 and a CPUE-14 ≥ 2 fish/mile. A secondary objective of CPUE-14 ≥ 1.2 fish/mile during fall electrofishing is included as a means of evaluating size structure annually; 1.2 fish/mile is the median fall CPUE-14 for smallmouth bass in Lake Wisconsin since 1993. Currently all abundance and size structure objectives are being met. The smallmouth bass population is stable and angler harvest is not a threat to abundance or size structure. For these reasons, no regulation change is recommended.

Largemouth bass abundance appeared to have decreased slightly since 2017 and was low relative to other area lakes. Abundance was, however, on par with the rest of the lake class. Recruitment was steady, growth was excellent, and harvest didn't appear to be negatively impacting the population based on 2023 survey data. This was supported by the 2022-23 angler creel which found that while largemouth bass received the fourth most directed effort of any species (21,230 hours) and had the 6th highest total catch (11,734 fish), harvest was very low (442 fish total). The management goal is to maintain a largemouth bass population with abundance comparable to

other lakes in the Complex-Riverine lake class with good size structure. Specific measurable objectives are a total SE2 catch rate ≥ 3.7 fish/mile (lake class median) with PSD between 40 and 70, PSD-P between 10 and 40, and PSD-M between 0 and 10 (Willis et al. 1993). Currently, all abundance and size structure objectives are being met and there are no management changes needed for largemouth bass.

There is room for improvement, however. Data collected during fall electrofishing surveys indicate an overall trend of decreasing largemouth bass abundance since 1993, and an acceleration of the decline after 2006. As noted in the 2017 survey report (Nye 2020), losses of large woody habitat, increasing riparian development, declines in water clarity and quality due to excessive nutrient inputs, declines in aquatic macrophyte abundance and increases in gizzard shad abundance (competition with age-0 largemouth bass) have all likely contributed to the decline in abundance of largemouth bass. Installation of fish sticks or tree drops were recommended as a means of increasing the amount of coarse woody habitat in in the littoral zone of Lake Wisconsin which should improve bass habitat by replacing similar habitat lost over time due to shoreline development. It was noted that such an effort could only be accomplished through partnerships with Alliant Energy (owner of the lake bottom and extensive tracts of riparian land) as well as the stakeholder groups like the Lake Wisconsin Alliance and county or other local units of government. Recommendations for improving habitat for bass (and other species) set forth in the 2017 survey report are no less relevant today than they were then and should remain a focus for managers and stakeholders alike moving forward.

Northern pike were sampled far more effectively in 2023 compared to surveys in 2012 and 2017. Staff were able to target pike during peak spawning time at Whalen's Grade (near the mouth of Rowan Creek) using equipment that was well suited to the habitat (2-foot frame fyke nets). Ice cover on part of the lake prevented access to the preferred netting area from public boat landings, and the crew utilized a smaller aluminum boat that could be launched from the shore, and was equipped with a 2.5 horsepower motor. Use of a smaller, more portable craft for netting operations should be employed in future surveys if ice cover prevents access to netting areas from public boat landings, a common occurrence at Lake Wisconsin. Northern pike abundance was moderate for the area and high for the lake class. Recruitment was steady, with no missing or weak year classes and the occasional exceptionally strong year class. Growth and population size structure were good, and there was nothing to indicate negative impacts to abundance or size structure from harvest.

The 2022-23 angler creel supported the idea that northern pike are a minor component of the recreational fishery. Northern pike had the 10th highest amount of directed angling effort (2,730 hours) and had the 12th highest catch (940 fish). Harvest was low at only 17 fish for the year. Northern pike are doing well in Lake Wisconsin thanks to abundant spawning habitat found near the many large, cold-water creeks that flow into the lake. Those creeks can also provide thermal refuge during periods of extreme heat. A diverse and abundant forage base fuels good growth of pike and

contributes to the potential of the lake to produce fish over 40 inches in length. Population goals and objectives have not been established for northern pike in Lake Wisconsin and based on results of the 2023 fishery survey and 2022-23 angler creel, there is no need to establish goals and objectives at this time. No management changes are needed for northern pike and monitoring of the species should continue during future SN1 surveys.

The muskellunge fishery in Lake Wisconsin is sustained entirely through stocking. However, muskellunge continue to be a difficult species to sample in Lake Wisconsin. Fyke net catches were low again in 2023, as they were in 2012 and 2017. One is left to assume that muskellunge abundance in Lake Wisconsin is low. Recent creel surveys seemed to indicate limited interest from anglers. The 2022-23 angler creel found that there was some directed musky effort in Lake Wisconsin (1,392 hours), as well as some catch (105 fish). No harvest was recorded during the creel. Additionally, no directed muskellunge angling effort, and no catch or harvest were reported during the Kilbourn Dam tailwater creel survey in September 2022 and March-May 2023. It should be noted that two-thirds of the spring portion of the tailwater creel survey occurred during the closed season for muskellunge, so limited angling effort is not surprising.

Recent anecdotal accounts from some muskellunge anglers indicate they target the species frequently in the 30-mile segment of the Wisconsin River between Lake Wisconsin and Wisconsin Dells. Our spring sampling methods, specifically fyke netting, don't target those areas so if fish are utilizing the river more than the lake, our surveys won't do a good job of documenting them. Additionally, we know that good numbers of muskellunge leave Lake Wisconsin via the Prairie du Sac Dam spillway and inhabit the tailwater area below the dam. The Prairie du Sac Dam tailwater area is a very popular destination for local musky anglers (Sims et al. 2022). Musky escapement from impoundments is a common issue faced by fishery managers. The lower Wisconsin River isn't stocked with muskellunge, so the assumption is that the fish found in the tailwater area passed downstream from Lake Wisconsin. Despite our inability to document the status of the muskellunge fishery in Lake Wisconsin using standard survey methodology, it does appear that fish stocked there sustain locally popular muskellunge fisheries. For that reason, it is recommended that muskellunge stocking continue in Lake Wisconsin at the rate 2,500 fall fingerlings every other year (2,500 is the cap for large waterbodies). To document the contribution of fish stocked in Lake Wisconsin to the tailwater fishery below Prairie du Sac Dam, it is recommended that at least a portion of the muskellunge stocked in Lake Wisconsin be marked with Passive Integrated Transponder (PIT) tags prior to stocking. This has not been done in the past but would likely confirm that muskellunge stocked in Lake Wisconsin do not go to waste, and they support viable recreational fisheries in other parts of the river.

White bass, channel catfish and flathead catfish were collected in low numbers during the 2023 fishery survey because they aren't very vulnerable to the sampling

gear used (fyke nets, electrofishing). It should be noted, however, that these species do have some importance in the overall recreational fishery, especially white bass. The 2022-23 angler creel survey of Lake Wisconsin found that white bass (2,939 hours), channel catfish (2,613 hours) and flathead catfish (1,677 hours) all had moderate amounts of directed angling effort relative to other species. Catch was highest for white bass (5,162 fish), followed by channel catfish (1,251 fish) and flathead catfish (290 fish). Harvest was highest for white bass (1,287 fish) and harvest was less than 100 fish for each catfish species.

White bass were very popular in the Kilbourn Dam tailwater fishery. White bass had the third highest amount of directed angler effort in the tailwater creel survey (8,355 hours) after walleye and sauger and had the second highest total catch (9,683 fish) after walleye. White bass had the highest harvest of any species (7,386 fish). Most white bass angling effort (76.7%), catch (76.8%) and harvest (89%) in the tailwater occurred during May 2023 which coincided with their spring spawning run in the Wisconsin River. Despite their seasonal popularity, the white bass population in Lake Wisconsin appears to be doing fine, and no species-specific management goals or objectives are necessary. No regulation changes for white bass (or the similar yellow bass) are recommended.

Future Management Recommendations

1. Continue to conduct the fall walleye and sauger recruitment assessment (electrofishing survey) annually.
2. Reduce the daily panfish bag limit from 25 fish to 10 fish to improve panfish population size structure by reducing harvest.
3. Engage with stakeholders to build support for, and implement aquatic habitat improvement projects such as fish sticks in the littoral zone of Lake Wisconsin.
4. Continue stocking 2,500 large fingerling muskellunge every other year (even-numbered years).
5. Mark stocked muskellunge with PIT tags to quantify escapement and the corresponding contribution to the muskellunge fishery in the Prairie du Sac Dam tailwater.

Acknowledgements

Numerous staff from multiple DNR bureaus assisted the author with field surveys, including Casey Weber, Clayton Roberts, Andrew Notbohm, David Rowe, Bradd Sims, Vincent Schmitz, Kimberly Kuber, Weston Matthews and non-DNR volunteer Michael Rennicke. Fisheries Technicians Casey Weber and Clayton Roberts were instrumental in completing age structure preparation and age estimation. Mallory Johnson, Internal Services GIS specialist, provided the map on the cover page. Fitchburg Fisheries Team Supervisor David Rowe, South District Fisheries Supervisor Tim

Simonson and Communications Specialist Claire Gaber reviewed this manuscript and provided vital feedback which made this a strong report. Thank you all.

References

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D.W. Willis editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Bettoli, P.W., and L.E. Miranda. 2001. Cautionary note about estimating mean length at age with subsampled data. North American Journal of Fisheries Management 21: 425-428.

Guy, C.S., R.M. Neumann, D.W. Willis, and R.O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

Holsman, R., L. Bradshaw, and D. Rowe. 2020. A profile of behaviors and management preferences of anglers who fish in south central Wisconsin. Wisconsin Department of Natural Resources Fisheries Management Report 158. Madison, WI, 26pp.

Holsman, R., and A. Scott. 2021. Angler opinions about walleye fishing and management in Wisconsin. Wisconsin Department of Natural Resources Fisheries Management Repoort 159. Madison, WI, 49pp.

Isermann, D.A., and C.T. Knight. 2005. A computer program for age-length keys incorporating age assignment to individual fish. North American Journal of Fisheries Management, 25: 1153-1160.

Laarman, P.W., and J. R. Ryckman. 1982. Relative size selectivity of trap nets for eight species of fish. North American Journal of Fisheries Management 2: 33-37.

Marshall, D., R. Last, and D. Moran. 1985. Impacts of the Portage wastewater treatment facility on the water quality of the Wisconsin River and Lake Wisconsin. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Murphy, B. R., D. W. Willis, and T. A. Springer. 1991. The relative weight index in fisheries management: status and needs. Fisheries 16(2): 30-38.

Nye, N. 2020. Comprehensive fisheries survey of Lake Wisconsin, Columbia County and Sauk County, Wisconsin 2017. Wisconsin Department of Natural Resources, Madison, Wisconsin. 77pp.

Nye, N. 2024. Lake Wisconsin and Wisconsin River 2022-2023 Creel Survey Report, Columbia County and Sauk County. Wisconsin Department of Natural Resources, Madison, Wisconsin. 38pp.

Poff, R., and C. W. Threinen. 1965. Surface water resources of Columbia County. Wisconsin Conservation Department, Madison, Wisconsin.

Rennicke, M. 2013. Lower Wisconsin River/Lake Wisconsin Lake Sturgeon Annual Update-2013. Wisconsin Department of Natural Resources, Madison, Wisconsin. 26pp.

Rypel, A.L., T.D. Simonson, D.L. Oele, Joanna D.T. Griffin, T.P. Parks, D. Seibel, C.M. Roberts, S. Toshner, L.S. Tate, and J. Lyons. 2019. Flexible classification of Wisconsin lakes for improved fisheries conservation and management. Fisheries 44(5) 225-238.

Sims, B., D. Walchak, and M. Trow. Wisconsin River Creel Survey of the Prairie du Sac Dam Tailwater Fishery 2020-2021. Wisconsin Department of Natural Resources, Madison, Wisconsin. 40 pp.

Willis, D. W., B. R. Murphy, and C. S. Guy. 1993. Stock density indices: Development, use, and limitations. Reviews in Fisheries Science 1(3): 203-222.

Wisconsin Department of Natural Resources. 2019. Total Maximum Daily Loads for Total Phosphorous in the Wisconsin River Basin. Final U.S. EPA Approved Report. Wisconsin Department of Natural Resources, Madison, Wisconsin. 120pp.

Tables

Table 1. Fishing regulations for Lake Wisconsin, Columbia County and Sauk County, Wisconsin in 2023.

SPECIES	SEASON DATES	LENGTH AND BAG LIMITS[1]
Catfish	Open All Year	No minimum length limit and the daily bag limit is 10.
Panfish (bluegill, pumpkinseed sunfish, crappie and yellow perch)	Open All Year	No minimum length limit and the daily bag limit is 25.
Largemouth bass and smallmouth bass	Open All Year	The minimum length limit is 14" and the daily bag limit is 5.
Northern pike	Open All Year	The minimum length limit is 26" and the daily bag limit is 2.
Muskellunge	First Saturday in May through December 31	The minimum length limit is 50” and the daily bag limit is 1.
Walleye, sauger and hybrids	Open All Year	The minimum length limit is 15" but fish from 20 to 28” may not be kept. The daily bag limit is 5 and one fish may be over 28”.
Bullheads	Open All Year	No minimum length limit and the daily bag limit is unlimited.
Rough fish	Open All Year	No minimum length limit and the daily bag limit is unlimited.
Lake sturgeon	First Saturday in September through September 30	The minimum length limit is 60” and the season bag limit is 1.

1. At the time of the 2023 survey, the daily bag limit for walleyes at Lake Wisconsin was 5 fish. On April 1, 2024, the daily bag limit for walleye, sauger, and hybrids was reduced from 5 fish to 3 fish on inland waters statewide.

Table 2. Stocking history for Lake Wisconsin, Columbia County and Sauk County, Wisconsin 2008-2023.

YEAR	SPECIES	STRAIN	AGE CLASS	NUMBER STOCKED	AVERAGE LENGTH (INCHES)	SOURCE TYPE
2008	MUSKELLUNGE	UPPER WISCONSIN RIVER	LARGE FINGERLING	1,250	10.7	DNR HATCHERY
2011	MUSKELLUNGE	UNSPECIFIED	LARGE FINGERLING	1,700	10.5	NON-DNR
2012	MUSKELLUNGE	UPPER WISCONSIN RIVER	LARGE FINGERLING	2,540	9.7	DNR HATCHERY
2012	MUSKELLUNGE	UNSPECIFIED	LARGE FINGERLING	790	14.3	NON-DNR
2014	MUSKELLUNGE	UNSPECIFIED	LARGE FINGERLING	150	10.0	NON-DNR
2014	MUSKELLUNGE	UPPER CHIPPEWA RIVER	LARGE FINGERLING	2,498	11.0	DNR HATCHERY
2014	MUSKELLUNGE	UPPER WISCONSIN RIVER	SMALL FINGERLING	1,000	3.1	DNR HATCHERY
2016	MUSKELLUNGE	UPPER WISCONSIN RIVER	LARGE FINGERLING	2,499	10.8	DNR HATCHERY
2018	MUSKELLUNGE	UNSPECIFIED	LARGE FINGERLING	1,343	12.0	DNR HATCHERY
2019	MUSKELLUNGE	UNSPECIFIED	LARGE FINGERLING	1,189	11.9	DNR HATCHERY
2020	STARHEAD TOPMINNOW	UNSPECIFIED	YEARLING	558	1.5	NON-DNR
2021	STARHEAD TOPMINNOW	UNSPECIFIED	ADULT	1,687	1.5	NON-DNR
2022	MUSKELLUNGE	UPPER WISCONSIN RIVER	LARGE FINGERLING	2,486	12.0	DNR HATCHERY

Table 3. Dimensions, dates and locations (GPS coordinates) of fyke nets used during the 2023 SN1 and SN2 surveys of Lake Wisconsin, Columbia County and Sauk County, Wisconsin.

PERIOD	NET NUMBER	LEAD LENGTH (FEET)	FRAME HEIGHT (FEET)	SET DATE	FINAL LIFT DATE	LATITUDE	LONGITUDE
SN1	1	50	3	3/20/2023	3/28/2023	43.37407	-89.66766
SN1	2	50	3	3/20/2023	3/28/2023	43.37320	-89.66859
SN1	3	50	2	3/20/2023	3/26/2023	43.37338	-89.66752
SN1	4	75	3	3/20/2023	3/22/2023	43.41840	-89.53174
SN1	5	50	3	3/20/2023	3/24/2023	43.41690	-89.53181
SN1	6	75	2	3/20/2023	3/27/2023	43.39516	-89.58113
SN1	7	50	3	3/21/2023	3/27/2023	43.39396	-89.57962
SN1	8	100	2	3/24/2023	3/28/2023	43.37444	-89.66898
SN1	9	75	2	3/24/2023	3/30/2023	43.39741	-89.52139
SN1	10	75	3	3/24/2023	3/30/2023	43.39672	-89.52100
SN2	1A	75	2	4/18/2023	4/27/2023	43.37300	-89.55215
SN2	2A	50	3	4/18/2023	4/21/2023	43.37213	-89.55149
SN2	3A	50	3	4/18/2023	4/28/2023	43.35862	-89.57405
SN2	10A	50	4	4/18/2023	4/28/2023	43.36317	-89.59106
SN2	11	50	3	4/18/2023	4/25/2023	43.36005	-89.63485
SN2	12	50	3	4/18/2023	4/21/2023	43.36597	-89.68838
SN2	13	75	3	4/18/2023	4/20/2023	43.36338	-89.69405
SN2	14	50	3	4/18/2023	4/28/2023	43.35558	-89.64928
SN2	15	75	3	4/20/2023	4/21/2023	43.35988	-89.69152
SN2	16	75	3	4/21/2023	4/25/2023	43.36365	-89.66297
SN2	17	75	3	4/21/2023	4/28/2023	43.35427	-89.57759
SN2	18	50	3	4/21/2023	4/25/2023	43.36529	-89.59609
SN2	19	50	3	4/25/2023	4/27/2023	43.39396	-89.57962

Table 4. Locations of 0.5-mile electrofishing stations (GPS coordinates) sampled during SE2 on Lake Wisconsin, Columbia County and Sauk County, Wisconsin in 2023.

STATION NAME	DATE	START TIME	END TIME	TARGET SPECIES	WATER TEMPERATURE (°F)	START LATITUDE	START LONGITUDE	END LATITUDE	END LONGITUDE
LW97	5/15/2023	2050	2111	Sportfish	60	43.33632	-89.70340	43.32980	-89.70748
LW99	5/15/2023	2140	2156	All species	62	43.32638	-89.71511	43.32830	-89.72152
LW102	5/15/2023	2215	2230	Sportfish	61	43.32302	-89.72288	43.31644	-89.72588
LW6	5/15/2023	2315	2330	Sportfish	61	43.33497	-89.69865	43.33957	-89.69442
LW10	5/15/2023	2350	5	Sportfish	61	43.35541	-89.68082	43.35864	-89.67313
LW15	5/16/2023	30	45	Sportfish	61	43.35561	-89.64540	43.35716	-89.64414
LW80	5/16/2023	2045	2102	Sportfish	62	43.36225	-89.65939	43.36331	-89.66549
LW82	5/16/2023	2135	2150	Sportfish	63	43.36921	-89.66971	43.37260	-89.66807
LW83	5/16/2023	2225	2240	Sportfish	63	43.37260	-89.66806	43.37095	-89.67163
LW85	5/16/2023	2320	2344	Sportfish	61	43.36586	-89.67492	43.36221	-89.68128
LW86	5/17/2023	0	13	All Species	61	43.36222	-89.68128	43.36375	-89.68633
LW96	5/17/2023	50	106	Sportfish	61	43.34243	-89.69963	43.33633	-89.70340
LW44	5/17/2023	2100	2118	All Species	64	43.37031	-89.55098	43.37102	-89.54239
LW46	5/17/2023	2150	2206	Sportfish	64	43.37121	-89.55087	43.37239	-89.54324
LW47	5/17/2023	2220	2234	Sportfish	63	43.37239	-89.54324	43.37265	-89.55167
LW38	5/17/2023	2300	2316	Sportfish	63	43.36753	-89.56852	43.36541	-89.56018
LW39	5/17/2023	2333	2345	Sportfish	63	43.36541	-89.56017	43.36557	-89.55164
LW35	5/18/2023	4	20	All species	61	43.36798	-89.57712	43.37354	-89.57980
LW64	5/18/2023	2045	2059	Sportfish	63	43.40402	-89.55402	43.39832	-89.55905
LW66	5/18/2023	2120	2134	Sportfish	65	43.39561	-89.56880	43.39561	-89.57860
LW69	5/18/2023	2153	2208	All species	65	43.39085	-89.58361	43.38846	-89.59200
LW71	5/18/2023	2230	2245	Sportfish	64	43.38633	-89.60113	43.38393	-89.60707
LW76	5/18/2023	2315	2330	All species	65	43.37279	-89.63168	43.36863	-89.63400
LW25	5/19/2023	0	15	Sportfish	63	43.36594	-89.60061	43.36344	-89.59153

Table 5. Locations of electrofishing stations (GPS coordinates) sampled during the fall electrofishing survey of Lake Wisconsin and the Wisconsin River in Wisconsin Dells in 2023.

DATE	STATION	WATER TEMPERATURE (F)	START LATITUDE	START LONGITUDE	END LATITUDE	END LONGITUDE	DISTANCE (MILES)[1]
10/09/2023	Moon Valley	62	43.36250	-89.66497	43.36289	-89.67817	2.45
10/09/2023	Okee Bay	59	43.36663	-89.61944	43.35795	-89.58293	2.35
10/10/2023	Upper Lake A	57	43.40632	-89.54243	43.41625	-89.52888	
10/10/2023	Upper Lake B	57	43.41787	-89.54115	43.40914	-89.54582	2.14
10/10/2023	Stoner's Bay	57	43.39417	-89.57956	43.37915	-89.61616	2.70
10/11/2023	Weigand's Bay A	62	43.36209	-89.68103	43.36372	-89.68641	
10/11/2023	Weigand's Bay B	62	43.36293	-89.69034	43.35953	-89.68684	2.40
10/11/2023	Gruber's Grove	64	43.32710	-89.71078	43.32184	-89.72305	2.25
10/18/2023	Kilbourn #1 A	51	43.60742	-89.76897	43.61140	-89.77267	
10/18/2023	Kilbourn #1 B	51	43.61186	-89.77176	43.61662	-89.77359	
10/18/2023	Kilbourn #1 C	51	43.61909	-89.77318	43.62352	-89.77969	1.50
10/18/2023	Kilbourn #2 A	51	43.60545	-89.75760	43.60587	-89.76478	
10/18/2023	Kilbourn #2 B	51	43.60517	-89.75692	43.60580	-89.76794	1.65

[1]Distances listed for Upper Lake Part B, Weigand's Bay Part B, Kilbourn #1 Part C, and Kilbourn #2 Part B are the total distances for all parts of the respective stations.

Table 6. The PSD length categories (inches) for selected fish species sampled from Lake Wisconsin in 2023 (Anderson and Neumann 1996, Guy et al. 2007).

SPECIES	STOCK	QUALITY (PSD)	HARVEST (PSD-H)[1]	PREFERRED (PSD-P)	MEMORABLE (PSD-M)	TROPHY (PSD-T)[2]
Bluegill	3	6	7	8	10	12
Black crappie	5	8	9	10	12	15
White crappie	5	8	9	10	12	15
Yellow perch	5	8	9	10	12	15
Largemouth bass	8	12	14	15	20	25
Smallmouth bass	7	11	14	14	17	20
Sauger	8	12	15	15	20	25
Walleye	10	15	15	20	25	30
Northern pike	14	21	26	28	34	44
Muskellunge	20	30		38	42	50

1. Lengths of fish found socially (bluegill, black crappie, white crappie and yellow perch) or legally (largemouth bass, northern pike, smallmouth bass, sauger and walleye) acceptable for harvest by anglers.
2. The trophy category length for muskellunge (50 inches) is also the minimum length limit for harvest in Lake Wisconsin.

Table 7. Summary of catch and catch-per-unit effort (CPUE) by sampling period during the 2023 comprehensive fishery survey of Lake Wisconsin, Columbia County and Sauk County, Wisconsin.

	CATCH				CPUE (FISH/NET-NIGHT)		(FISH/MILE)
Species	**SN1**	**SN2**	**SE2**	**Total**	**SN1**	**SN2**	**SE2**
Bluegill	9,708	394	136	10,238	170.3	5.5	45.3
Pumpkinseed	807	21	2	830	14.2	0.3	0.7
Yellow perch	495	92	27	614	8.7	1.3	9.0
Walleye	1	41	410	452	0.0	0.6	34.2
Sauger	0	15	330	345	0.0	0.2	27.5
Black crappie	139	157	43	339	2.4	2.2	14.3
Northern pike	252	22	8	282	4.4	0.3	0.7
Freshwater drum	1	58	153	212	0.0	0.8	51.0
White crappie	58	129	8	195	1.0	1.8	2.7
Smallmouth bass	1	0	156	157	0.0	0.0	13.0
Largemouth bass	67	12	57	136	1.2	0.2	4.8
Common carp	3	56	10	69	0.1	0.8	3.3
Golden shiner	52	6	4	62	0.9	0.1	1.3
Bowfin	47	12	0	59	0.8	0.2	0.0
Quillback	2	0	55	57	0.0	0.0	18.3
White sucker	34	5	5	44	0.6	0.1	1.7
White bass	1	29	7	37	0.0	0.4	2.3
Spotted sucker	10	1	7	18	0.2	0.0	2.3
Flathead catfish	0	4	3	7	0.0	0.1	1.0
Muskellunge	0	7	0	7	0.0	0.1	0.0
Yellow bullhead	4	3	0	7	0.1	0.0	0.0
Yellow bass	0	5	1	6	0.0	0.1	0.3
Channel catfish	1	2	2	5	0.0	0.0	0.7
Gizzard shad	2	3	0	5	0.0	0.0	0.0
GSFxPKS hybrid	2	2	0	4	0.0	0.0	0.0
Black bullhead	1	2	0	3	0.0	0.0	0.0
Grass pickerel	3	0	0	3	0.1	0.0	0.0
Green sunfish	2	0	0	2	0.0	0.0	0.0

Table 7. continued

Rock bass	2	0	0	2	0.0	0.0	0.0
Shorthead redhorse	0	0	2	2	0.0	0.0	0.7
Brown bullhead	1	0	0	1	0.0	0.0	0.0
Saugeye	0	0	1	1	0.0	0.0	0.1
Smallmouth buffalo	0	2	0	2	0.0	0.0	0.0
	11,696	1,080	1,427	14,203			

Table 8. Summary of lengths (inches), PSD and ages of gamefish sampled during the 2023 comprehensive fishery survey of Lake Wisconsin, Columbia County and Sauk County, Wisconsin.

SPECIES	PERIOD[1]	NUMBER COLLECTED	NUMBER MEASURED	LENGTH RANGE	MEAN LENGTH	MEDIAN LENGTH	PSD	PSD-H	PSD-P	PSD-M	AGE RANGE	MEAN RELATIVE WEIGHT
Bluegill	NET	10,102	1,105	3.4-8.9	6.1	6.2	63	19	4	0		
Bluegill	SE2	136	136	3.4-8.9	6.1	6.2	59	23	2	0		
Bluegill	ALL	10,238	1,241	3.8-8.4	6.2	6.2	58	24	2	0	2-7	94.5
White crappie	ALL	195	169	4.3-14.4	9.1	9.1	92	66	27	12	1-8	96.2
Black crappie	ALL	339	274	3.5-14.6	9.4	9.0	73	57	55	34	1-13	102.3
Yellow perch	ALL	614	382	4.1-10.7	6.8	6.6	11	4	1	0	1-5	106.7
Walleye	SE1	1,082	1,068	6.0-30.1	15.8	15.0	60	60	27	7	1-14	91.7
Walleye	NET,SE2	452	449	4.5-28.5	11.3	9.2	47	47	13	6		
Sauger	ALL	430	430	4.5-19.3	9.3	7.5	41	27	27	0	1-8	89.5
Largemouth bass	ALL	136	133	5.3-18.0	12.2	12.4	58	31	22	0	1-11	105.0
Smallmouth bass	ALL	157	157	4.0-19.8	12.1	11.9	69	26	26	7	1-10	99.3
Muskellunge	ALL	7	7	33.7-46.2	37.3	35.5					4-12	91.5
Northern pike	ALL	282	248	9.9-40.6	22.6	21.8	62	36	29	8	1-9	98.9

1. NET = both spring netting periods; SN1 and SN2.

Table 9. Bluegill size-specific electrofishing catch rates (CPUE; fish/mile) from SE2 surveys of lakes in the Poynette management area, 2011-2023.

			CPUE				AREA RANK			
Lake[1,2]	**County**	**Year**	**Total**	**6"+**	**7"+**	**8"+**	**Total**	**6”+**	**7”+**	**8”+**
Silver	Columbia	2016	345.0	5.0	0.0	0.0	1	20	NA	NA
Tarrant	Columbia	2018	267.0	37.0	22.0	7.0	2	13	T-5	T-1
Blass	Sauk	2017	190.0	50.0	27.3	1.3	3	T-6	3	8
Fish-Mud	Dane	2021	189.0	16.0	1.0	0.0	4	17	20	NA
Mirror	Sauk	2014	143.3	62.0	14.7	0.0	5	T-3	8	NA
Dutch Hollow	Sauk	2016	141.3	69.3	30.7	6.0	6	2	1	3
Fish	Dane	2015	135.0	46.0	8.0	0.0	7	9	12	NA
Seeley	Sauk	2016	123.4	85.5	14.5	0.0	8	1	9	NA
Lazy	Columbia	2011	122.0	24.0	13.0	0.0	9	15	10	NA
Mud (Marx Pond)	Dane	2015	120.7	38.0	0.0	0.0	10	12	NA	NA
White Mound	Sauk	2019	102.0	48.0	22.0	7.0	11	8	T-5	T-1
George	Columbia	2013	101.0	53.5	19.2	0.0	12	5	7	NA
West	Columbia	2019	86.7	2.7	1.3	0.0	13	22	19	NA
Crystal	Dane/Col.	2015	79.3	62.0	28.7	0.0	14	T-3	2	NA
Swan	Columbia	2018	74.0	38.7	6.7	0.7	15	11	13	9
Delton	Sauk	2021	68.0	50.0	3.0	0.0	16	T-6	T-14	NA
Redstone	Sauk	2022	61.0	17.5	3.0	0.0	17	16	T-14	NA
Virginia	Sauk	2016	53.9	38.8	26.7	4.2	18	10	4	4
Wisconsin	**Col/Sauk**	**2023**	**45.3**	**28.7**	**8.7**	**1.7**	**19**	**14**	**11**	**7**
Park	Columbia	2021	43.0	15.0	2.0	0.0	20	18	18	NA
Spring	Columbia	2018	32.0	2.0	0.0	0.0	21	T-23	NA	NA
La Valle Millpond	Sauk	2021	29.0	1.0	0.0	0.0	22	25	NA	NA
Wyona	Columbia	2022	22.0	2.0	0.0	0.0	23	T-23	NA	NA
Crystal	Columbia	2014	20.0	2.9	2.9	2.9	24	21	17	6
Devils	Sauk	2013	12.0	6.0	3.0	3.0	25	19	T-14	5
Area Mean			104.2	32.1	10.3	1.4				
Area Median			86.7	37.0	6.7	0.0				

1. Mud Lake and Fish Lake are listed separately for 2015 and as one combined lake for 2021. Two lakes became one due to high water in 2019.
2. Crystal Lake in Columbia County (2014) is 28 acres and is located within the Peter Helland Wildlife Area near Pardeeville.

Table 10. Yellow perch size structure metrics for lakes in the Poynette management area, 2013-2023.

LAKE[1]	COUNTY	YEAR	NUMBER COLLECTED	NUMBER MEASURED	PSD	PSD-9	PSD-P	PSD-M	MEAN LENGTH	MEDIAN LENGTH	LARGEST FISH
White Mound	Sauk	2019	131	130	71	42	16	0	8.6	8.7	11.9
Devils	Sauk	2013	106	106	63	51	37	10	9.0	9.1	13.5
Swan	Columbia	2018	887	887	26	8	2	0	7.3	7.2	12.0
Crystal	Dane	2015	590	590	23	3	0	0	7.4	7.5	9.8
Redstone	Sauk	2022	245	226	19	6	2	0	7.0	6.9	11.6
Wisconsin	**Col/Sauk**	**2023**	**614**	**382**	**11**	**4**	**1**	**0**	**6.8**	**6.6**	**10.7**
Mirror	Sauk	2014	267	267	6	2	0	0	6.2	6.0	9.9
Park	Columbia	2021	4,718	1,197	3	1	0	0	6.1	6.0	11.3
Fish	Dane	2021	369	72					6.3	6.3	8.8

1. Fish Lake now includes Fish and Mud lakes in Dane County which combined into one lake when rising lake levels inundated Fish Lake Road in 2019.

Table 11. Black crappie size structure metrics for lakes in the Poynette management area, 2011-2023.

LAKE[1]	COUNTY	YEAR	SURFACE AREA (ACRES)	NUMBER COLLECTED	NUMBER MEASURED	MEAN LENGTH	MEDIAN LENGTH	LARGEST FISH	PSD	PSD-9	PSD-P	PSD-M
Mud	Dane	2015	85	1,344	473	8.2	8.7	9.8	97	37	0	0
Park	Columbia	2021	312	512	351	10.4	10.4	13.5	92	88	77	27
Lazy	Columbia	2011	161	342	173	8.4	8.8	12.0	86	52	17	1
Crystal	Dane	2015	600	764	764	8.3	8.4	10.8	78	17	1	0
Swan	Columbia	2018	406	525	525	9.2	9.7	13.0	78	68	43	1
Wisconsin	**Columbia**	**2023**	**7,200**	**339**	**274**	**9.0**	**9.0**	**14.6**	**73**	**57**	**55**	**34**
Delton	Sauk	2014	267	1,661	635	8.1	8.3	9.4	68	4	0	0
Redstone	Sauk	2022	605	792	756	7.9	6.8	17.4	47	38	22	2
Spring	Columbia	2018	24	951	845	7.4	7.4	12.3	34	12	4	0
Fish	Dane	2021	404	3,173	495	7.2	7.6	12.5	29	3	1	0
Mirror	Sauk	2014	139	510	508	7.5	7.2	12.8	28	17	3	1
Fish	Dane	2015	258	1,627	877	5.3	4.3	9.8	24	4	0	0
Wyona	Columbia	2022	94	57	57	8.9	8.5	13.2				
Dutch Hollow	Sauk	2016	166	76	76	9.3	9.8	12.2				
White Mound	Sauk	2019	104	35	35	5.9	4.0	13.2				
Devils	Sauk	2013	375	17	17	4.9	4.1	11.5				

1. Fish Lake now includes Fish and Mud lakes in Dane County which combined into one lake when rising lake levels inundated Fish Lake Road in 2019.

Table 12. White crappie size structure metrics for lakes in the Poynette management area, 2014-2023.

LAKE[1]	COUNTY	YEAR	NUMBER COLLECTED	NUMBER MEASURED	PSD	PSD-9	PSD-P	PSD-M	MEAN LENGTH	MEDIAN LENGTH	LARGEST FISH
Wisconsin	**Columbia**	**2023**	**195**	**169**	**92**	**66**	**27**	**12**	**9.1**	**9.1**	**14.1**
Redstone	Sauk	2022	971	885	89	60	26	2	9.1	9.1	13.2
Delton	Sauk	2014	104	104	63	1	0	0	8.7	8.8	10.0
Crystal	Dane	2015	68	68					8.5	8.3	11.6
White Mound	Sauk	2019	28	28					5.6	4.4	15.7
Mirror	Sauk	2014	8	8					8.9	8.8	9.7

Table 13. Northern pike abundance and size structure metrics for lakes in the Poynette management area, 2011-2023. Lengths are reported in inches.

LAKE[1]	COUNTY	YEAR	NUMBER OF UNIQUE FISH SAMPLED	SN1 CPUE	MEAN LENGTH	MAX LENGTH	n>40"	PSD	PSD-26	PSD-P	PSD-32	PSD-M	PSD-40
Delton	Sauk	2014	250	4.4	27.7	41.4	2	92	59	45	19	14	1
Devils	Sauk	2013	119	2.4	30.2	40.0	1	87	73	65	49	41	1
Park	Columbia	2021	151	1.3	23.9	37.9	0	79	40	24	3	1	0
Fish-Mud	Dane	2021	323	7.1	24.5	43.7	6	77	35	24	9	5	2
Swan	Columbia	2018	268	1.0	21.9	33.5	0	66	27	19	1	0	0
Lazy	Columbia	2011	384	5.7	22.4	37.5	0	64	31	16	7	3	0
Wisconsin	**Col/Sauk**	**2023**	**247**	**4.4**	**22.6**	**40.6**	**3**	**63**	**36**	**29**	**13**	**8**	**1**
Mirror	Sauk	2014	302	4.2	21.0	42.0	3	56	10	3	2	2	1
Wyona	Columbia	2022	126	7.9	19.8	35.9	0	42	9	3	1	1	0
Dutch Hollow	Sauk	2016	469	4.6	19.1	35.9	0	22	4	2	1	0	0
Fish	Dane	2015	86	2.0	22.8	38.2	0						
Spring	Columbia	2018	46	1.0	22.8	29.7	0						
White Mound	Sauk	2019	45	0.5	24.0	38.1	0						
Crystal	Dane	2015	18	0.5	26.0	34.3	0						
Mud	Dane	2015	1	0.1	26.4	26.4	0						

1. Mud Lake and Fish Lake are listed separately for 2015 and as one combined lake for 2021. In 2019 rising lake levels inundated Fish Lake Road, causing the two lakes to become one.

Table 14. Smallmouth bass size-specific electrofishing catch rates (CPUE; fish/mile) from SE2 surveys of lakes in the Poynette management area, 2013-2023.

LAKE	COUNTY	YEAR	TOTAL	<7"	7"+	11"+	14"+	17"+
Delton	Sauk	2021	33.2	4.9	28.3	8.9	5.1	0.6
Wisconsin	**Columbia**	**2023**	**13.0**	**0.3**	**12.7**	**8.8**	**3.3**	**0.9**
Devils	Sauk	2013	12.2	0.3	11.9	9.4	0.0	0.0
Redstone	Sauk	2022	4.6	0.8	3.9	2.4	0.5	0.1
Mirror	Sauk	2014	2.0	0.0	2.0	1.2	0.3	0.0
Wyona	Columbia	2022	1.5	0.0	1.5	0.9	0.6	0.0
Swan	Columbia	2018	1.0	0.0	1.0	0.6	0.4	0.1
Park	Columbia	2021	1.0	0.0	1.0	0.2	0.0	0.0
Dutch Hollow	Sauk	2016	0.5	0.0	0.5	0.5	0.0	0.0
Area Mean			7.7	0.7	7.0	3.6	1.1	0.2
Area Median			2.0	0.0	2.0	1.2	0.4	0.0

Table 15. Largemouth bass size-specific electrofishing catch rates (CPUE; fish/mile) from SE2 surveys of lakes in the Poynette management area, 2011-2023.

			CPUE						AREA CPUE RANK					
LAKE[1,2,3]	COUNTY	YEAR	Total	8"+	12"+	14"+	18"+	20"+	Total	8"+	12"+	14"+	18"+	20"+
White Mound	Sauk	2019	273.2	243.2	102.4	5.2	1.6	0.8	1	1	2	12	4	1
Virginia	Sauk	2016	207.9	201.2	172.7	2.4	0.0	0.0	2	2	1	18	NA	NA
Crystal	Columbia	2014	190.5	184.8	23.8	0.0	0.0	0.0	3	3	7	23	NA	NA
Tarrant	Columbia	2018	81.0	76.0	44.0	31.0	0.0	0.0	4	5	3	1	NA	NA
Dutch Hollow	Sauk	2016	79.2	76.2	43.3	11.3	0.7	0.0	5	4	4	3	7	NA
Silver	Columbia	2016	72.4	59.6	23.2	10.4	0.0	0.0	6	6	8	4	NA	NA
Devils	Sauk	2013	55.8	51.9	32.2	0.6	0.3	0.0	7	7	5	22	T-10	NA
George	Columbia	2013	49.5	45.5	13.1	1.0	0.0	0.0	8	8	10	20	NA	NA
Fish	Dane	2015	35.3	26.5	23.9	15.6	2.1	0.3	9	10	6	2	1	5
Blass	Sauk	2017	32.7	28.7	12.0	6.7	0.0	0.0	10	9	11	10	NA	NA
Lazy	Columbia	2011	32.5	26.0	11.5	3.8	0.3	0.3	11	11	13	16	12	6
Redstone	Sauk	2022	28.6	19.8	11.6	5.6	0.1	0.0	12	14	12	11	13	NA
Seeley	Sauk	2016	25.8	21.0	13.7	8.1	0.0	0.0	13	13	9	6	NA	NA
Crystal	Dane/Col.	2015	23.7	22.1	11.3	7.6	2.1	0.5	14	12	14	7	2	2
Fish	Dane	2021	20.8	18.5	9.6	4.6	1.7	0.4	15	15	16	13	3	4
Mud	Dane	2015	18.7	4.7	1.3	0.7	0.0	0.0	16	23	23	21	NA	NA
Mirror	Sauk	2014	18.2	17.0	11.2	9.0	0.3	0.0	17	16	15	5	9	NA
Delton	Sauk	2021	10.6	10.3	9.4	7.1	0.5	0.0	18	17	17	8	8	NA
Wyona	Columbia	2022	9.9	9.3	8.1	6.9	0.3	0.0	19	18	18	9	T-10	NA
Swan	Columbia	2018	7.4	7.0	5.0	3.9	0.9	0.4	20	19	19	15	6	3
Spring	Columbia	2018	7.0	6.0	4.0	4.0	0.0	0.0	21	20	20	14	NA	NA
Park	Columbia	2021	6.3	5.4	3.7	2.9	1.0	0.0	22	21	21	17	5	NA
Wisconsin	**Columbia**	**2023**	**4.8**	**4.8**	**3.4**	**1.8**	**0.1**	**0.0**	**23**	**22**	**22**	**19**	**14**	**NA**
West	Columbia	2019	2.7	0.0	0.0	0.0	0.0	0.0	24	24	24	24	NA	NA
Area Mean			53.9	48.6	24.8	6.3	0.5	0.1						
Area Median			27.2	21.6	11.6	4.9	0.2	0.0						

1. Crystal Lake in Columbia County is 28 acres and is located within the Peter Helland Wildlife Area near Pardeeville.
2. Mud Lake and Fish Lake are listed separately for 2015 and as one combined lake for 2021 (Fish Lake). In 2019 rising lake levels caused the two lakes to become one.
3. West Lake suffered a significant winter kill event in early 2019 and nearly all of the largemouth bass in the lake died.

Table 16. Mean length at age 6 (MLA-6) of largemouth bass in lakes in the Poynette management area, 2011-2023.

LAKE[1]	COUNTY	YEAR	MLA-6
Park	Columbia	2021	16.6
Wisconsin	**Columbia/Sauk**	**2023**	**16.0**
Fish	Dane	2021	15.8
Spring	Columbia	2018	15.6
Delton	Sauk	2014	15.4
Swan	Columbia	2018	15.3
Lazy	Columbia	2011	14.4
Redstone	Sauk	2022	14.3
Mirror	Sauk	2014	14.2
Fish	Dane	2015	13.1
Crystal	Dane/Col.	2015	13.1
White Mound	Sauk	2019	12.8
Virginia	Sauk	2016	12.5
Dutch Hollow	Sauk	2016	12.2
Devils	Sauk	2013	10.8
Area Mean			14.1
Area Median			14.3

1. Fish Lake includes Mud Lake which became part of Fish Lake in 2019 when rising lake levels inundated the road that separated the two lakes causing them to become one contiguous lake.

Table 17. Catch, CPUE, and length statistics for the 2023 fall electrofishing survey of Lake Wisconsin, Columbia County and Sauk County, Wisconsin.

SPECIES-LOCATION	CATCH	TOTAL CPUE (FISH/MILE)	AGE 0 CPUE (FISH/MILE)	LENGTH RANGE (INCHES)	MEAN LENGTH (INCHES)	MEDIAN LENGTH (INCHES)
Sauger-Lake	1,120	78.4	24.1	4.4-21.0	9.9	10.0
Sauger-Tailwater	117	34.8	2.7	6.8-16.2	11.8	12.1
Walleye-Lake	531	37.2	18.6	5.3-27.3	11.1	9.9
Walleye-Tailwater	163	48.5	19.3	7.1-18.3	11.4	11.5
Smallmouth Bass-Lake	240	16.8		4.1-19.2	11.1	11.1
Smallmouth Bass-Tailwater	119	35.4		3.4-17.7	11.8	11.8
Largemouth Bass-Lake	110	7.7		4.3-18.2	10.9	11.1
Largemouth Bass-Tailwater	2	0.6		14.1-15.6	14.9	
Northern Pike-Lake	9	0.6		21.3-34.5	30.0	31.0
Northern Pike-Tailwater	4	1.2		25.8-30.2	27.2	26.4
Channel Catfish-Lake	3	0.2		21.1-26.6	23.8	23.6
Flathead Catfish-Lake	3	0.2		14.4-16.1	15.6	16.1
Muskellunge-Lake	1	0.1			21.3	

Figures

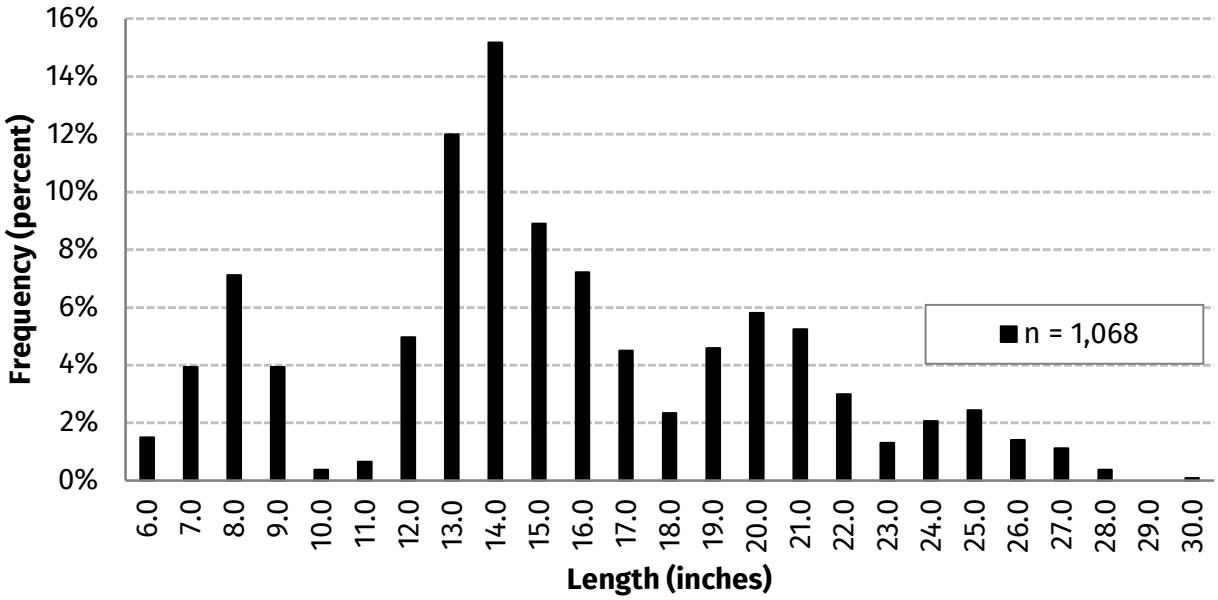


Figure 1. Length frequency distribution of walleyes sampled during SE1 in 2023 in the Kilbourn Dam tailwater of the Wisconsin River.

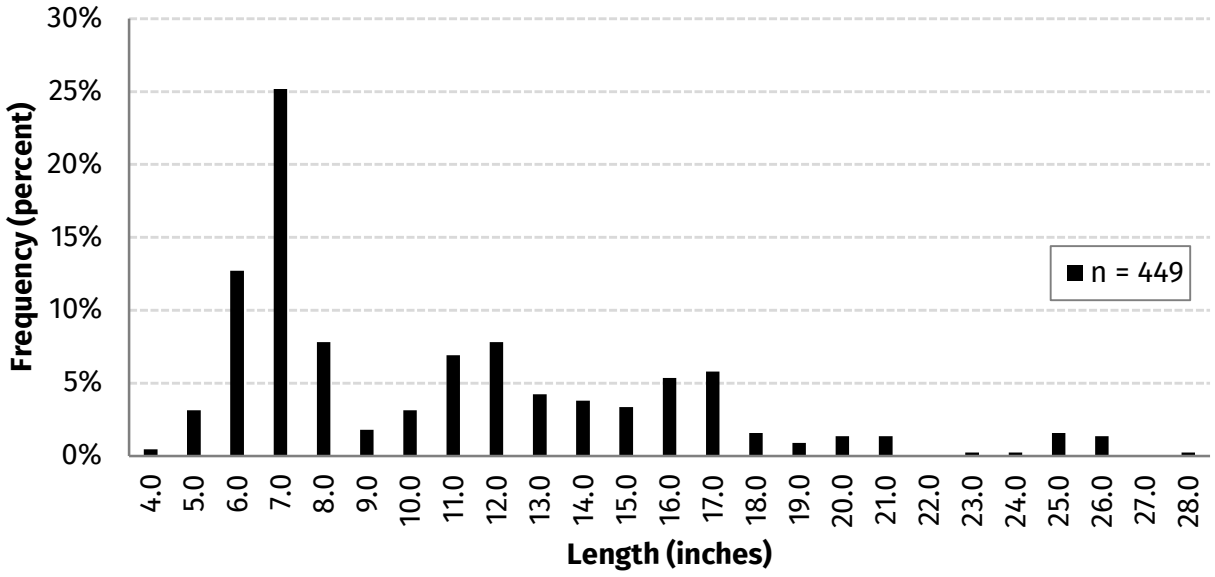


Figure 2. Length frequency distribution of walleyes sampled during the 2023 SN1, SN2 and SE2 surveys of Lake Wisconsin.

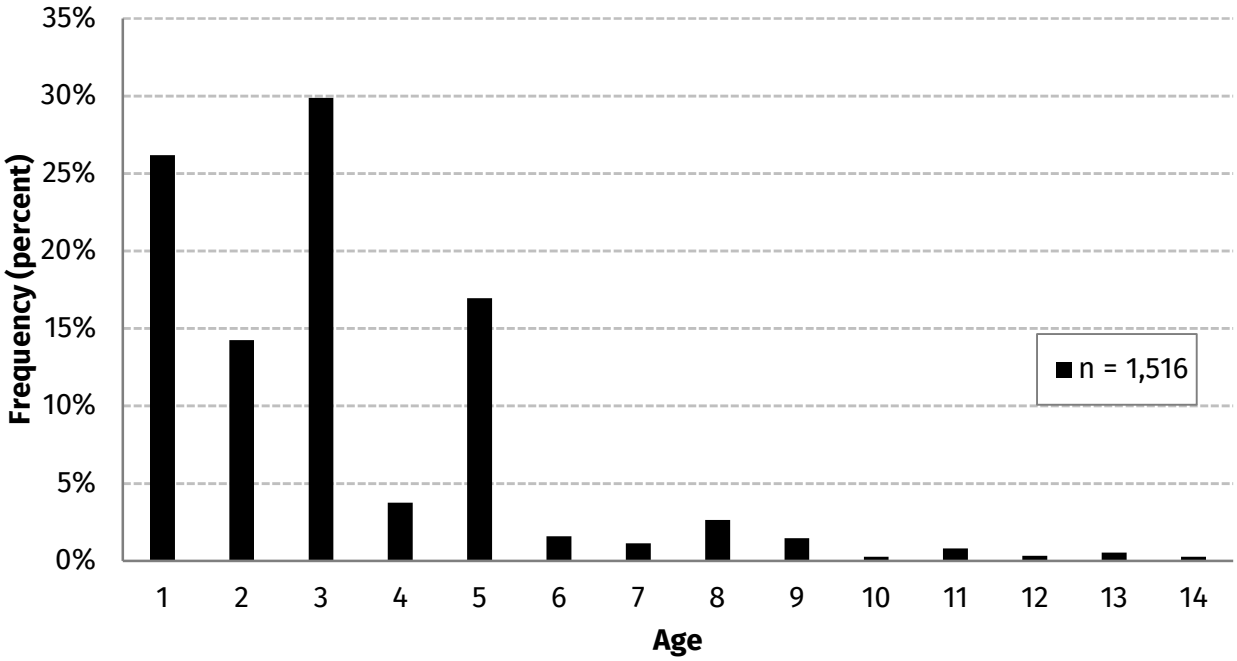


Figure 3. Age frequency distribution of walleyes sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

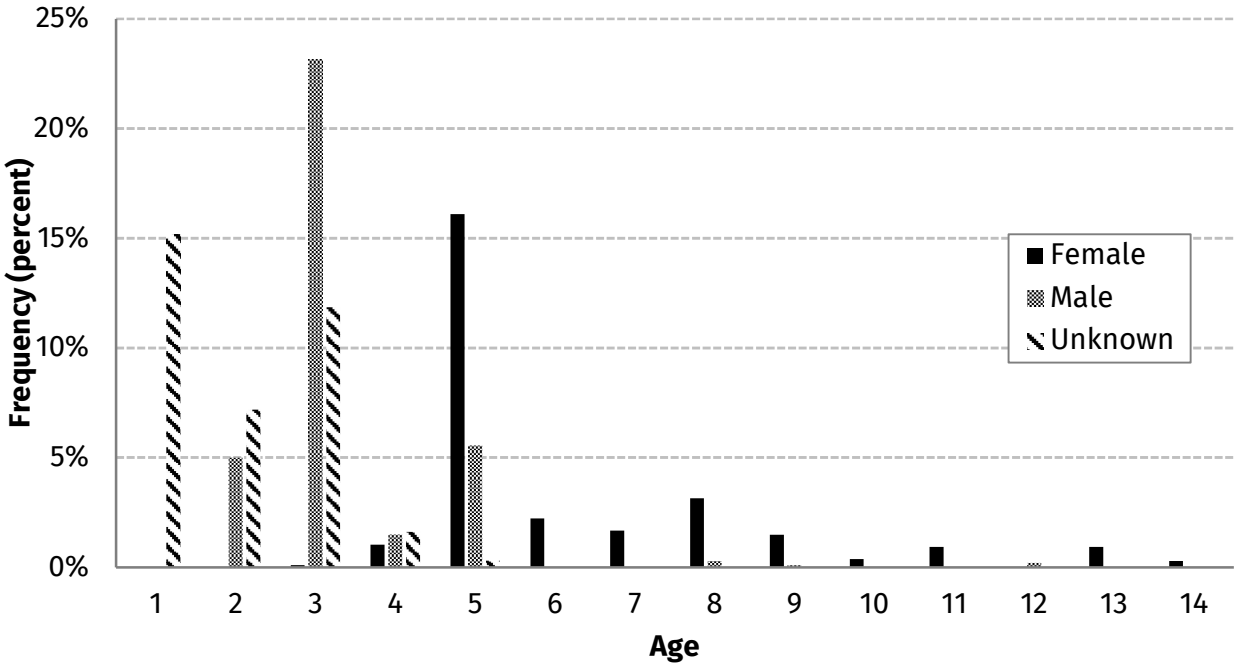


Figure 4. Sex-specific age frequency distribution of walleyes sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

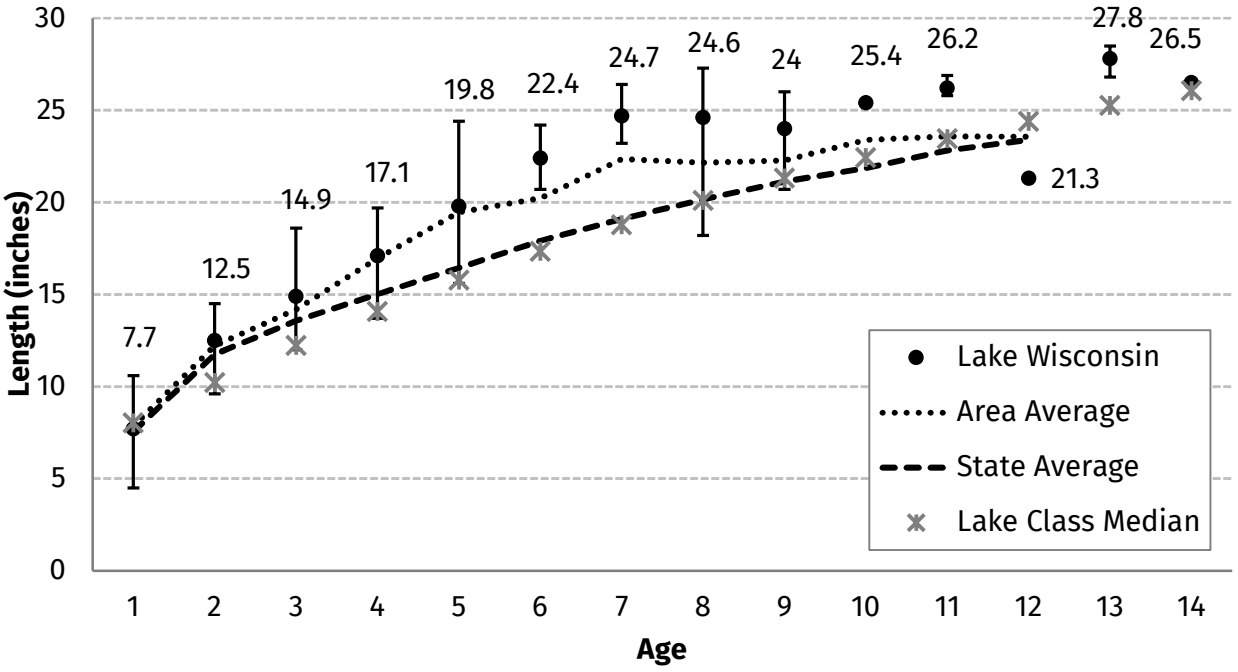


Figure 5. Mean length at age of walleyes sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

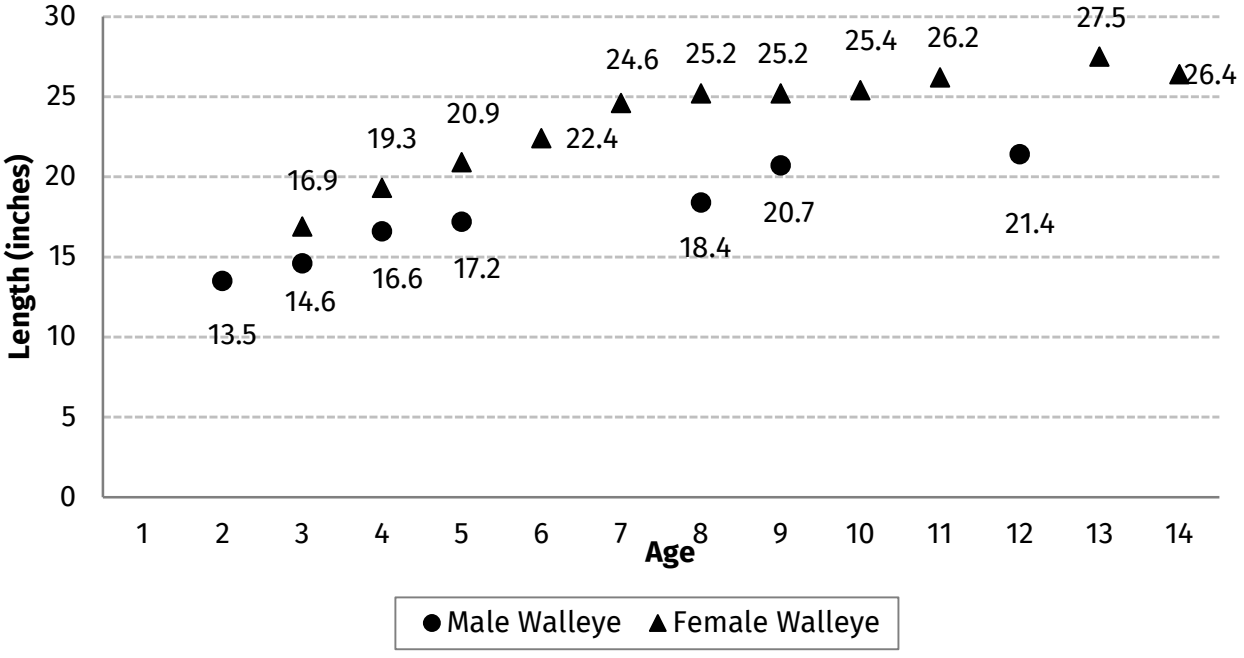


Figure 6. Sex-specific mean length at age of walleyes sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

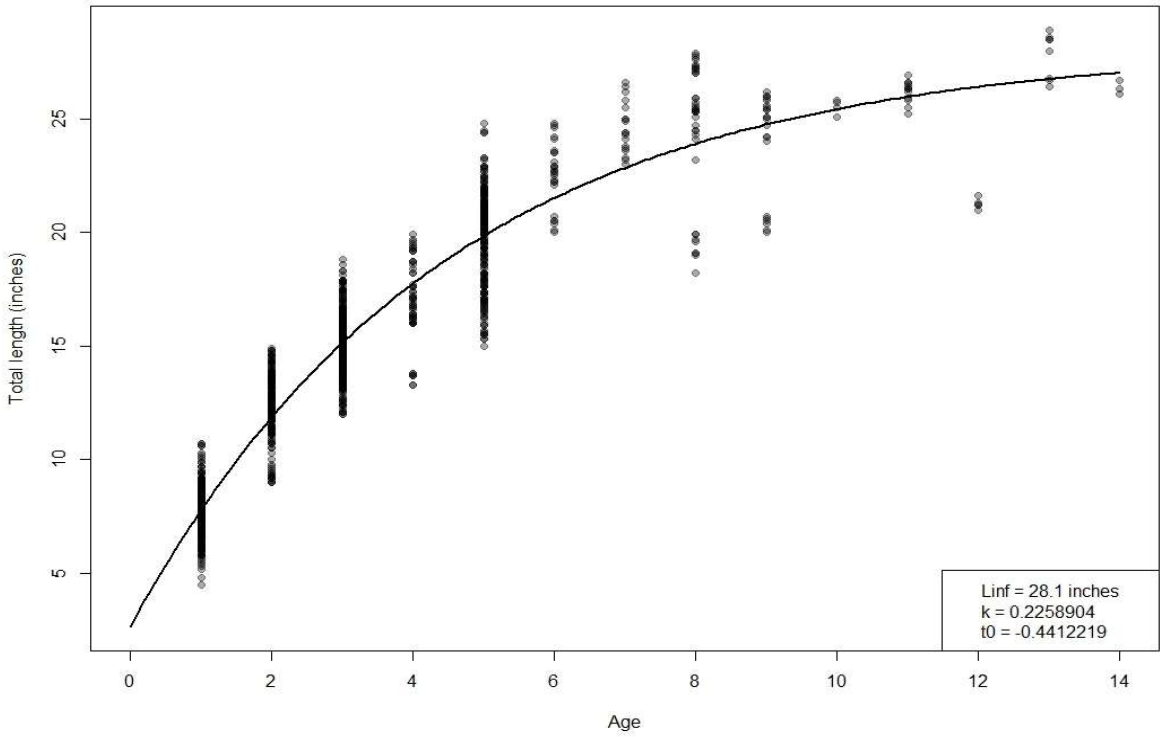


Figure 7. Length at age of walleyes sampled during the 2023 comprehensive fishery survey of Lake Wisconsin with a von Bertalanffy growth curve fitted to the data.

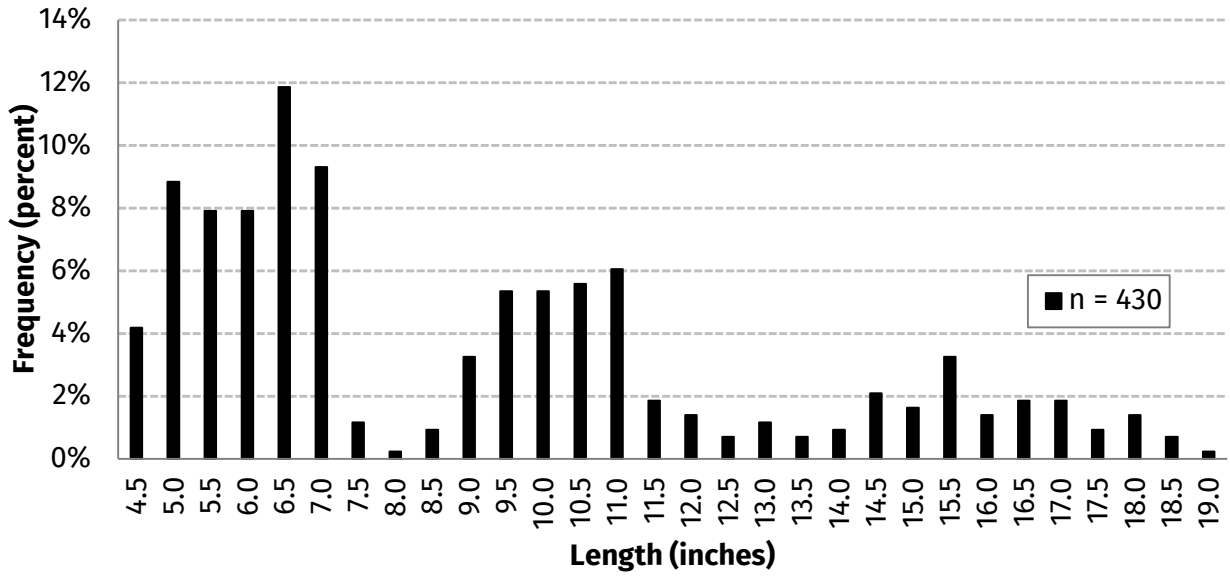


Figure 8. Length frequency distribution of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

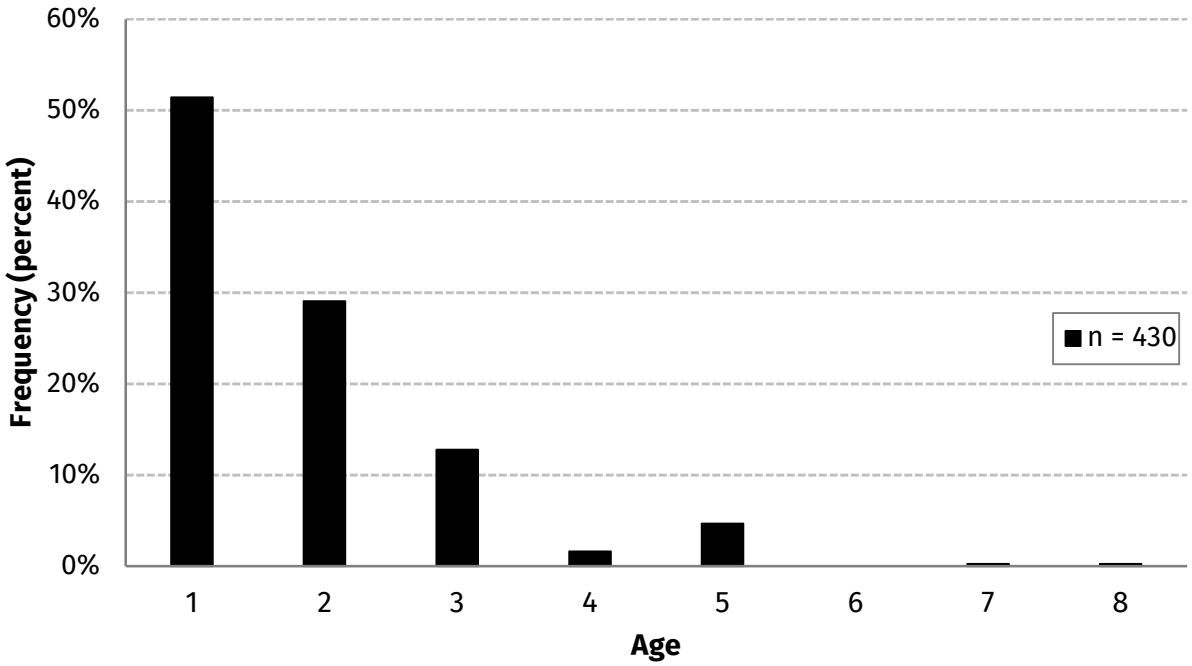


Figure 9. Age frequency distribution of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

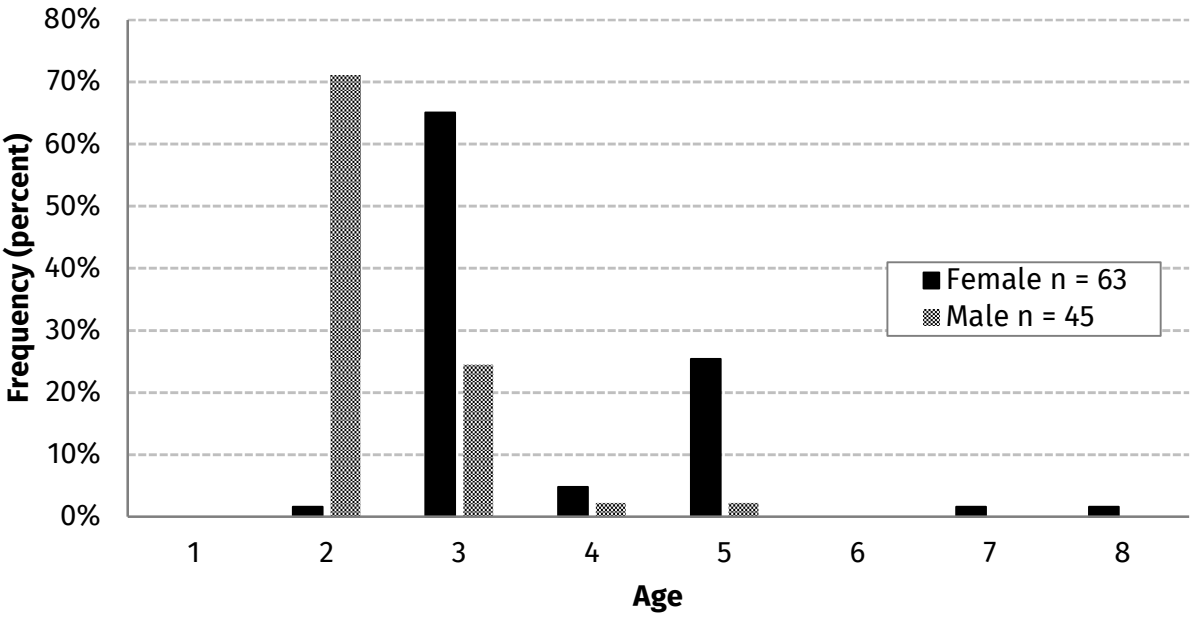


Figure 10. Sex-specific age frequency distributions of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

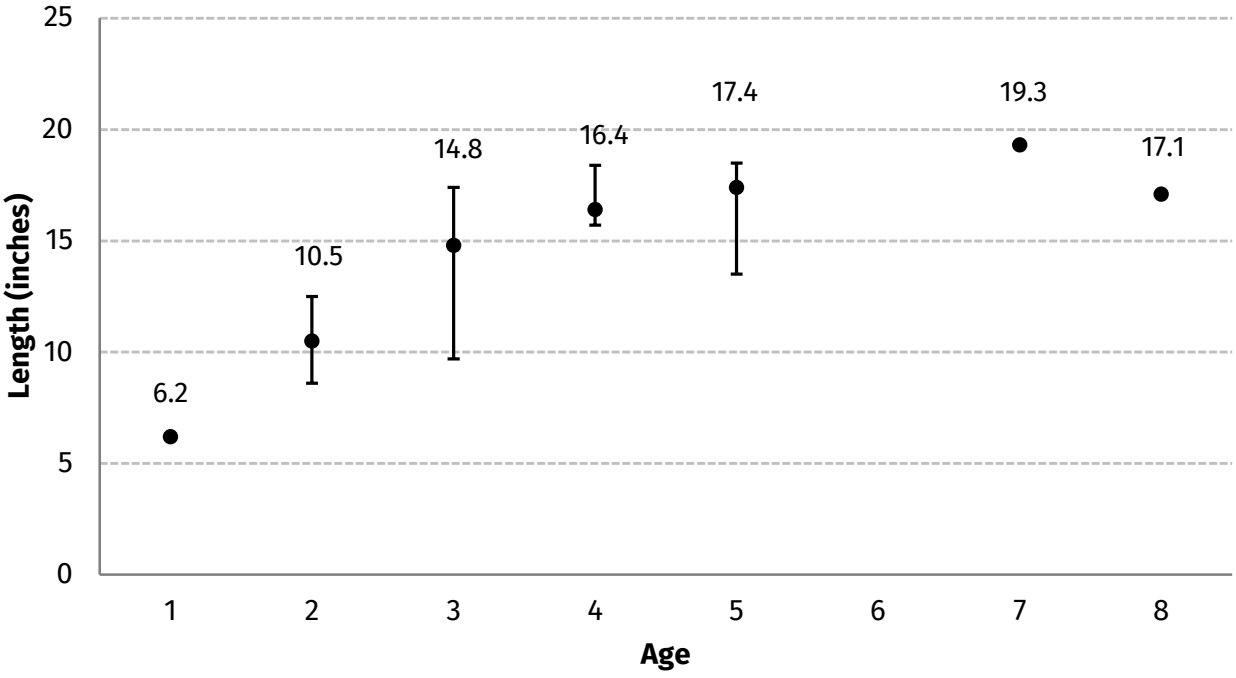


Figure 11. Mean length at age of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

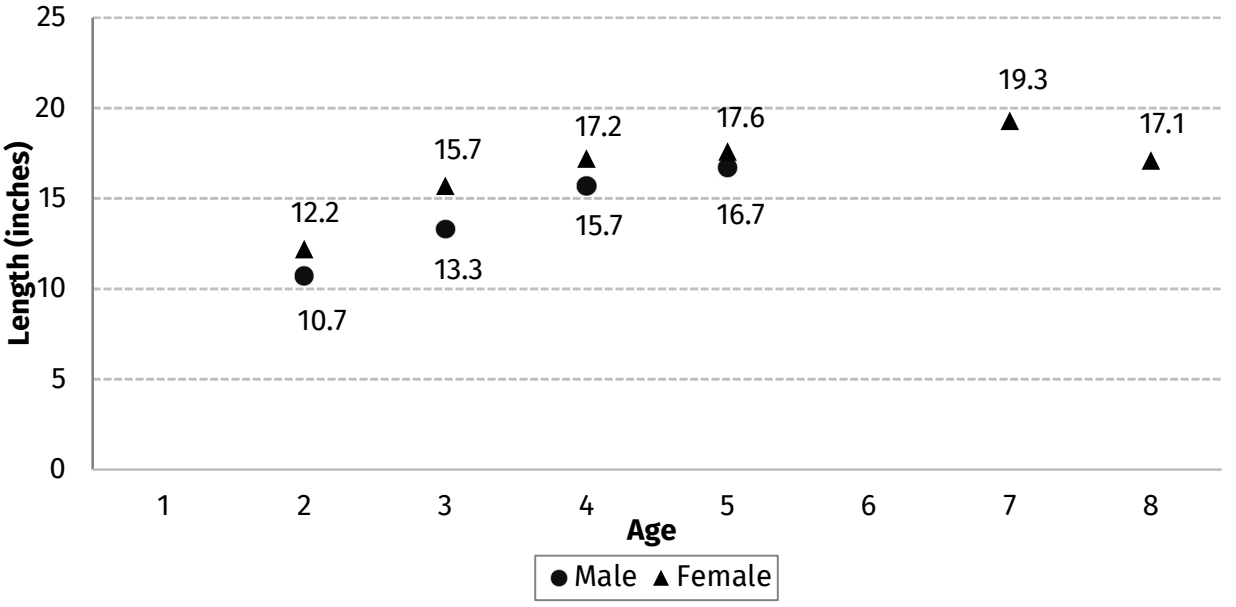


Figure 12. Sex-specific mean length at age of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

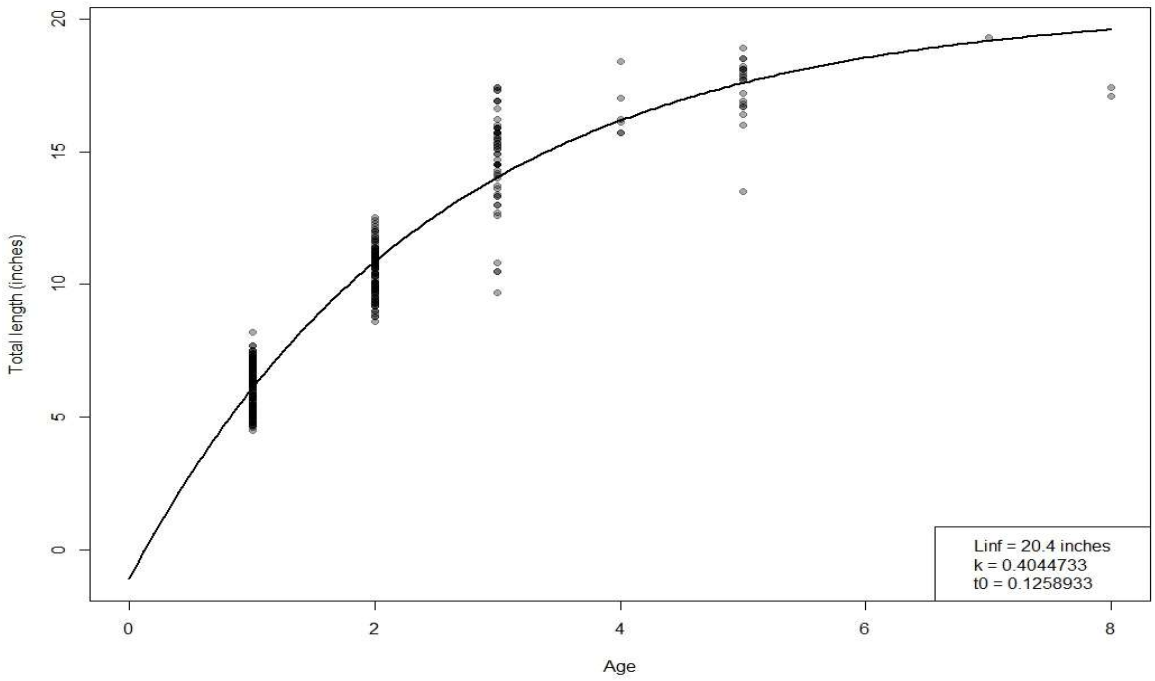


Figure 13. Length at age of sauger sampled during the 2023 comprehensive fishery survey of Lake Wisconsin with a von Bertalanffy growth curve fitted to the data.

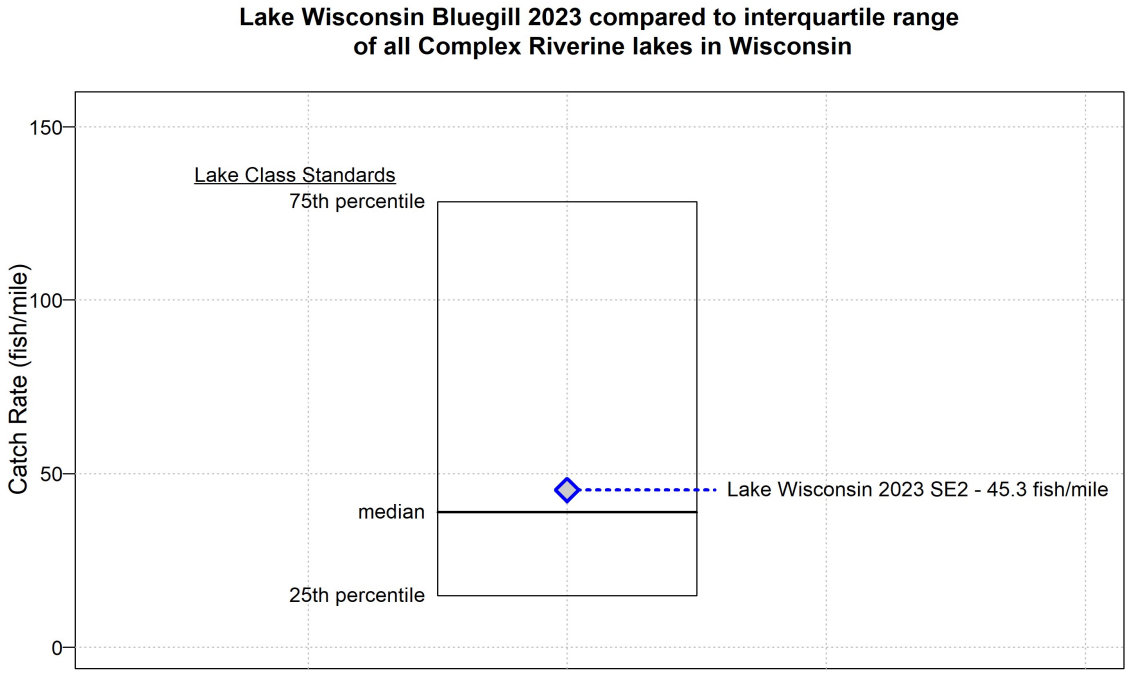


Figure 14. Bluegill SE2 catch rate lake class comparison for Lake Wisconsin.

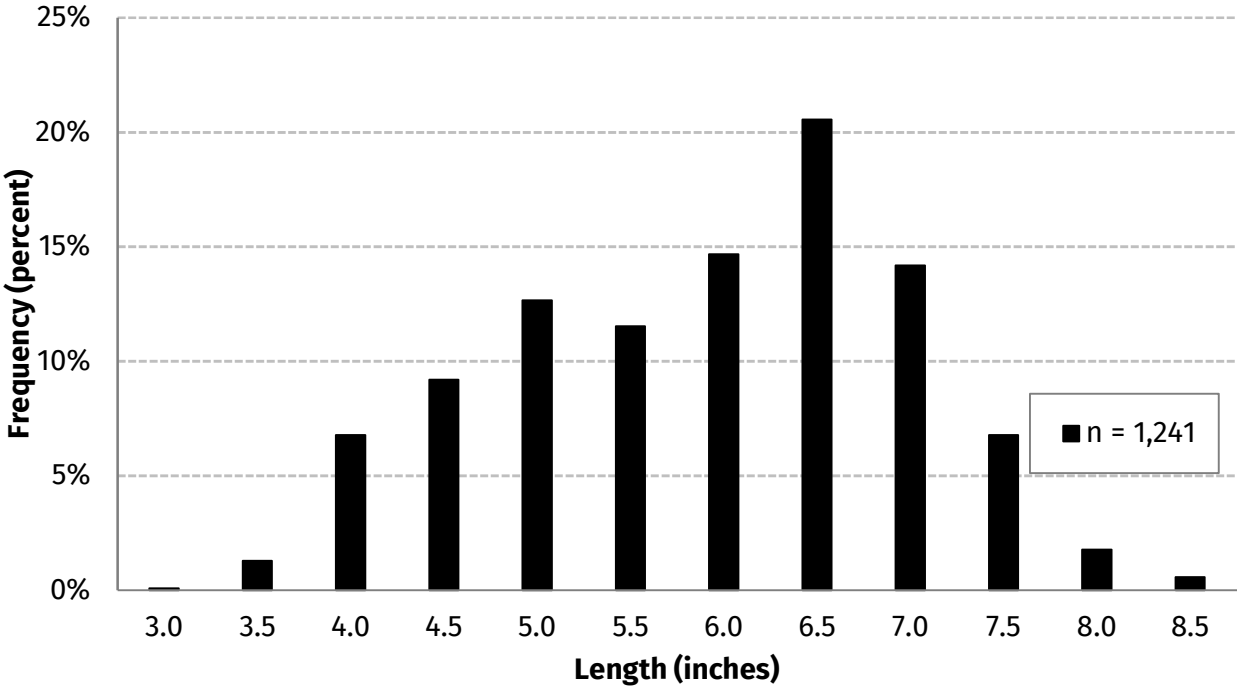


Figure 15. Length frequency distribution of bluegill sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

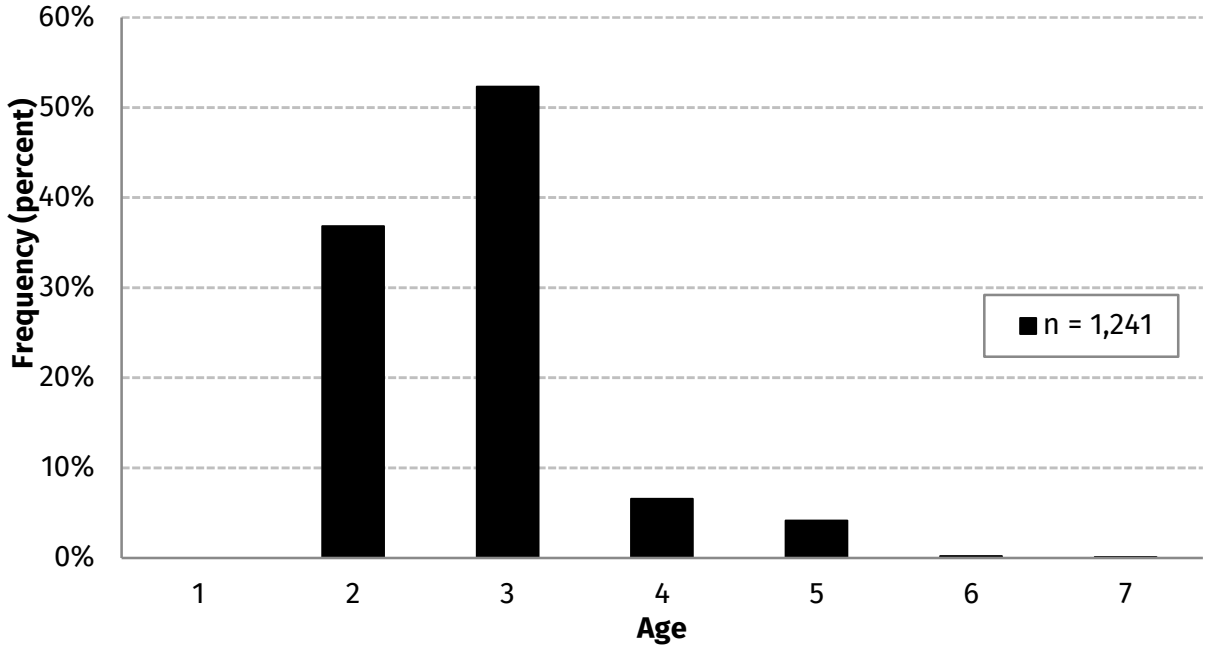


Figure 16. Age frequency distribution of bluegill sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

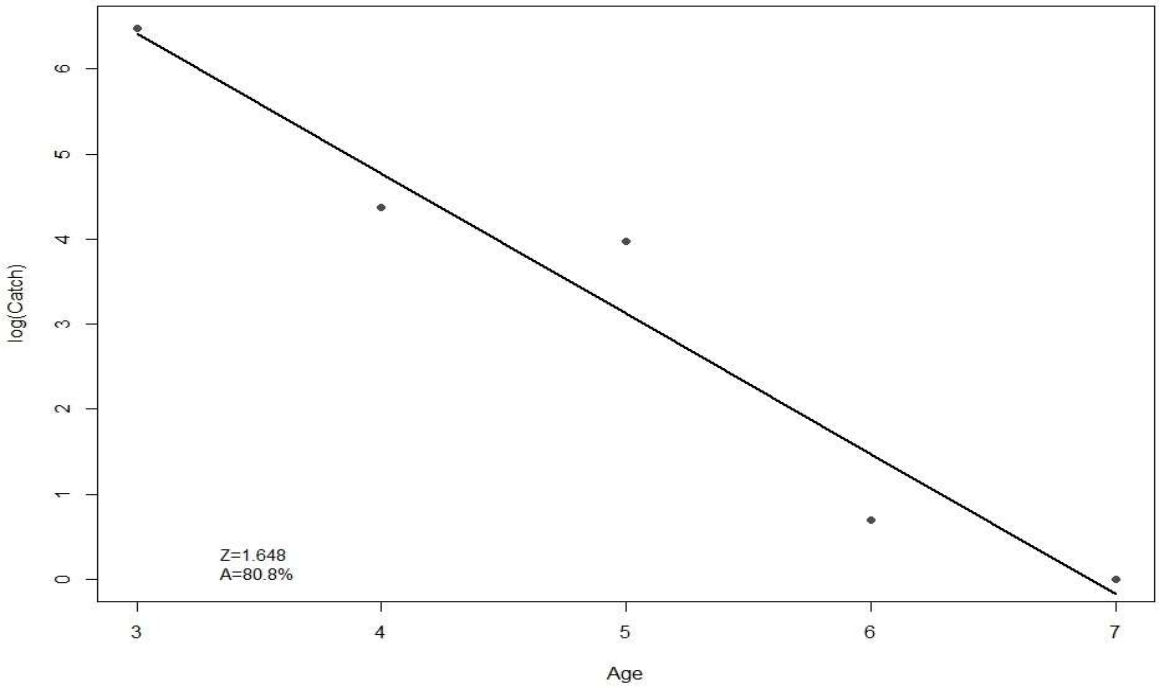


Figure 17. Catch curve for bluegills sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

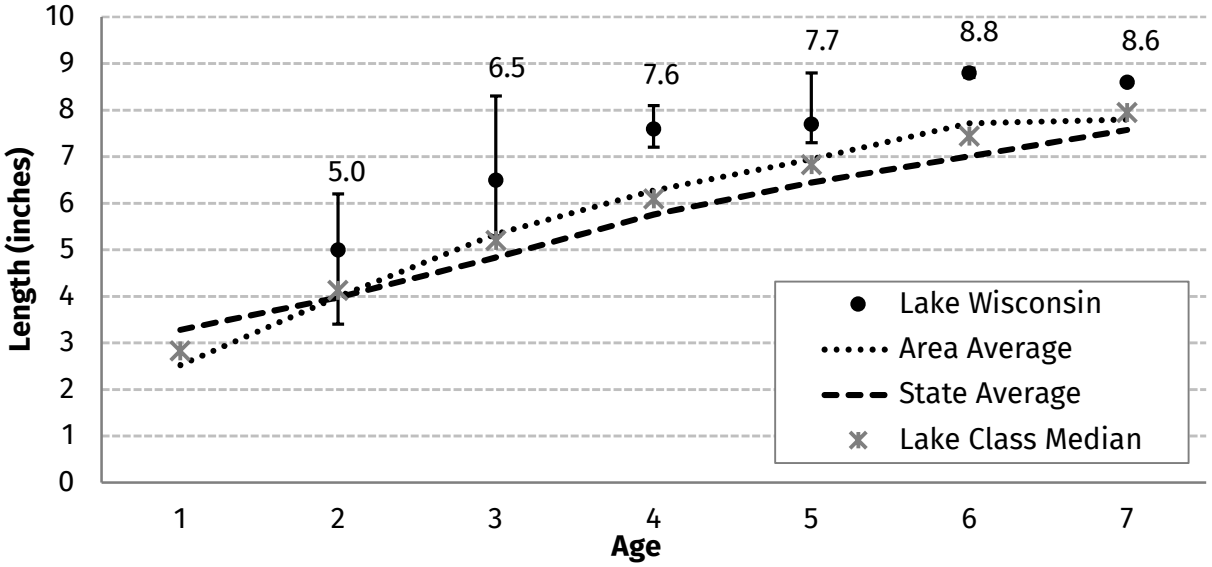


Figure 18. Mean length at age of bluegills sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

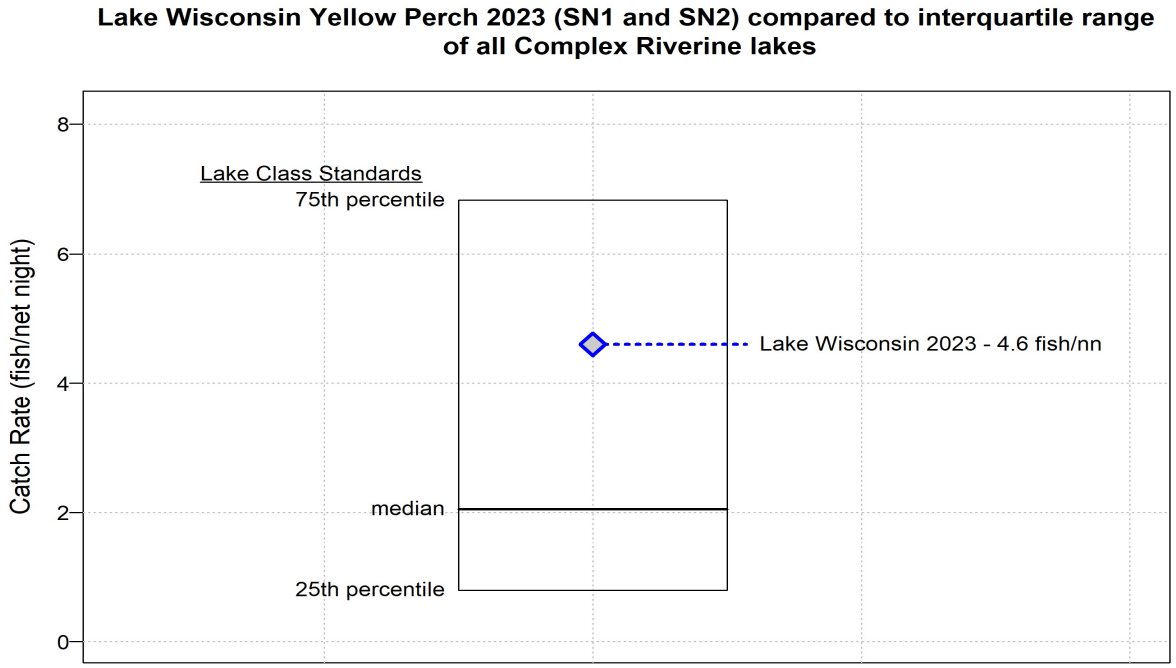


Figure 19. Yellow Perch SN1 and SN2 catch rate lake class comparison for Lake Wisconsin.

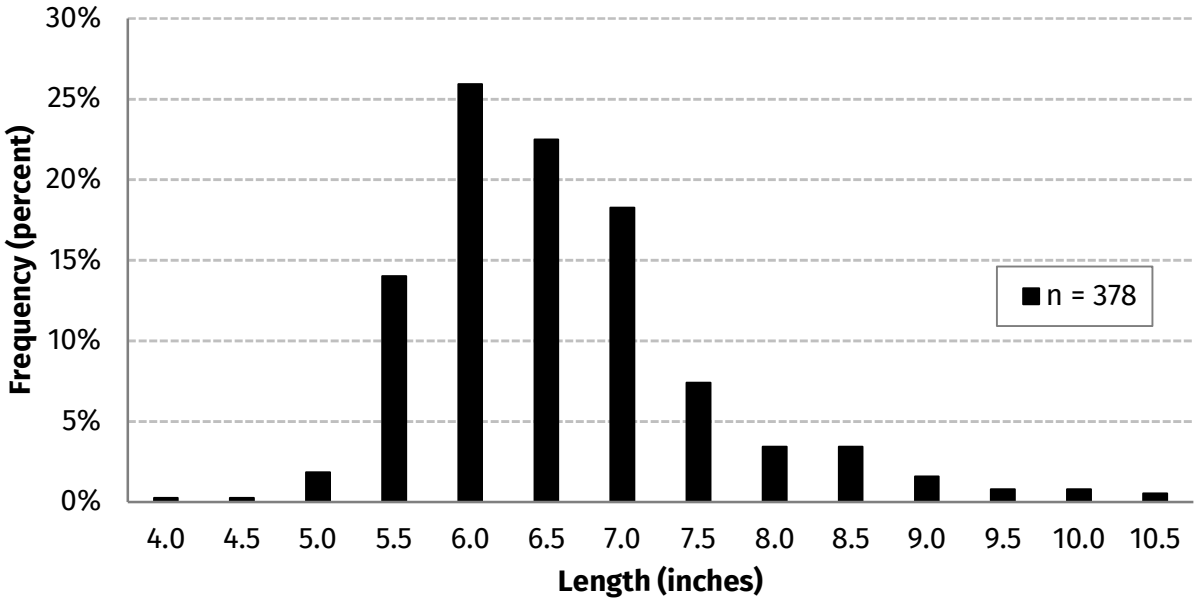


Figure 20. Length frequency distribution of yellow perch sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

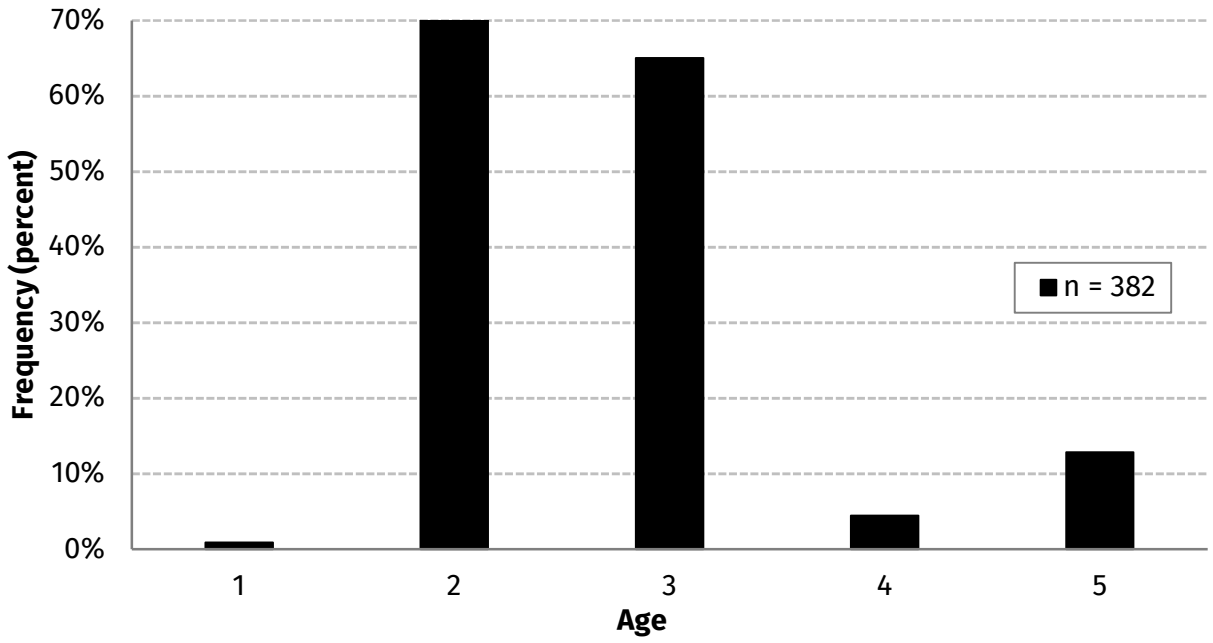


Figure 21. Age frequency distribution of yellow perch sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

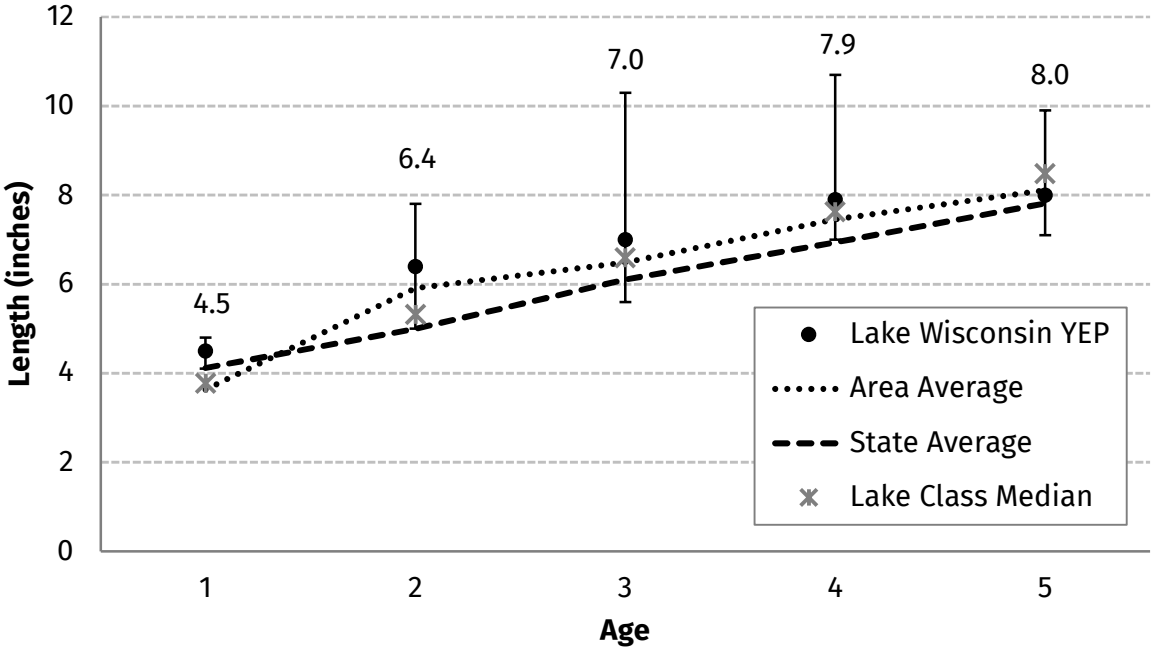


Figure 22. Mean length at age of yellow perch (YEP) sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

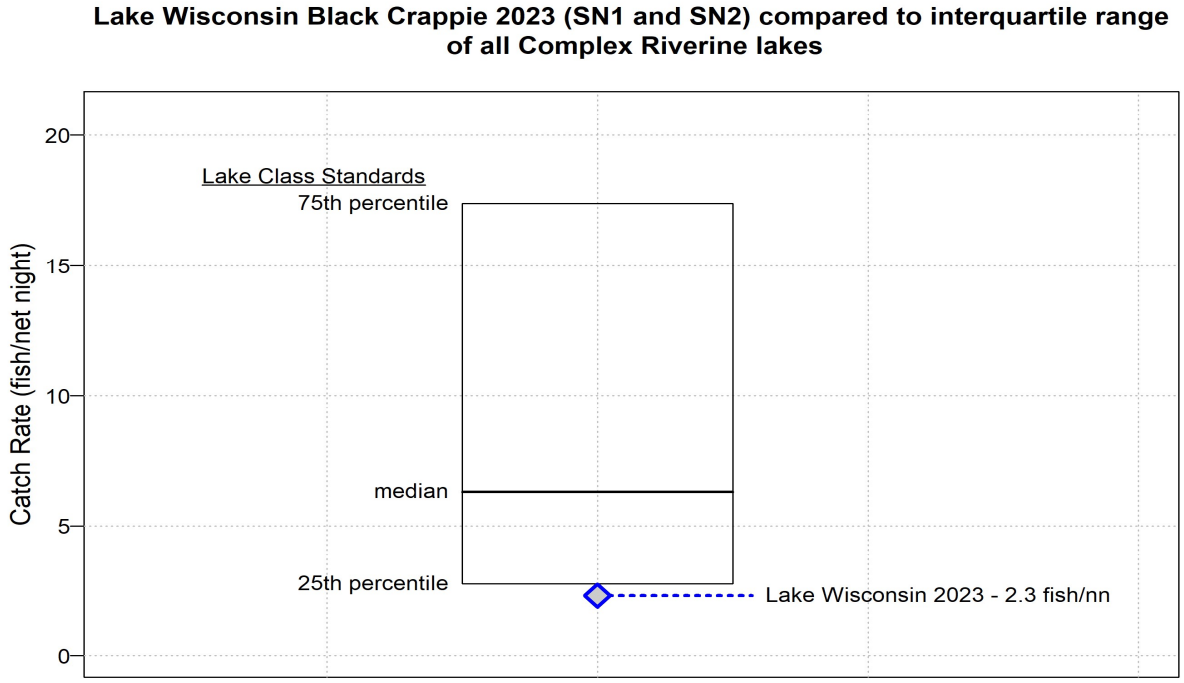


Figure 23. Yellow Perch SN1 and SN2 catch rate lake class comparison for Lake Wisconsin.

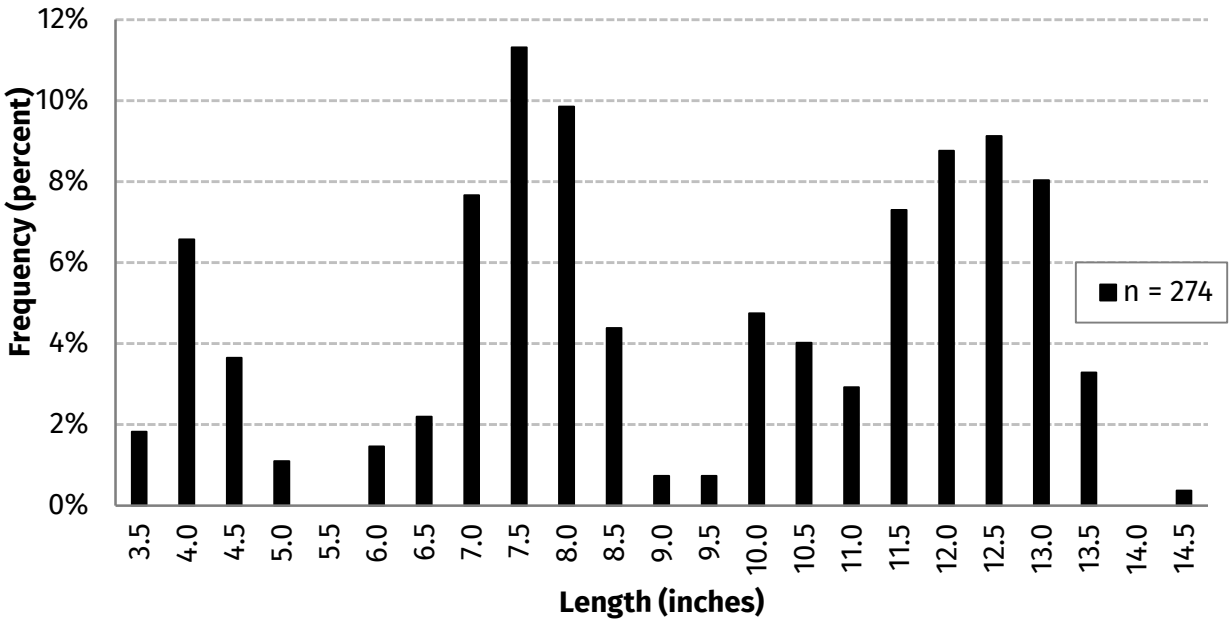


Figure 24. Length frequency distribution of black crappie sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

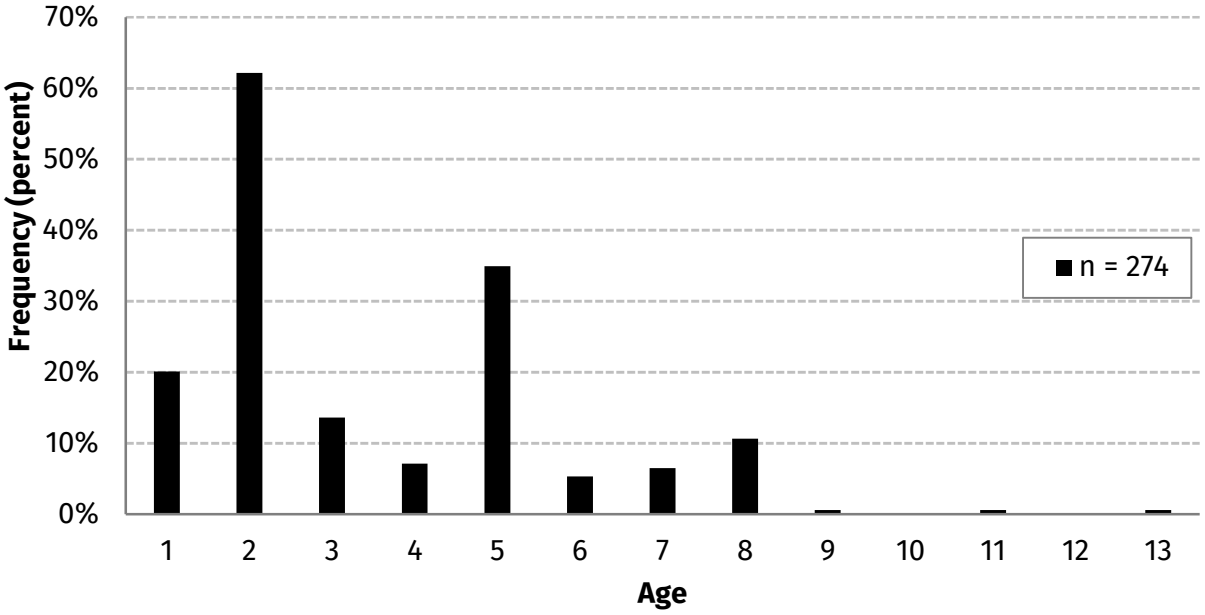


Figure 25. Age frequency distribution of black crappie sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

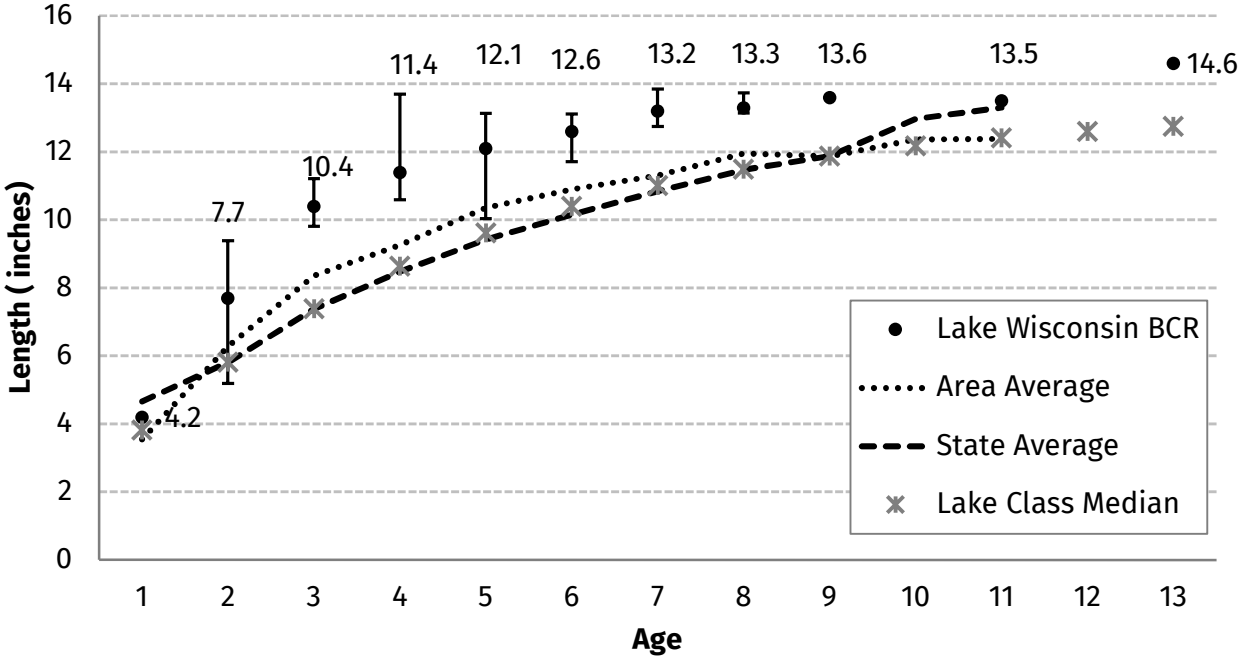


Figure 26. Mean length at age of black crappie (BCR) sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

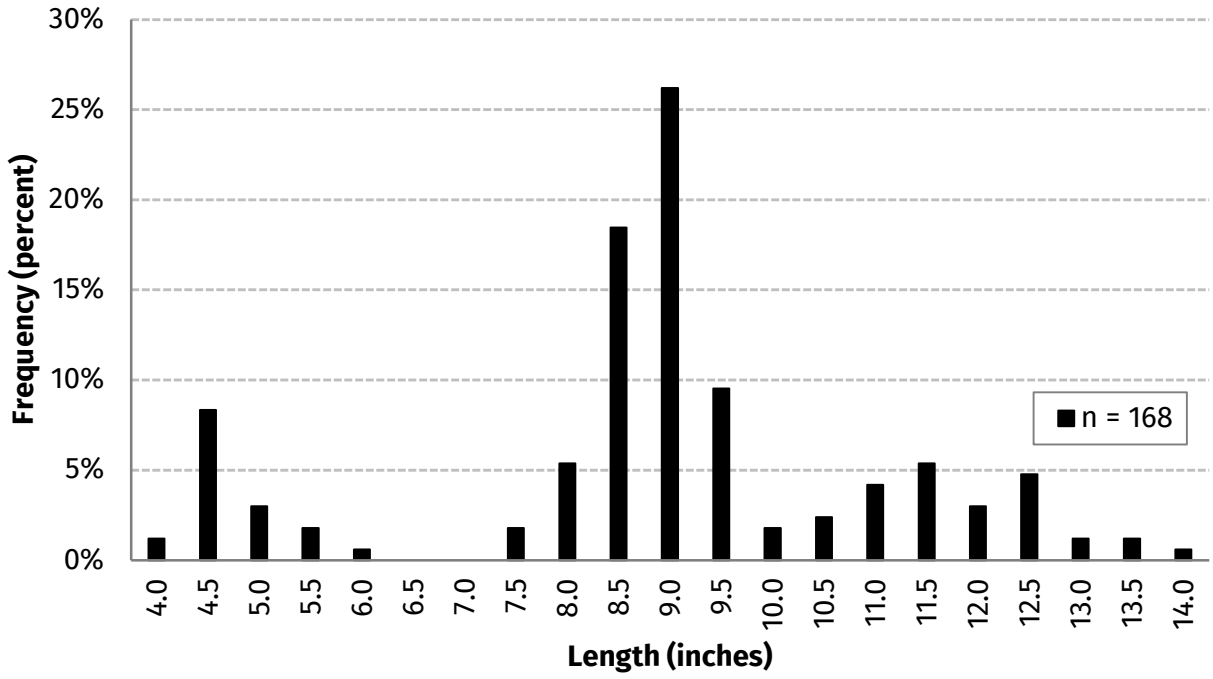


Figure 27. Length frequency distribution of white crappie sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

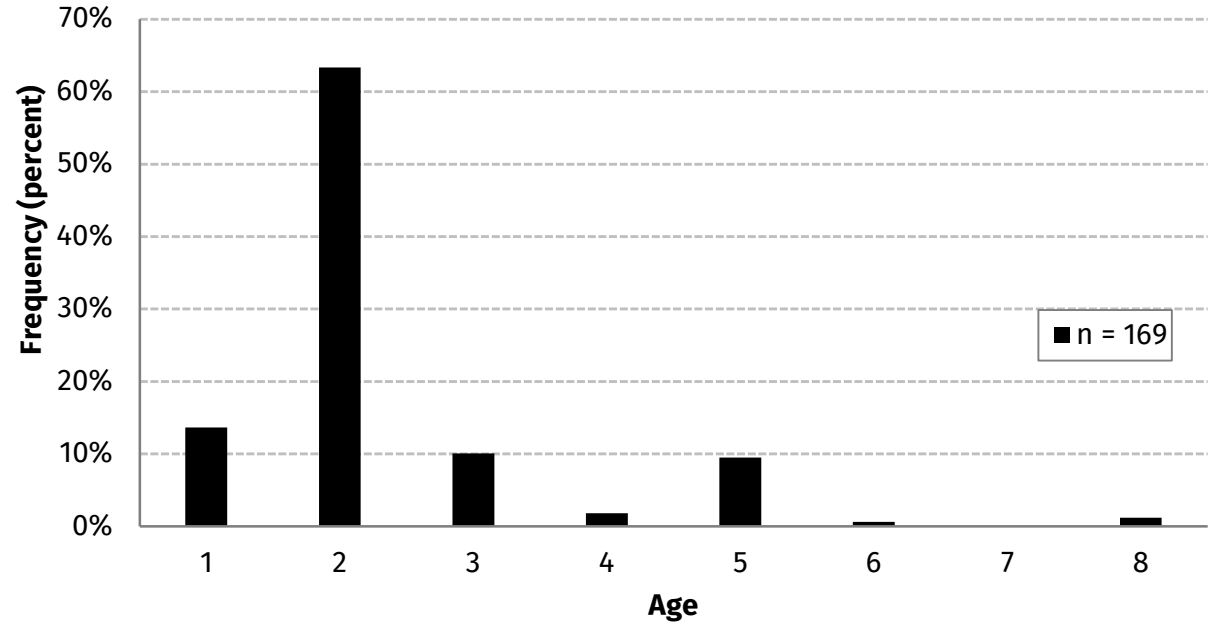


Figure 28. Age frequency distribution of white crappie sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

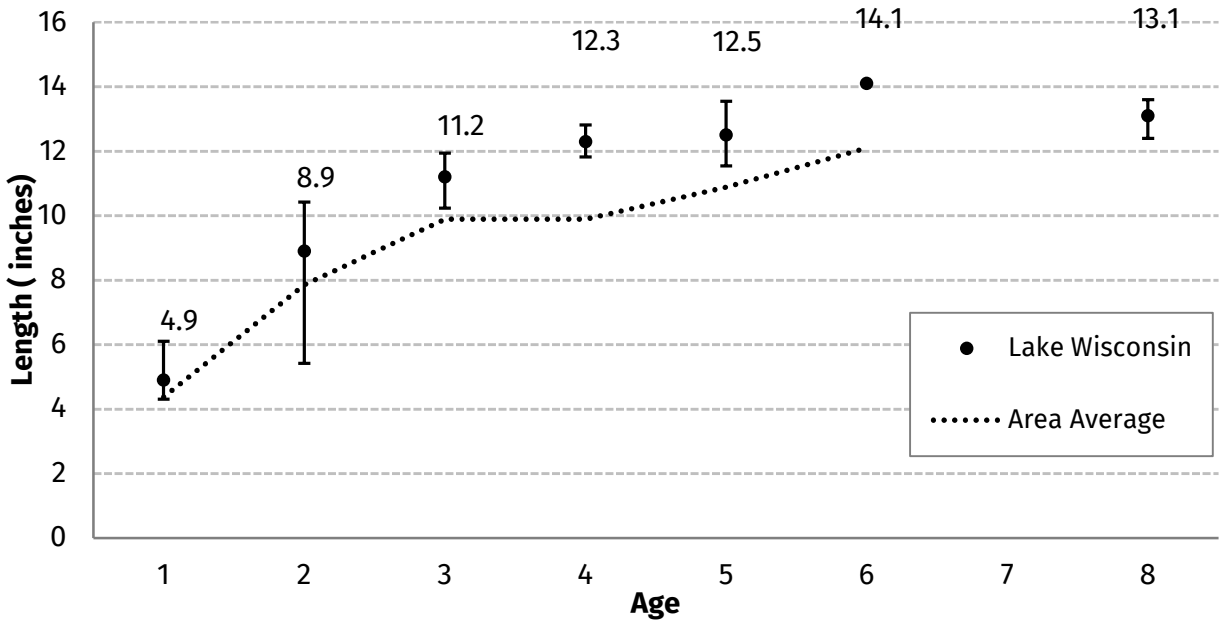


Figure 29. Mean length at age of white crappie sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

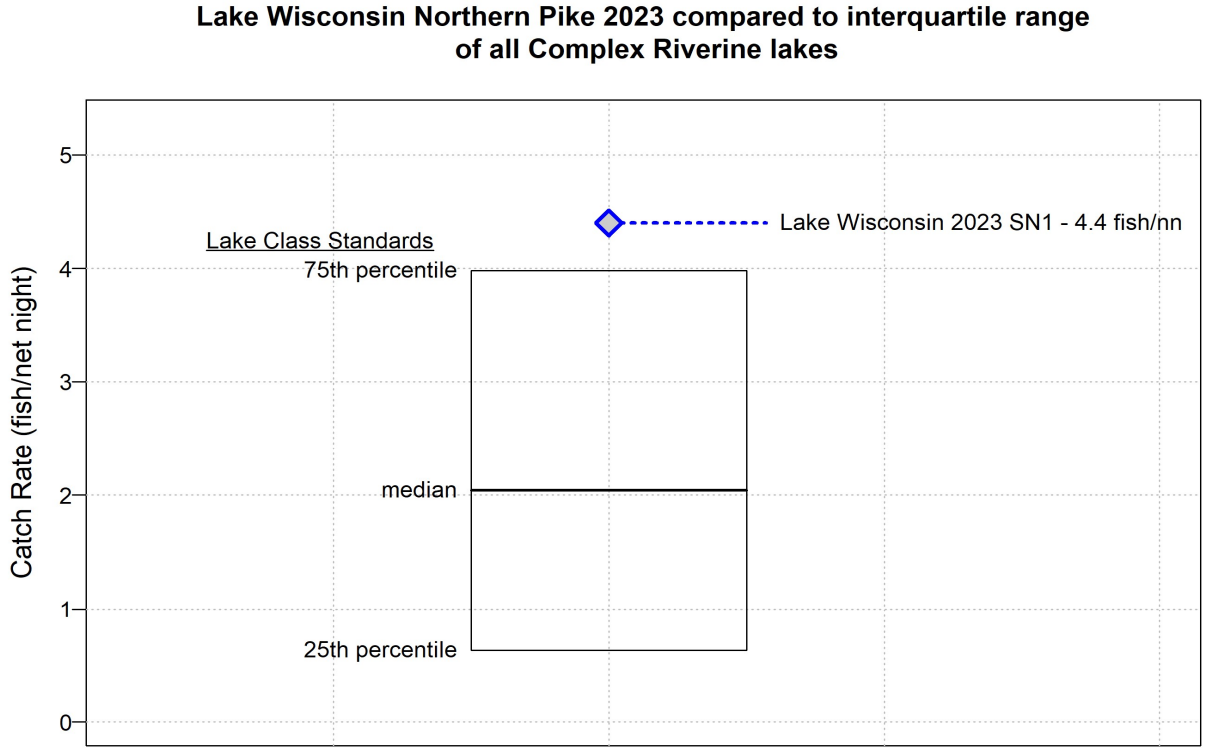


Figure 30. Northern pike catch rate lake class comparison for Lake Wisconsin.

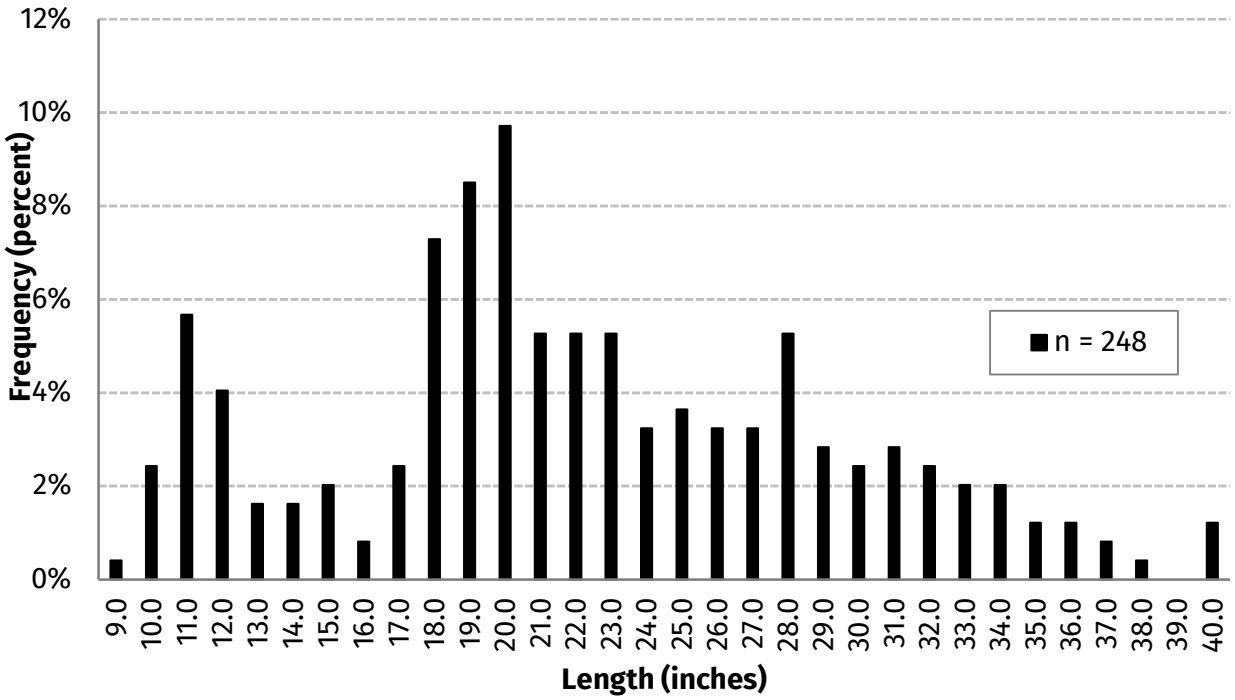


Figure 31. Length frequency distribution of northern pike sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

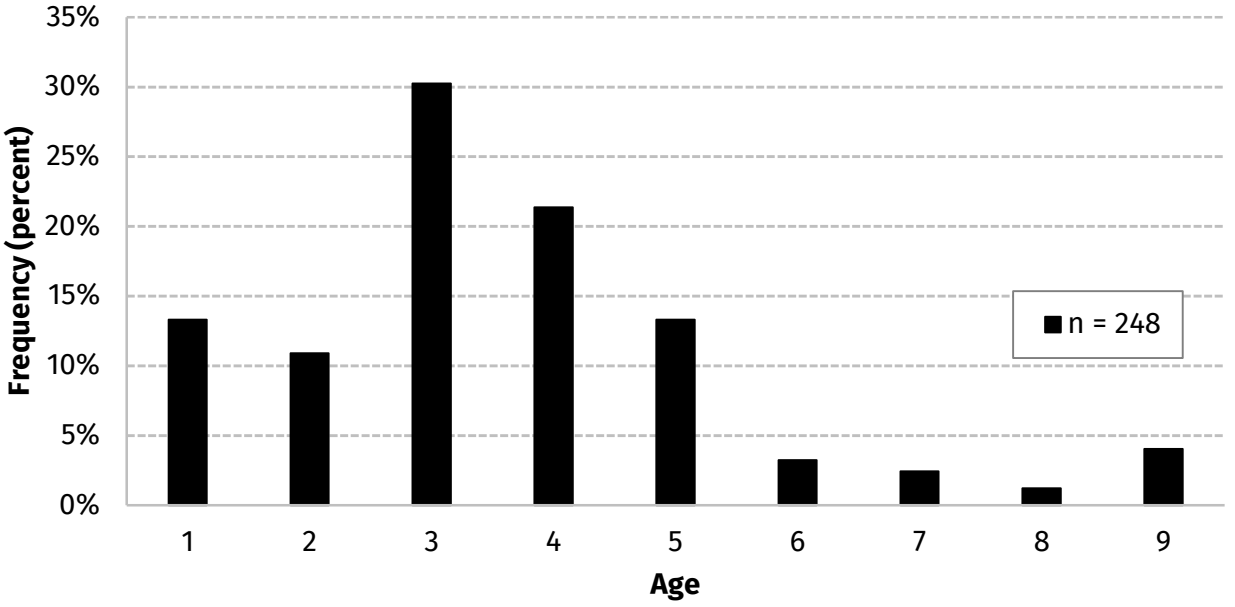


Figure 32. Age frequency distribution of northern pike sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

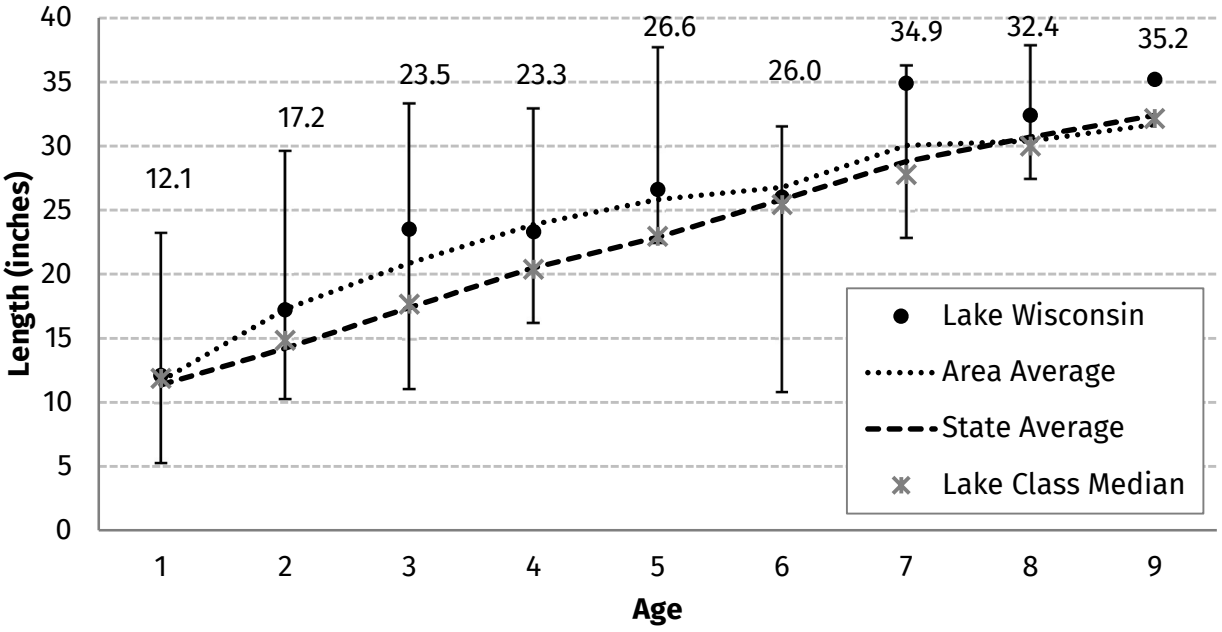


Figure 33. Mean length at age of northern pike sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

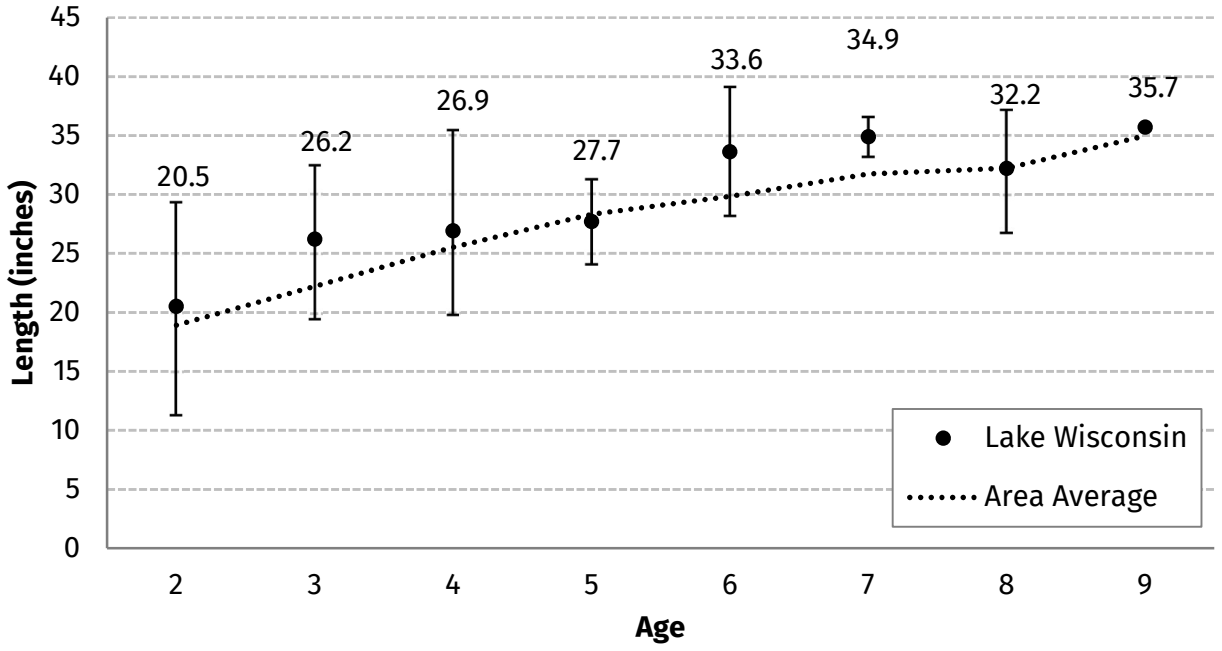


Figure 34. Mean length at age of female northern pike sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

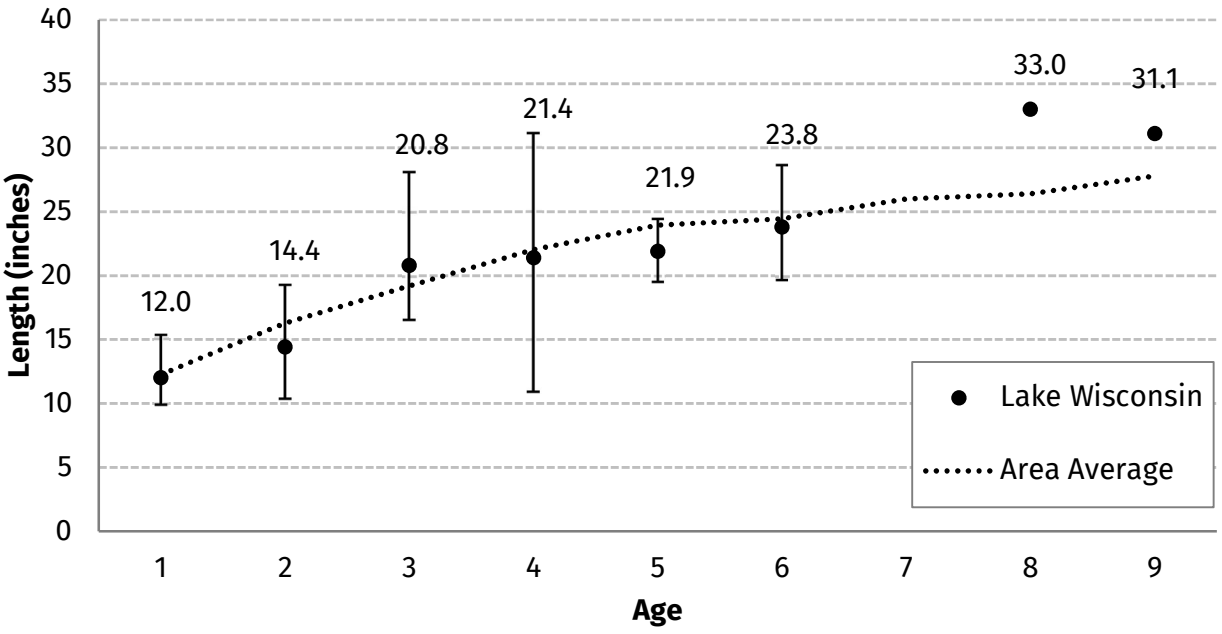


Figure 35. Mean length at age of male northern pike sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

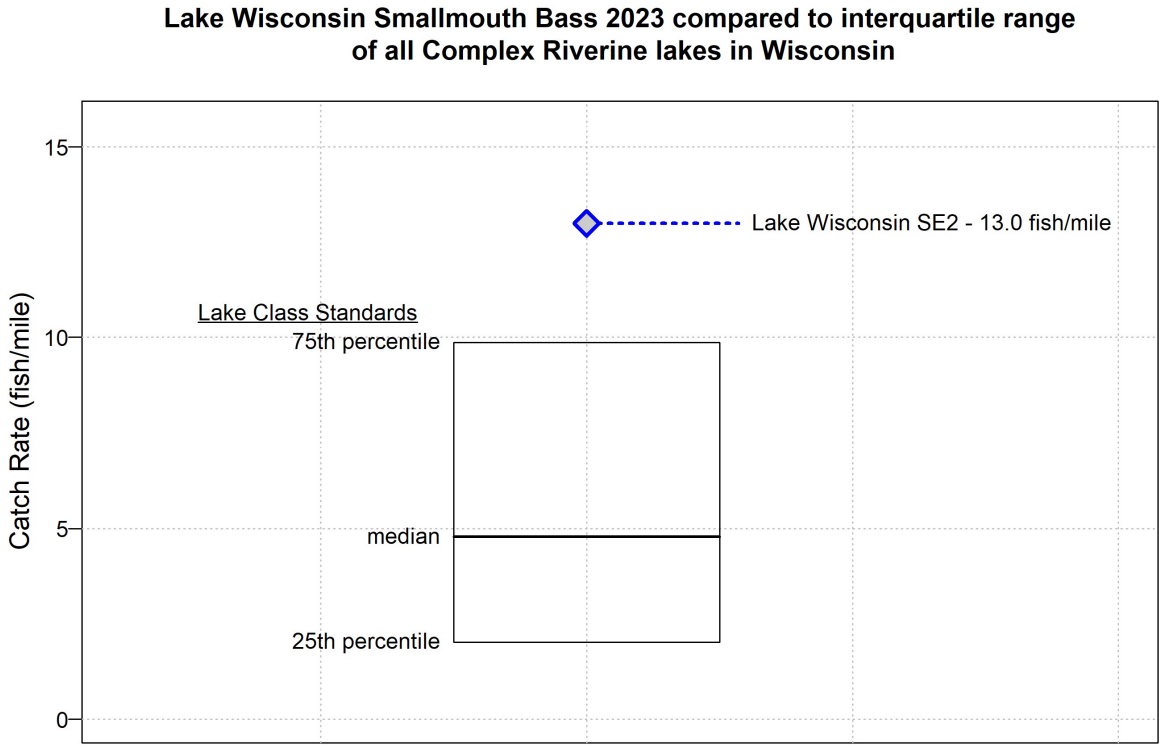


Figure 36. Smallmouth bass catch rate lake class comparison for Lake Wisconsin.

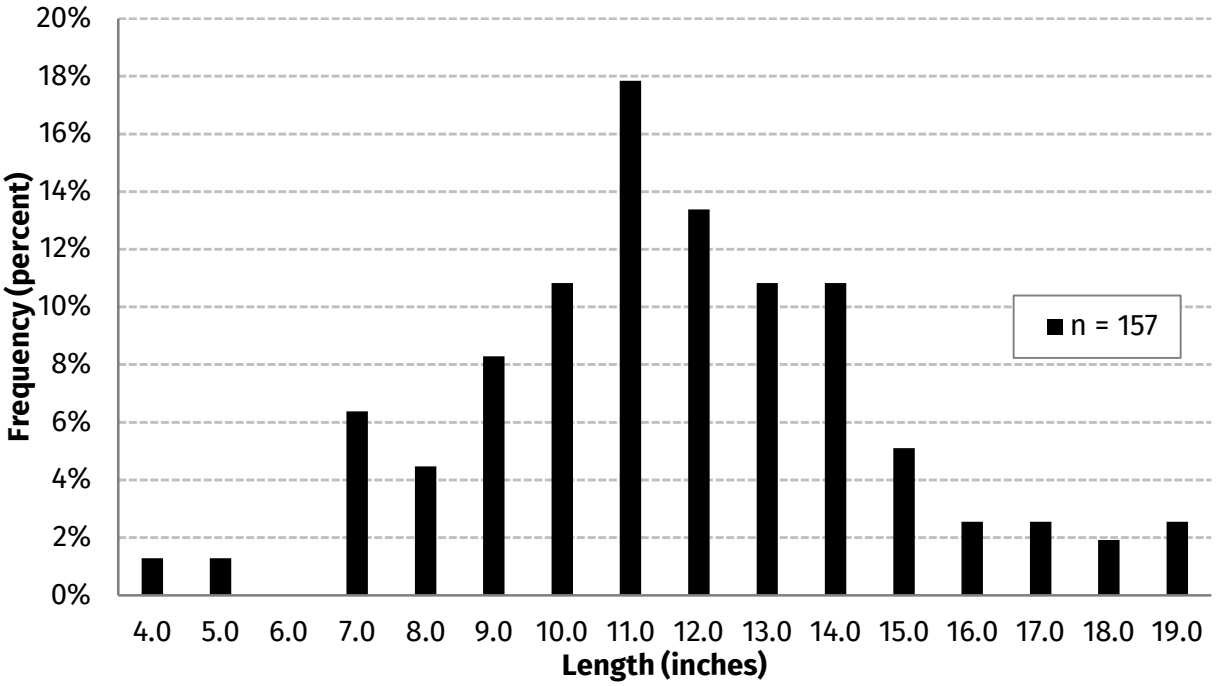


Figure 37. Length frequency distribution of smallmouth bass sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

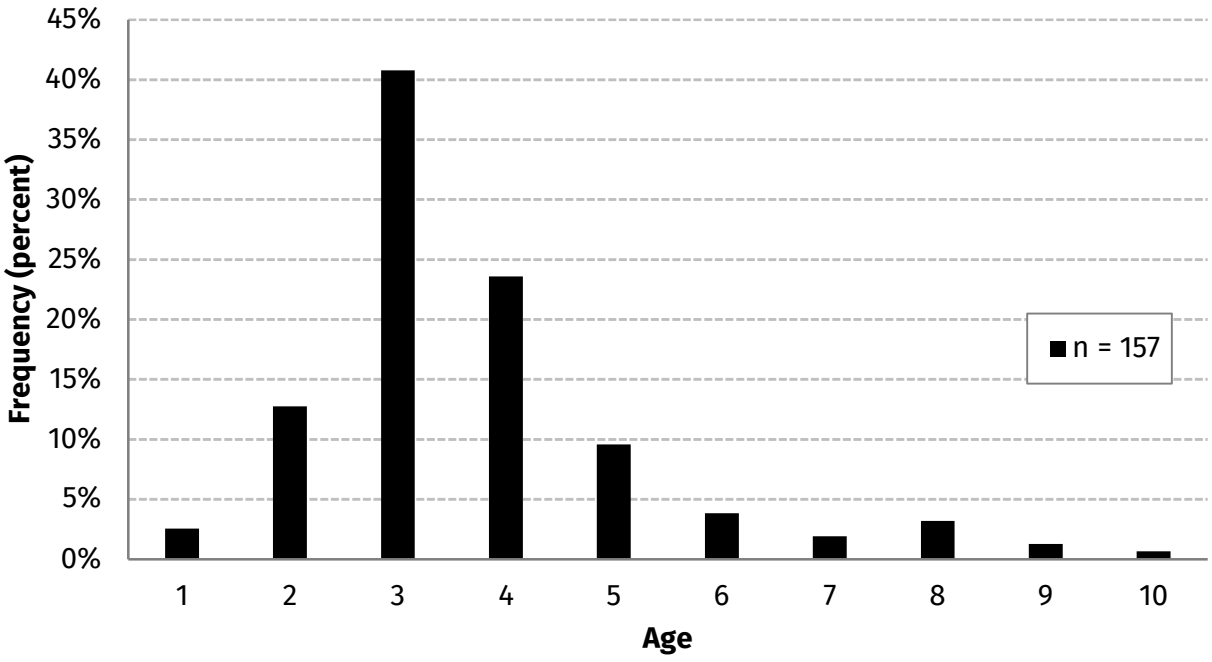


Figure 38. Age frequency distribution of smallmouth bass sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

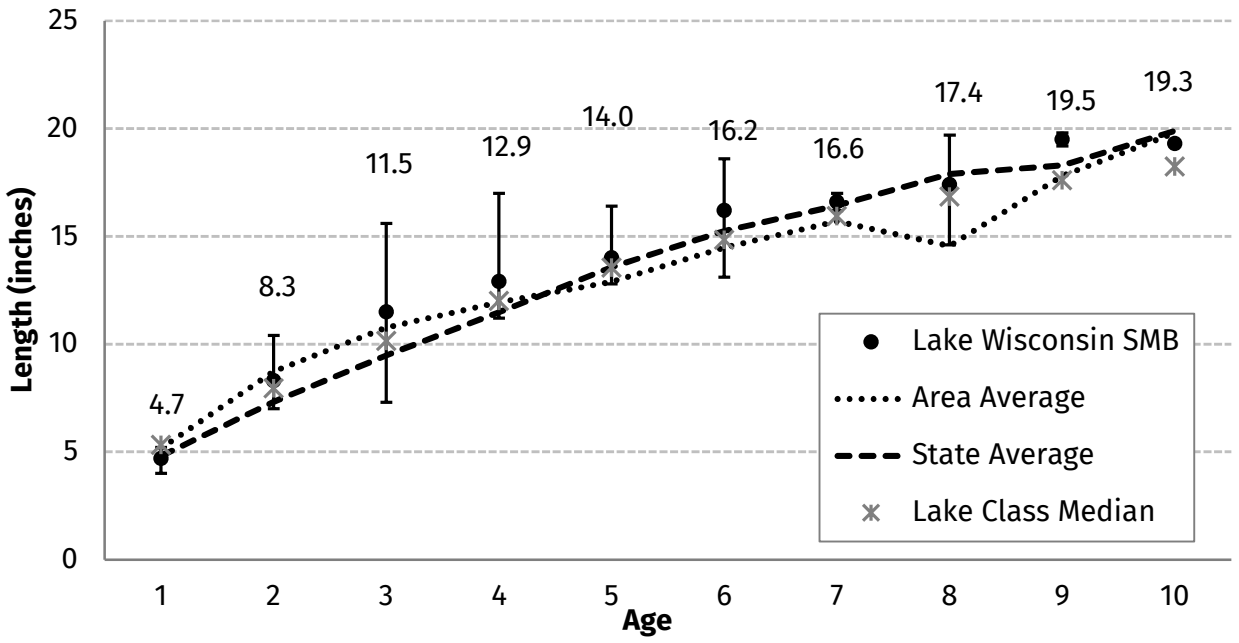


Figure 39. Mean length at age of smallmouth bass (SMB) sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

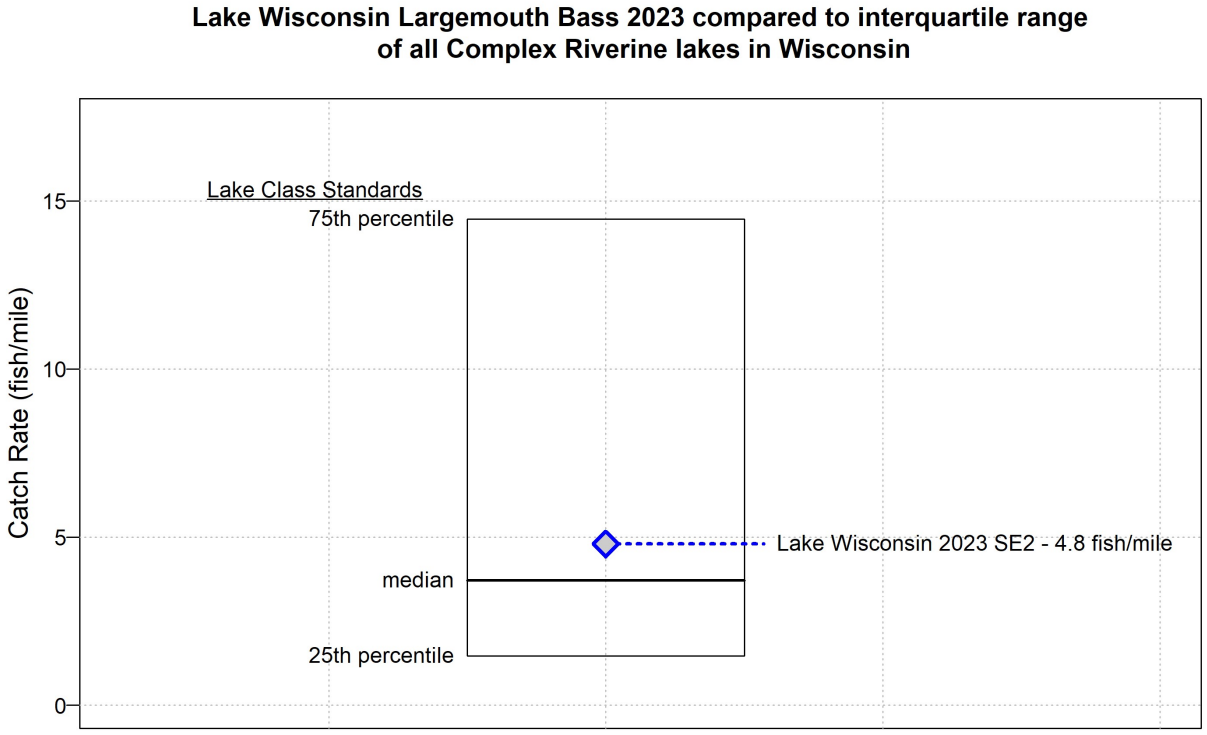


Figure 40. Largemouth bass catch rate lake class comparison for Lake Wisconsin.

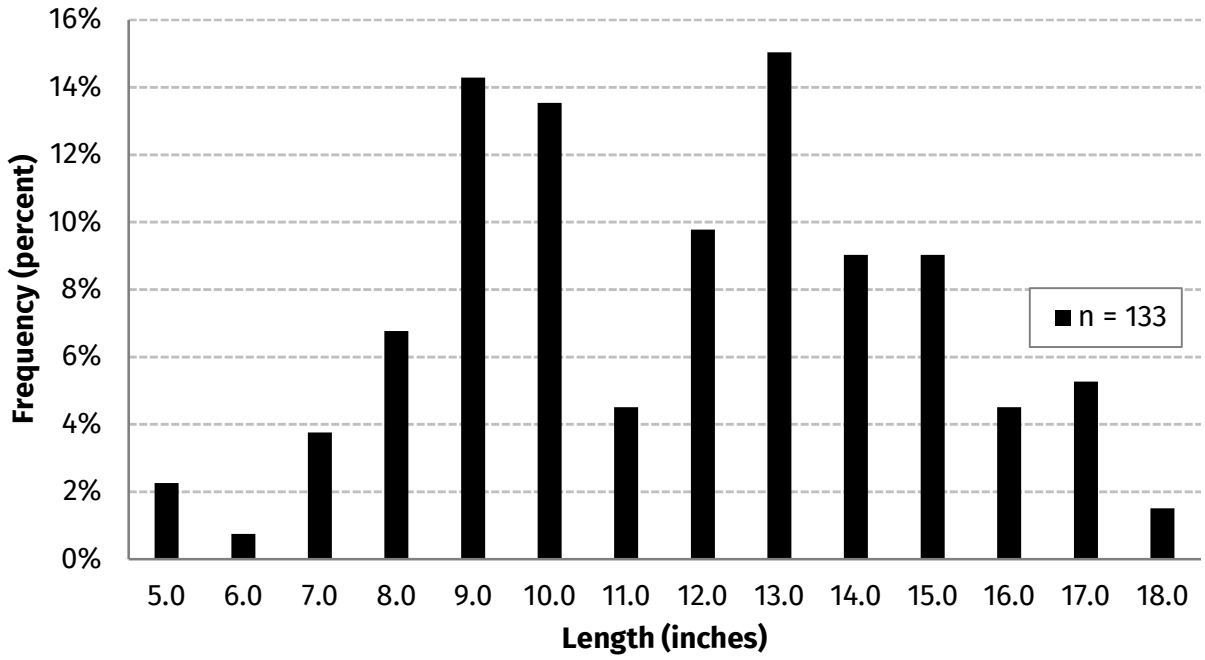


Figure 41. Length frequency distribution of largemouth bass sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

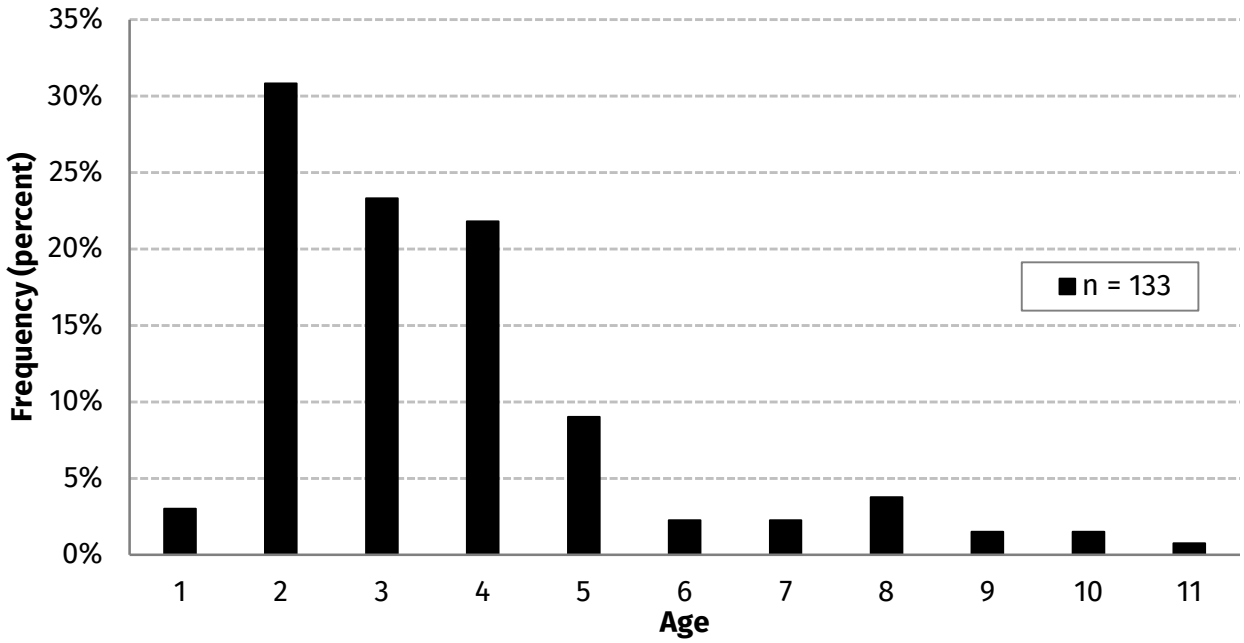


Figure 42. Age frequency distribution of largemouth bass sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

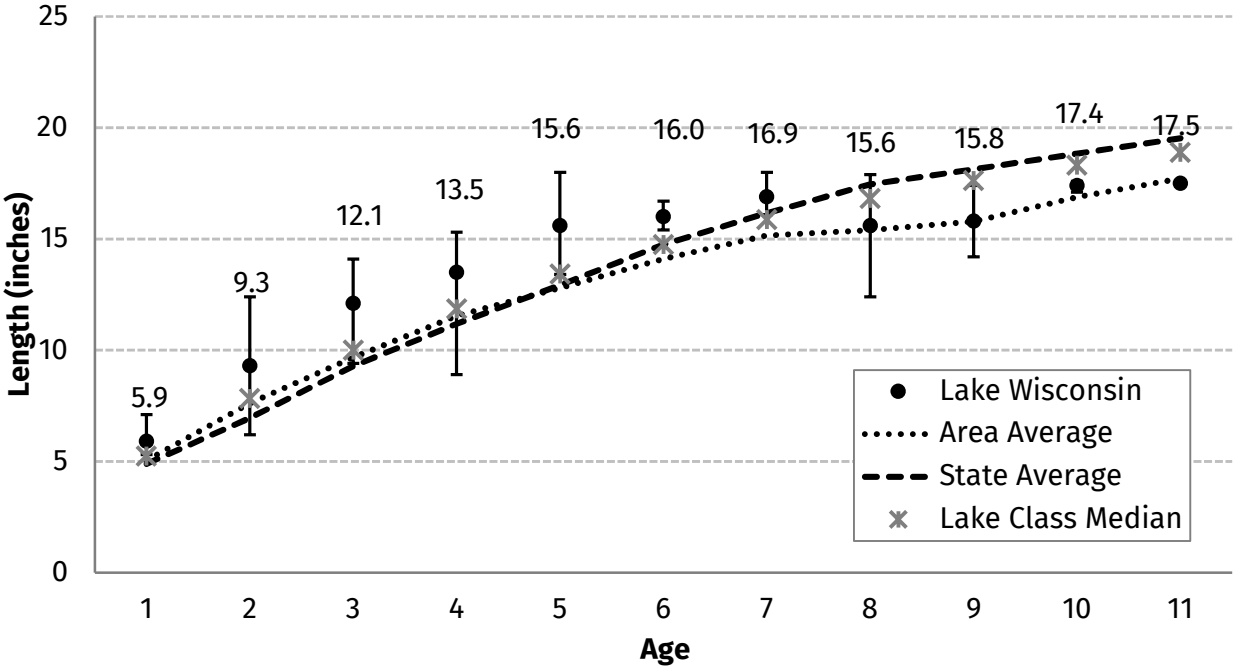


Figure 43. Mean length at age of largemouth bass (LMB) sampled during the 2023 comprehensive fishery survey of Lake Wisconsin.

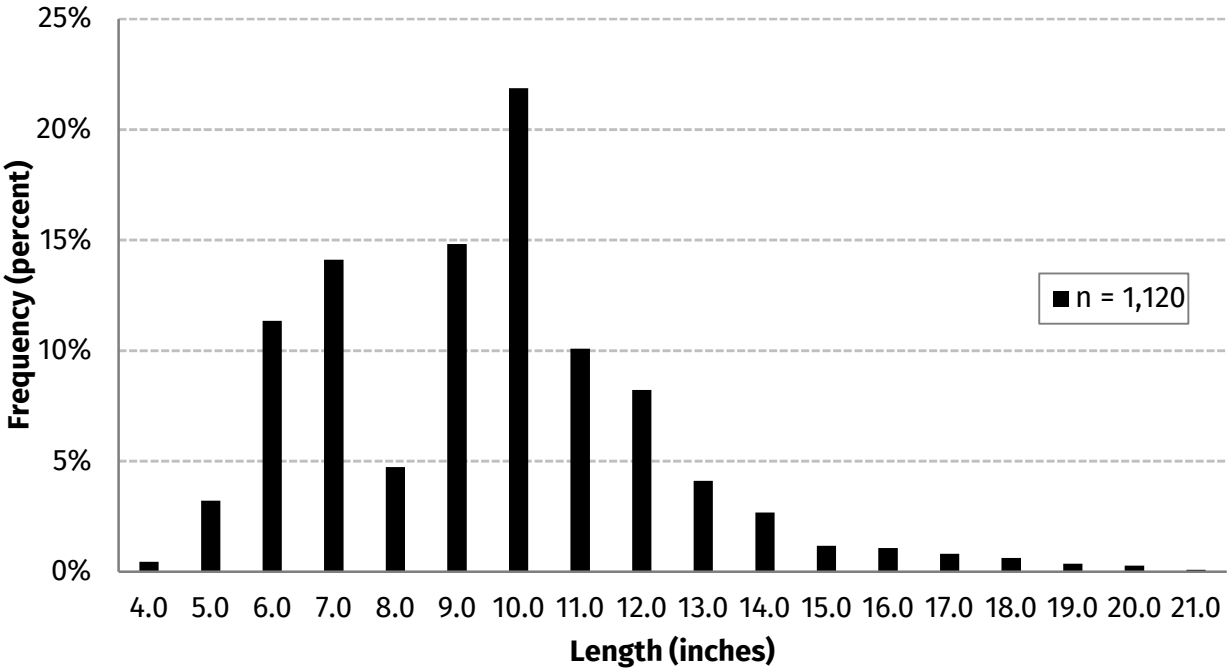


Figure 44. Length frequency distribution of sauger sampled during the fall 2023 electrofishing survey of Lake Wisconsin.

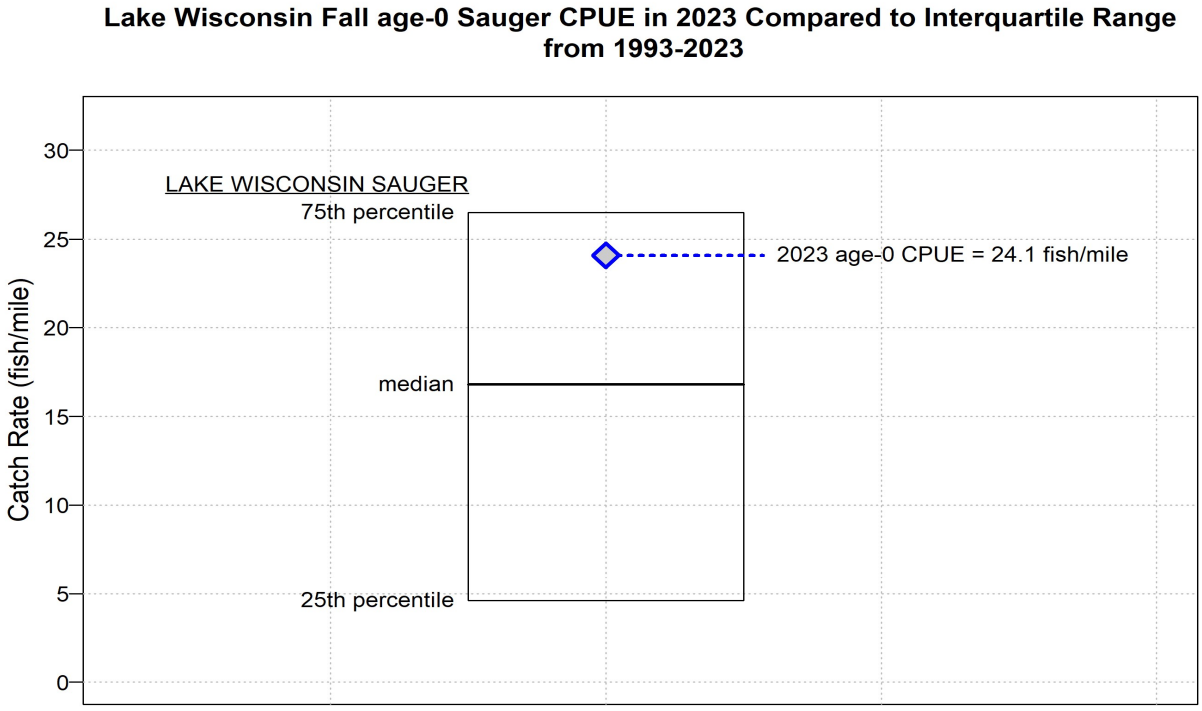


Figure 45. Catch rate of age-0 sauger (age-0 CPUE) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall age-0 CPUE for Lake Wisconsin, 1993-2023.

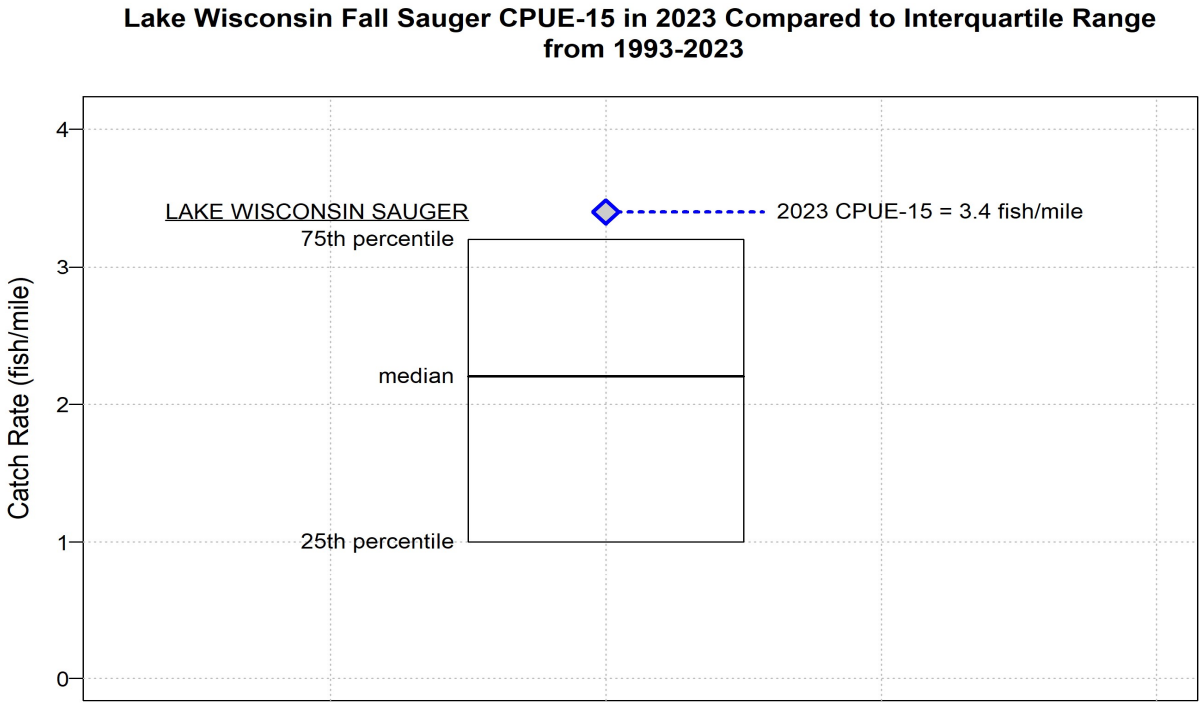


Figure 46. Catch rate of sauger ≥ 15 inches (CPUE-15) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-15 for Lake Wisconsin, 1993-2023.

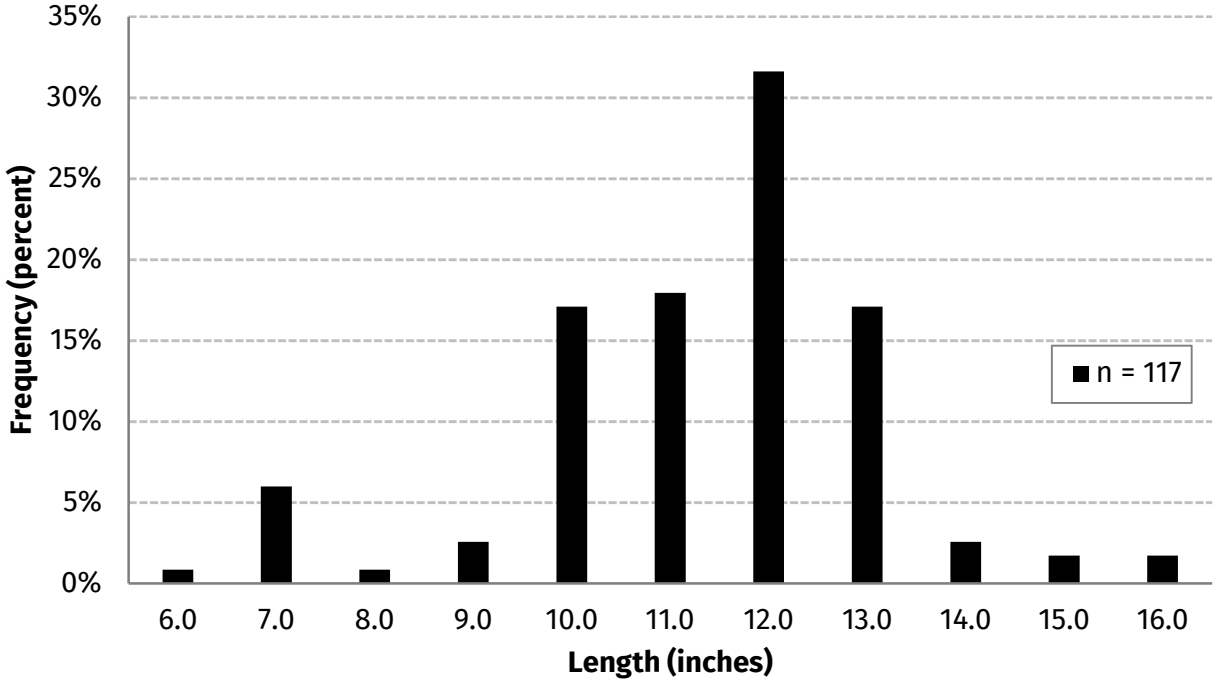


Figure 47. Length frequency distribution of sauger sampled during the fall 2023 electrofishing survey of the Kilbourn Dam tailwater of the Wisconsin River.

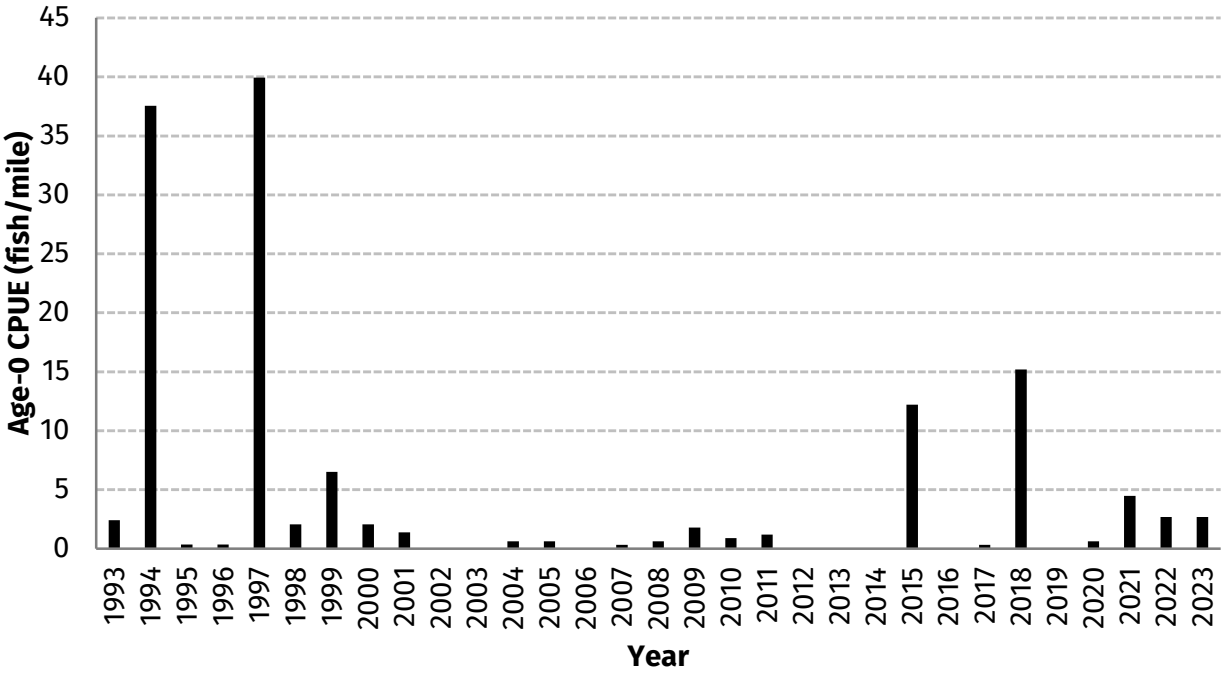


Figure 48. Catch rate of age-0 sauger (age-0 CPUE) in fall electrofishing surveys of the Kilbourn Dam tailwater of the Wisconsin River, 1993-2023.

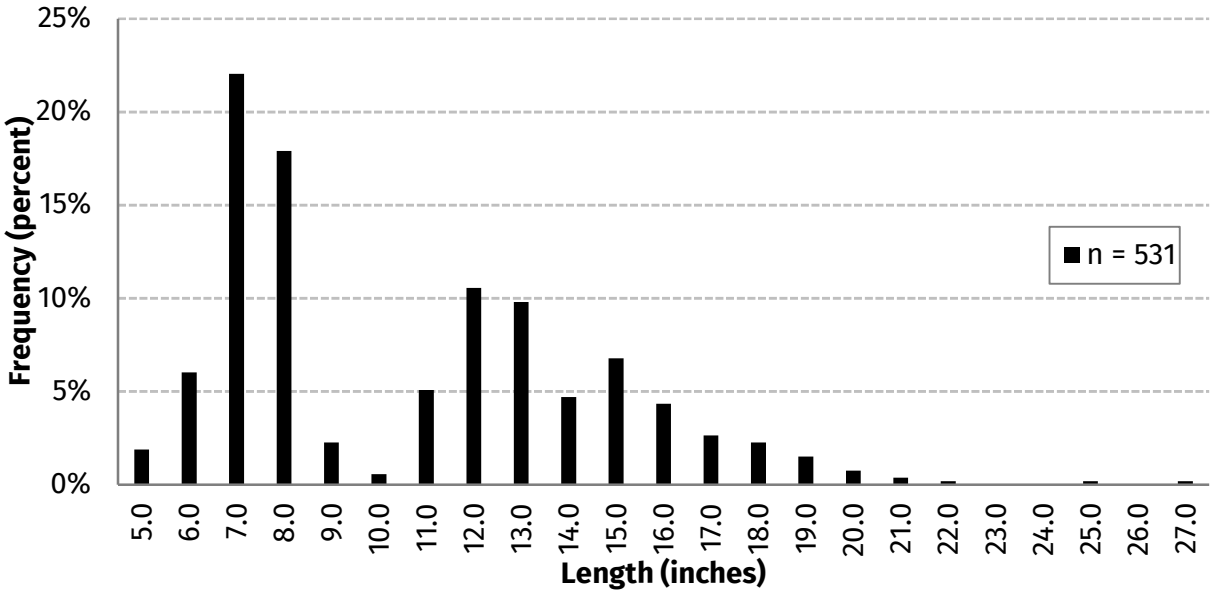


Figure 49. Length frequency distribution of walleye sampled during the fall 2023 electrofishing survey of Lake Wisconsin.

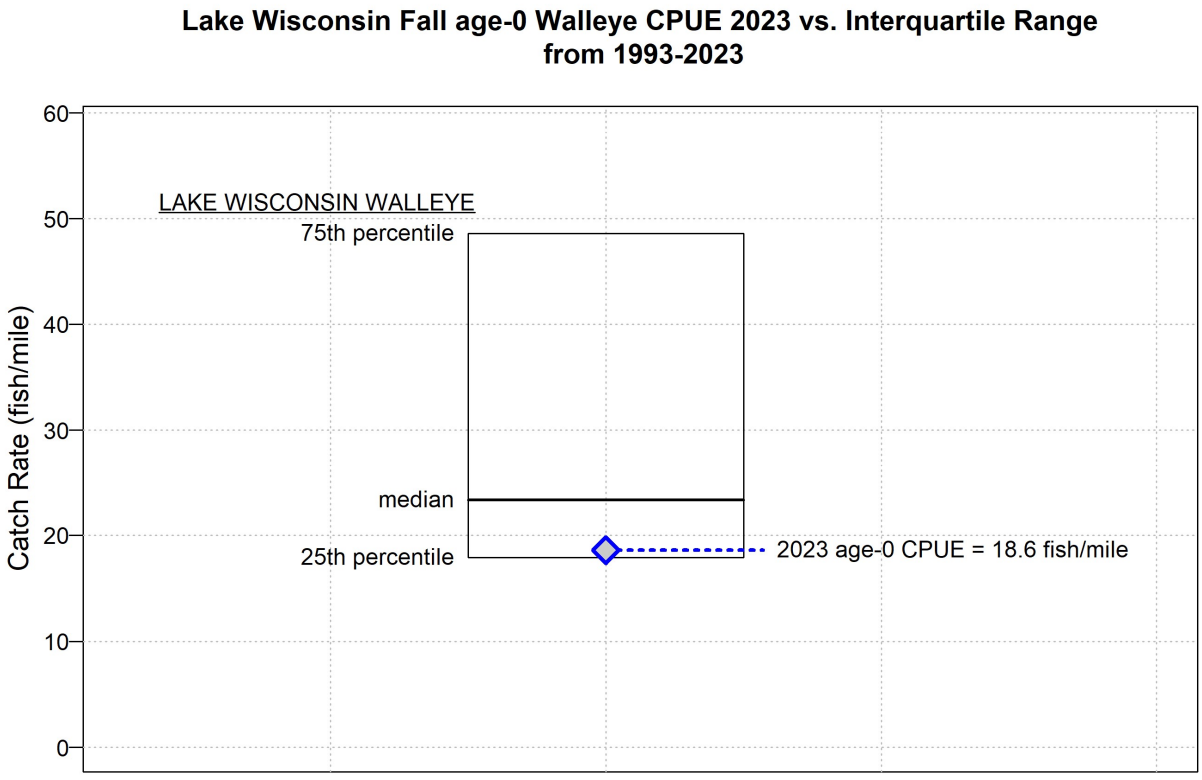


Figure 50. Catch rate of age-0 walleye (age-0 CPUE) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall age-0 CPUE for Lake Wisconsin, 1993-2023.

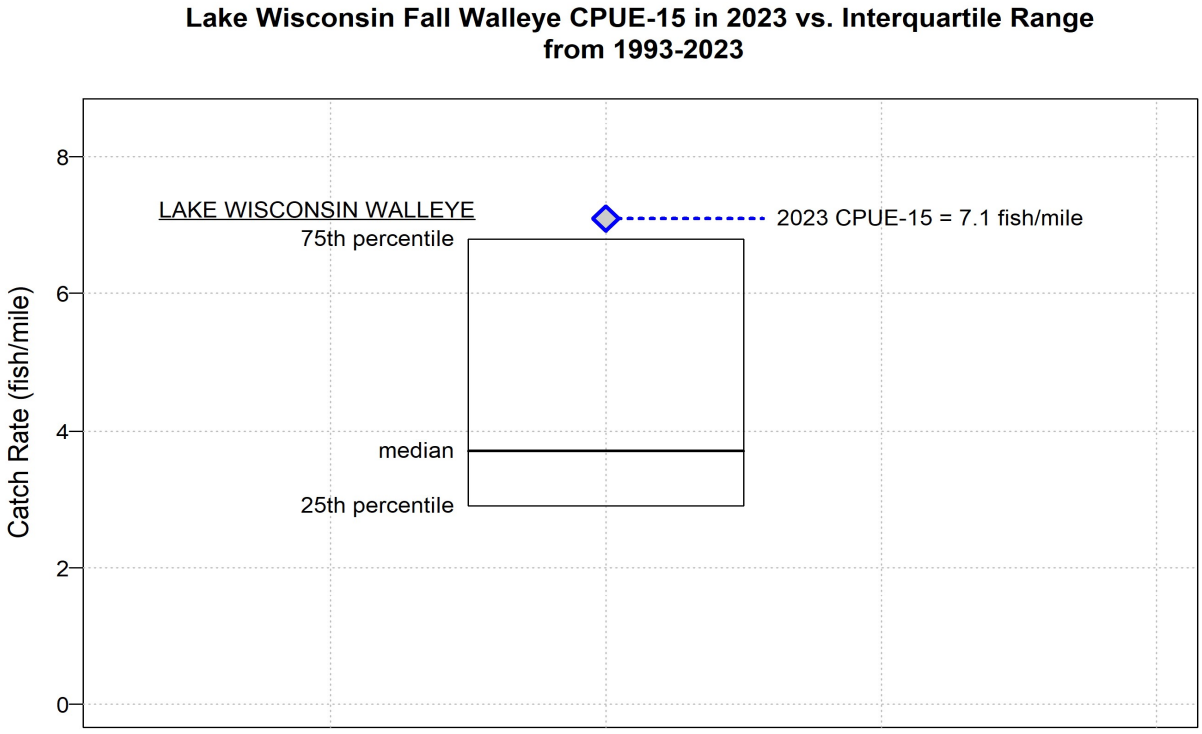


Figure 51. Catch rate of walleye ≥ 15 inches (CPUE-15) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-15 for Lake Wisconsin, 1993-2023.

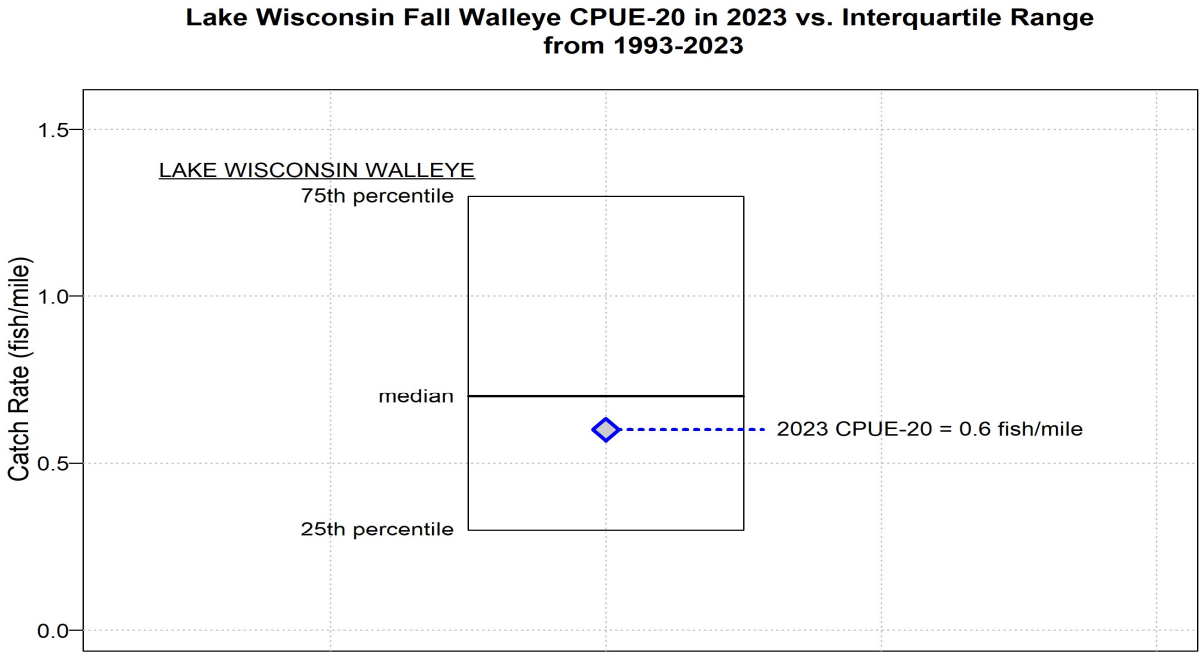


Figure 52. Catch rate of walleye ≥ 20 inches (CPUE-20) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-20 for Lake Wisconsin, 1993-2023.

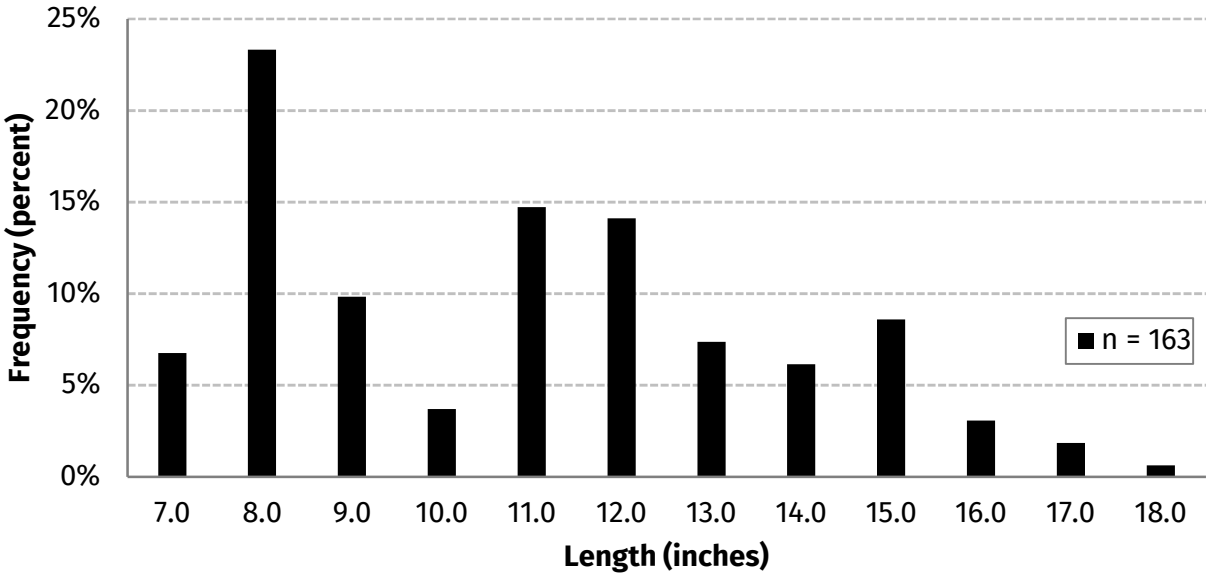


Figure 53. Length frequency distribution of walleye sampled during the fall 2023 electrofishing survey of the Kilbourn Dam tailwater of the Wisconsin River.

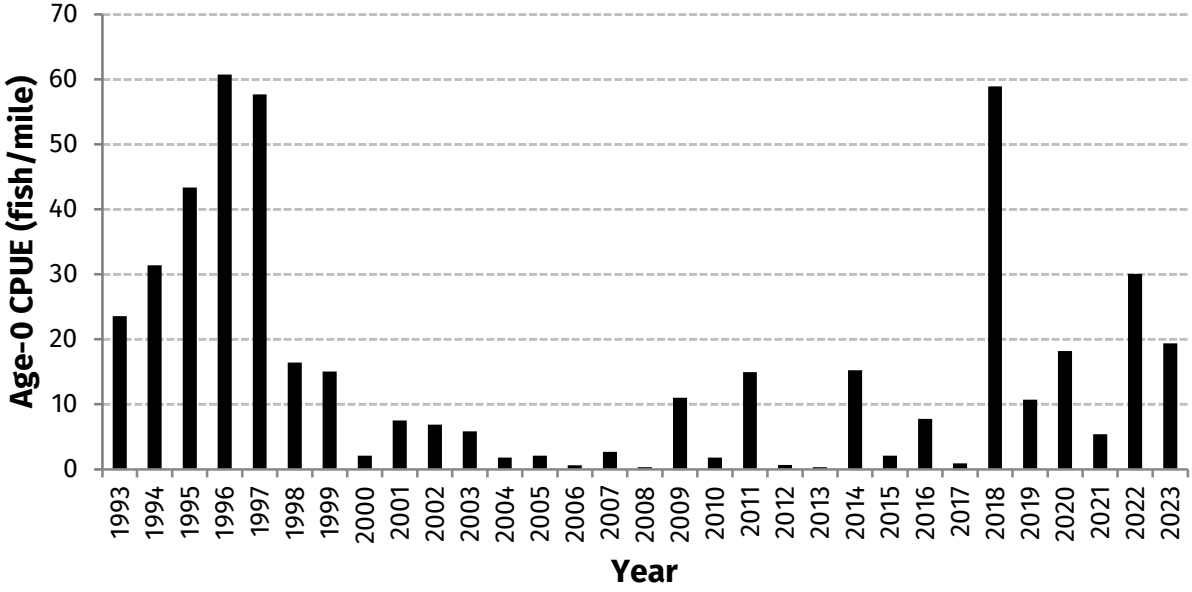


Figure 54. Catch rate of age-0 walleye (age-0 CPUE) in fall electrofishing surveys of the Kilbourn Dam tailwater of the Wisconsin River, 1993-2023.

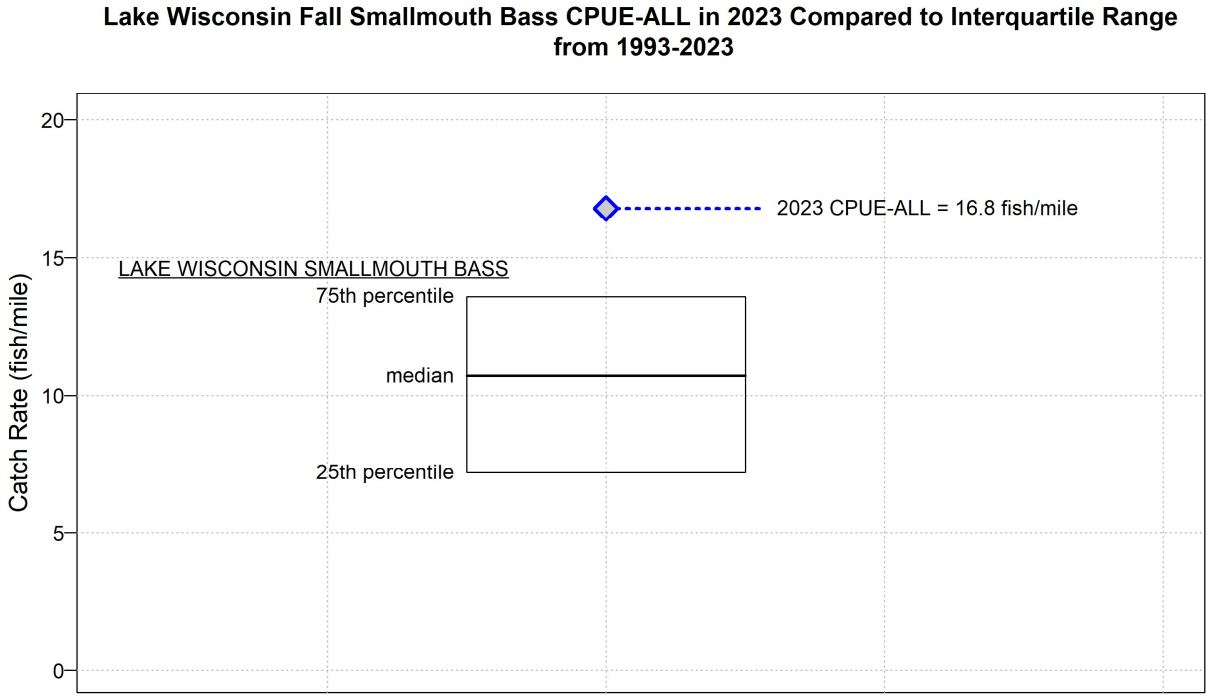


Figure 55. Catch rate of smallmouth bass (CPUE-ALL) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-ALL for Lake Wisconsin, 1993-2023.

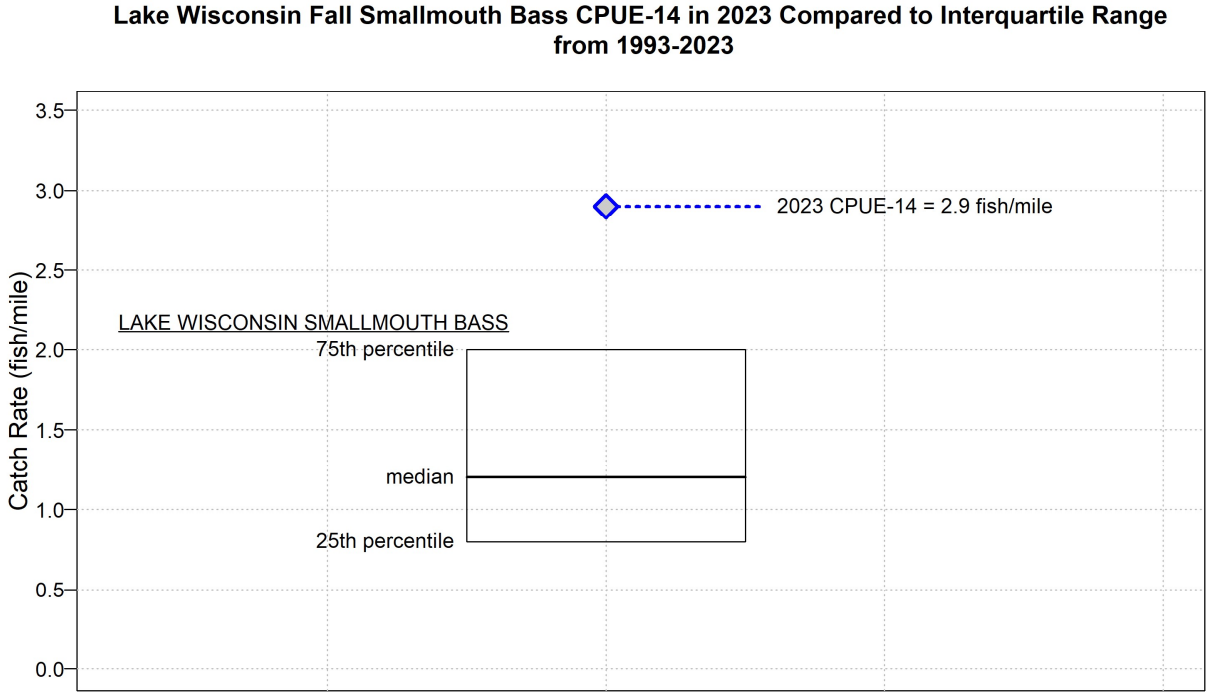


Figure 56. Catch rate of smallmouth bass ≥ 14 inches (CPUE-14) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-14 for Lake Wisconsin, 1993-2023.

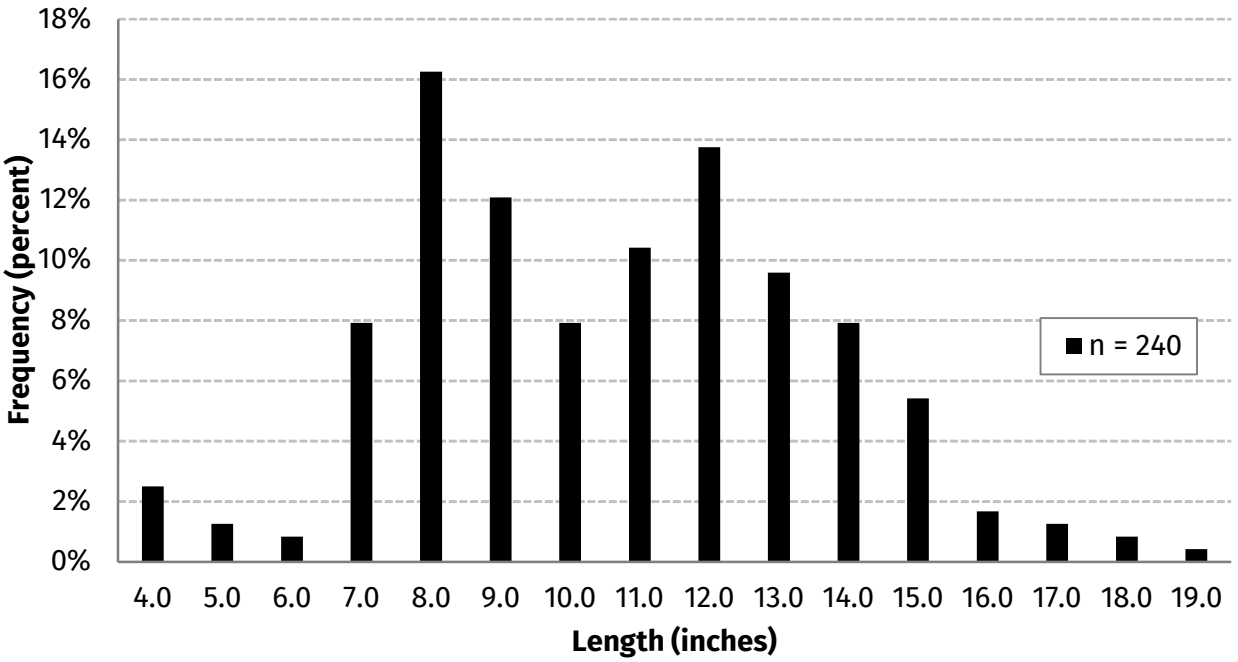


Figure 57. Length frequency distribution of smallmouth bass sampled during the fall 2023 electrofishing survey of Lake Wisconsin.

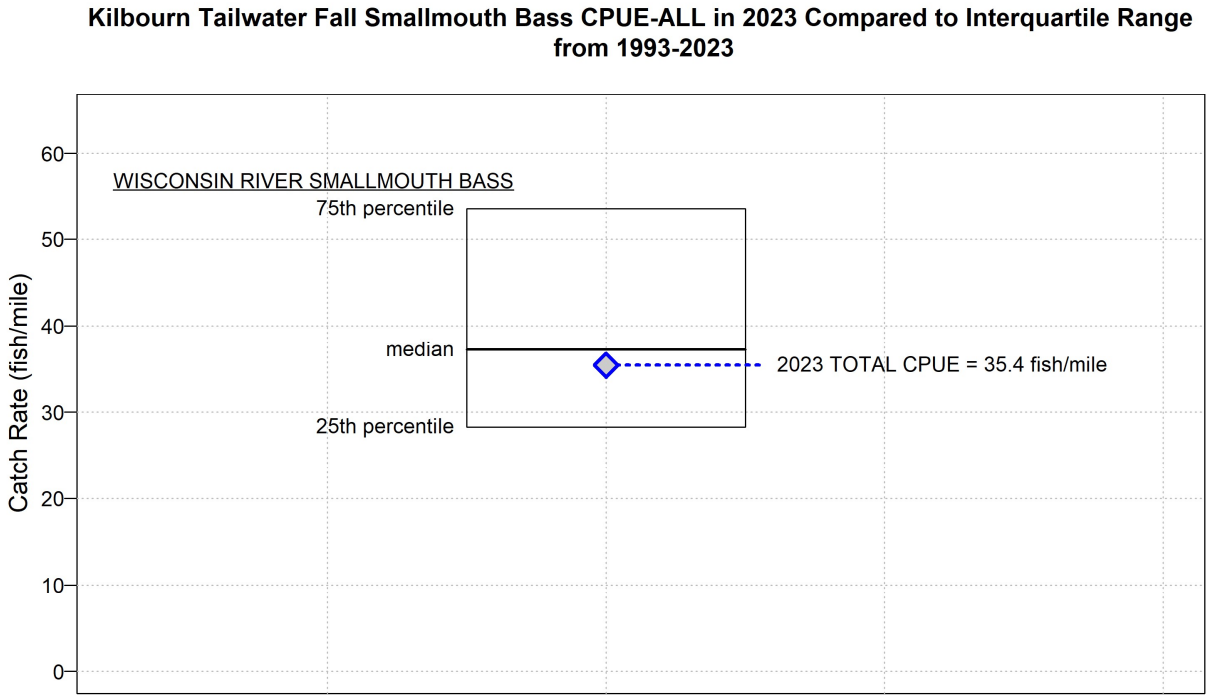


Figure 58. Catch rate of smallmouth bass (CPUE-ALL) in the fall 2023 electrofishing survey of the Kilbourn Dam tailwater of the Wisconsin River compared to the interquartile range of fall CPUE-ALL for the tailwater survey, 1993-2023.

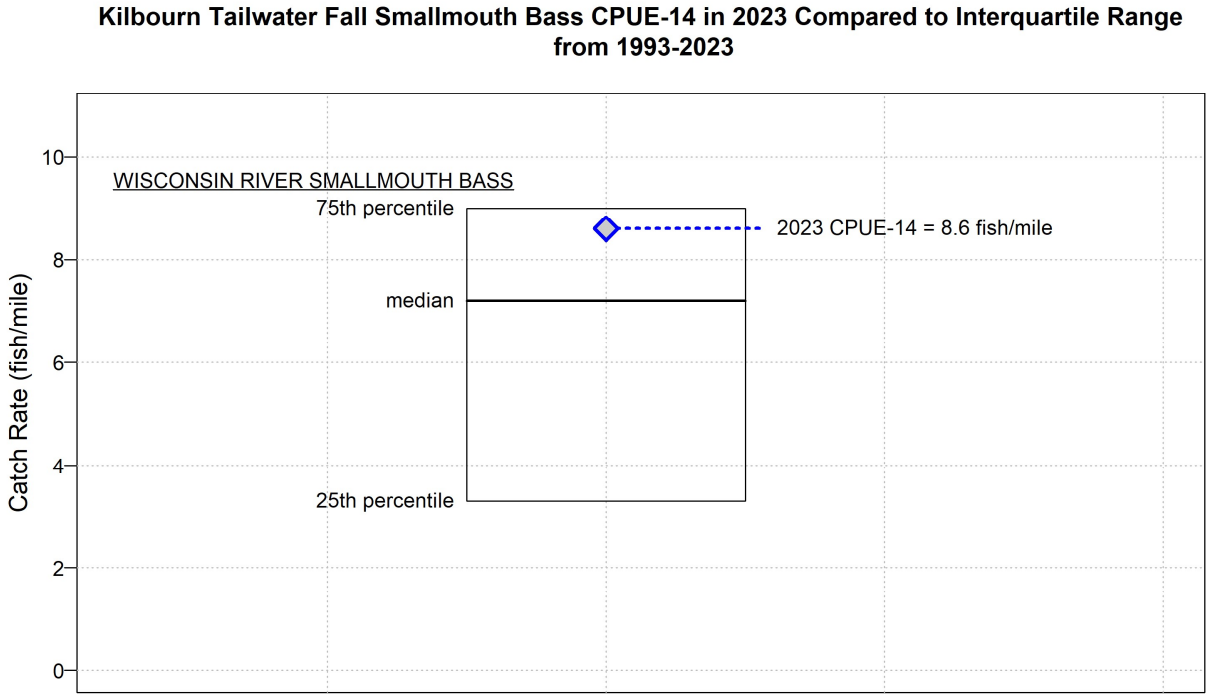


Figure 59. Catch rate of smallmouth bass ≥ 14 inches (CPUE-14) in the fall 2023 electrofishing survey of the Kilbourn Dam tailwater of the Wisconsin River compared to the interquartile range of fall CPUE-14 for the tailwater survey, 1993-2023.

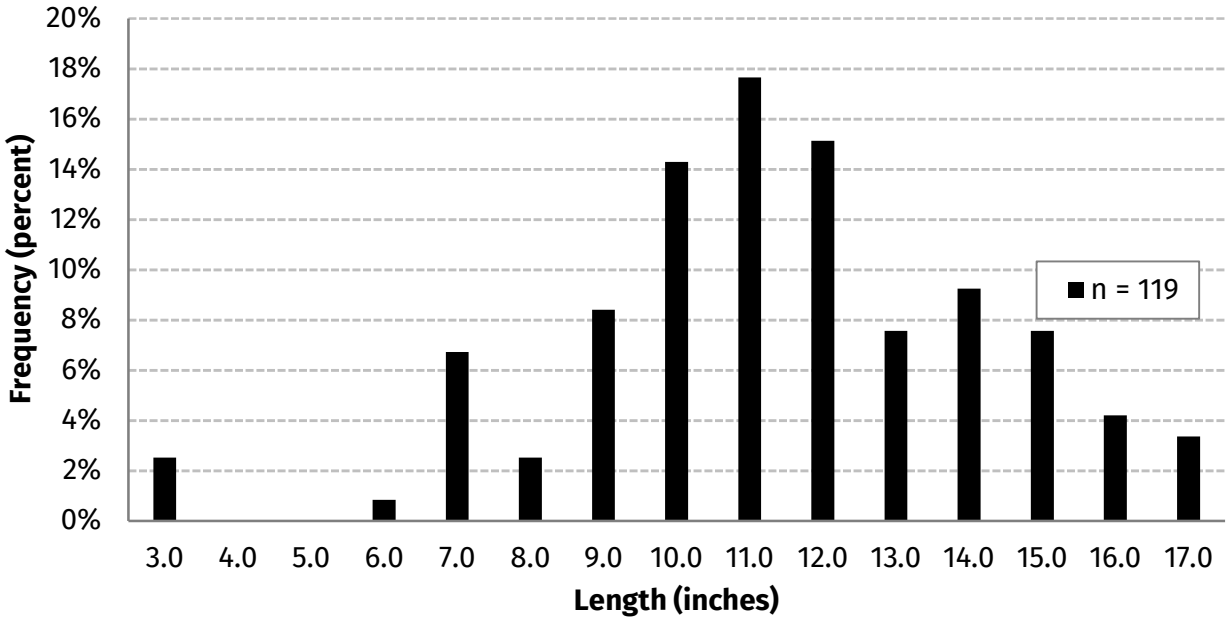


Figure 60. Length frequency distribution of smallmouth bass sampled during the fall 2023 electrofishing survey of the Kilbourn Dam tailwater of the Wisconsin River.

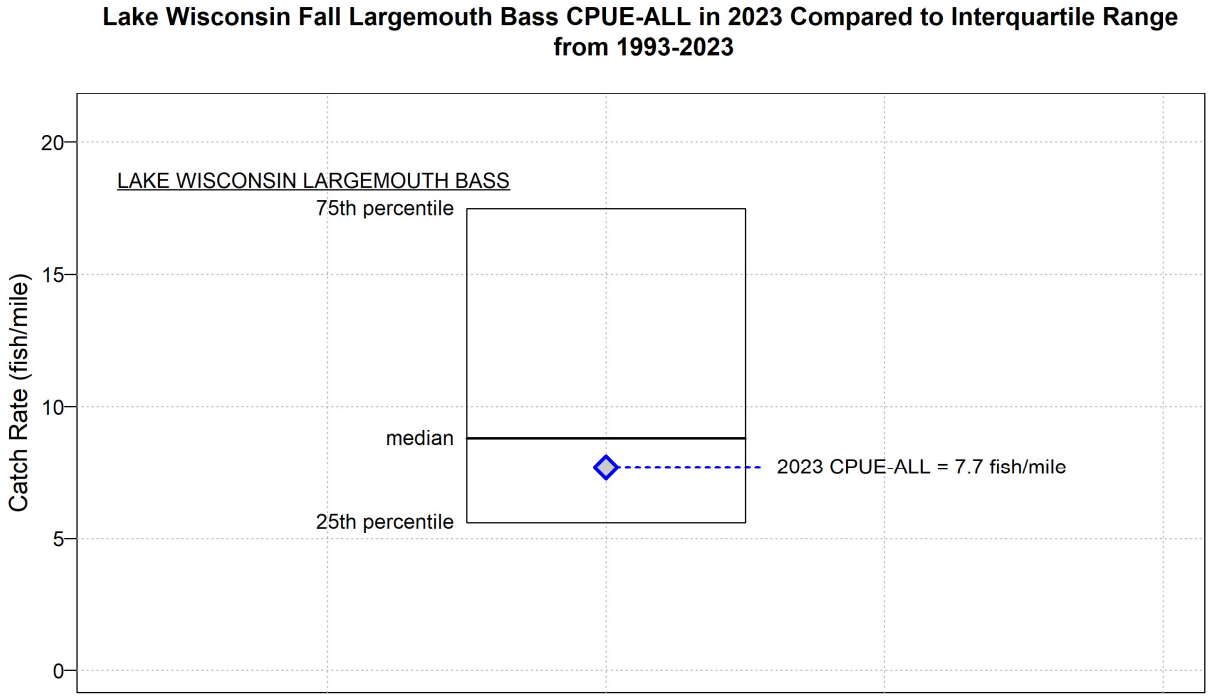


Figure 61. Catch rate of largemouth bass (CPUE-ALL) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-ALL for Lake Wisconsin, 1993-2023.

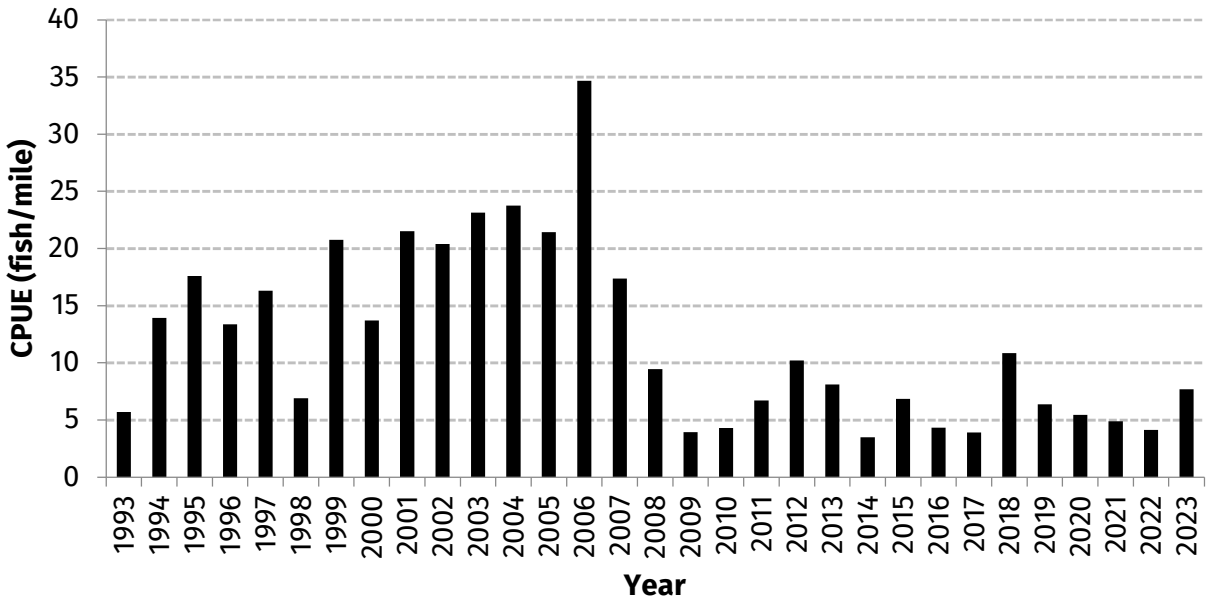


Figure 62. Catch rate of largemouth bass (CPUE-ALL) in fall electrofishing surveys of Lake Wisconsin, 1993-2023.

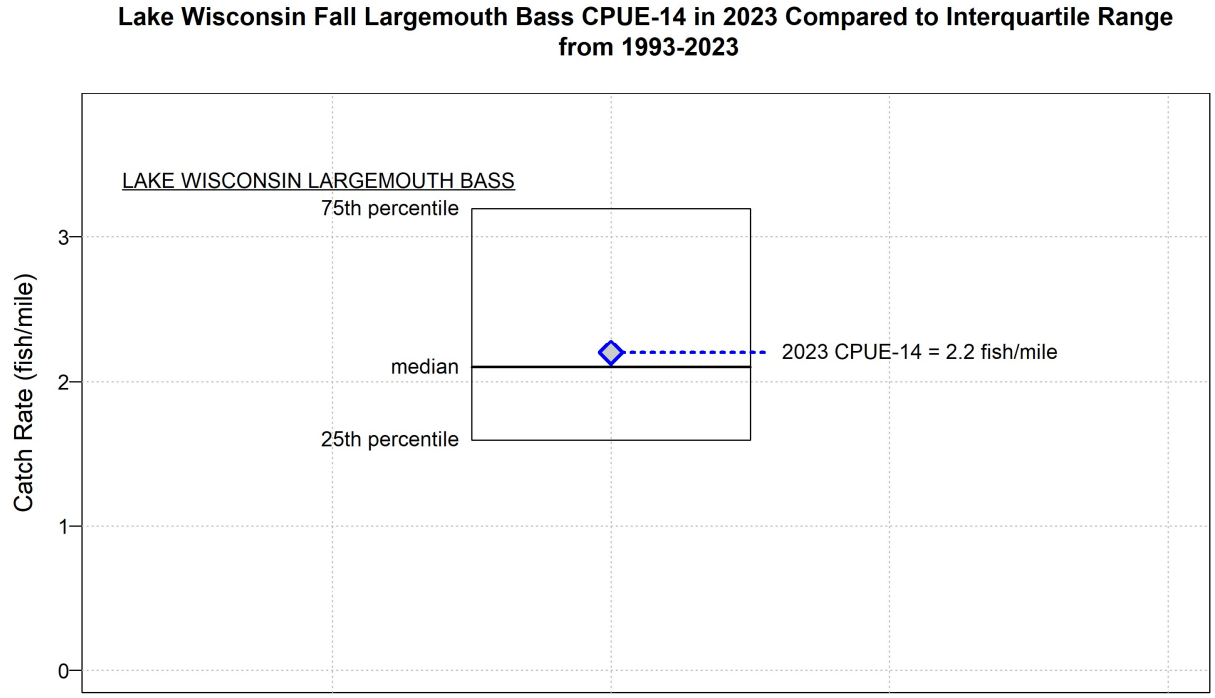


Figure 63. Catch rate of largemouth bass ≥ 14 inches (CPUE-14) in the fall 2023 electrofishing survey of Lake Wisconsin compared to the interquartile range of fall CPUE-14 for Lake Wisconsin, 1993-2023.

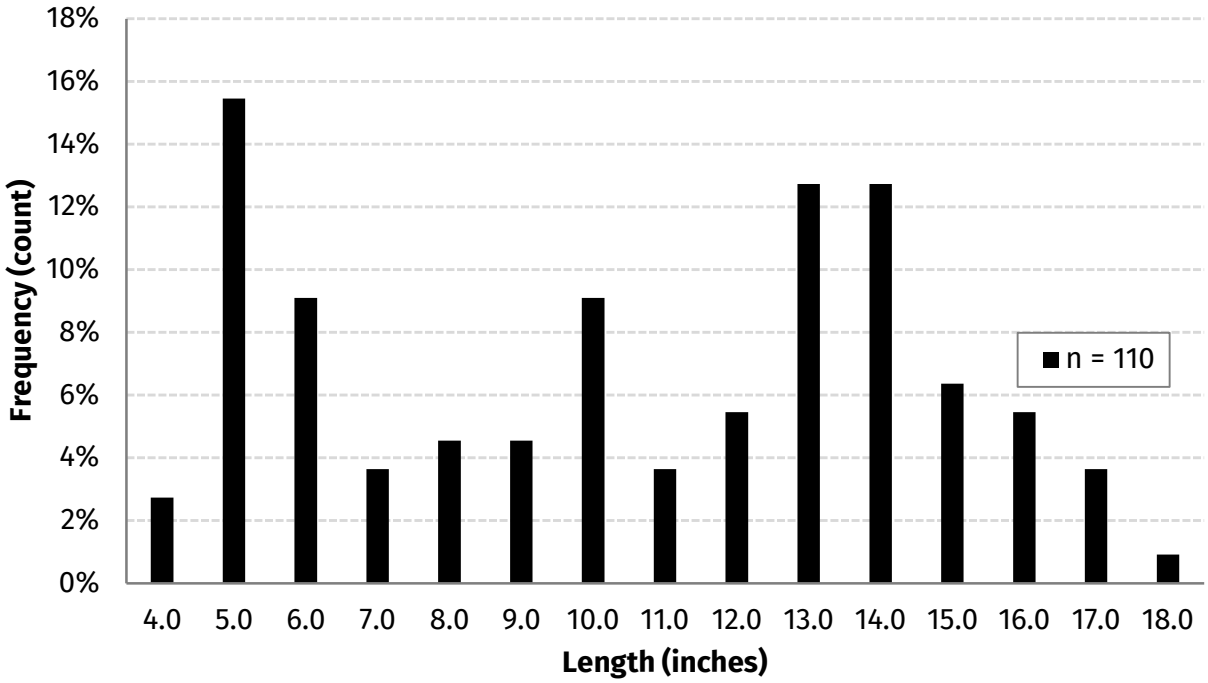


Figure 64. Length frequency distribution of largemouth bass sampled during the fall 2023 electrofishing survey of Lake Wisconsin.