WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Report for Bear Lake, Barron County, Wisconsin 2022

WATERBODY IDENTIFICATION CODE: 2105100

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Executive Summary

Bear Lake was surveyed during 2022 to determine the abundance and population demographics (size and age structure, growth and recruitment) of walleye as part of the Treaty assessment protocol for lakes within the Ceded Territory. In addition, the abundance and population demographics were assessed for other sport fish. The adult walleye population during 2022 was estimated to be 0.6 fish/acre (95% CI = 0.2 – 1.1 fish/acre), which remained similar to the 2008 and 2014 surveys. Walleye population demographics, including size structure and growth rates, also remained similar to recent surveys. The walleye management objective is to increase the adult density to ≥ 1.5 fish/acre by continuing to stock large fingerling (6-8 inches) walleye in alternate years, adjusting stocking rates (5 – 10 fish/acre) and changing stocking methods (alternate stocking locations and/or scatter planting). Alternate stocking practices will be monitored, and if walleye stockings continue to have low efficacy in Bear Lake, walleye stocking should be reconsidered altogether. The population density of northern pike remains high with poor size structure, growth rates and fish condition. The northern pike management objective is to decrease population abundance and increase size structure. Regulatory options that increase the harvest of small northern pike while protecting large individuals, such as a 25 – 35 inch protected slot limit, should be considered. Anglers are encouraged to harvest small northern pike. Bear Lake has a quality largemouth bass population with moderate density, good size structure, above average growth rates and excellent fish condition. The no minimum length limit and five fish daily bag limit regulation was implemented in 2011 and successfully reduced population abundance and increased size structure and growth rates. The current fishing regulation for largemouth bass will be maintained, and no additional management actions are recommended at this time. Bear Lake supports a quality bluegill population with moderate abundance and a good size structure. Population demographics remained similar to previous surveys, and no management actions are warranted at this time.

Introduction

The Wisconsin Department of Natural Resources (DNR) surveyed Bear Lake in 2022 to assess the status of the fishery. A mark-recapture survey was performed to estimate the adult density of walleye. We assessed the relative abundance of largemouth bass, northern pike, bluegill and black crappie. We characterized population demographics, size structure and growth for all species when possible.

LAKE CHARACTERISTICS

Bear Lake is a 1,348-acre drainage lake located in northern Barron County on the Barron and Washburn County line. The lake has a maximum depth of 87 feet and a mean depth of 20 feet. The lake is approximately three and a half miles long and has 14.9 miles of shoreline. The main basin has relatively steep sloping shorelines with moderate littoral area and two large shallow bays located in the northwest and southeast portions of the lake. There are 5.8 dwellings per shoreline mile. Bear Lake is classified as complex-two story lake (Rypel et al. 2019). There are four public boat launches and the lake receives moderate recreational boating use and angling pressure. More information on water quality and invasive species can be found on the DNR Lake page for Bear Lake.

STOCKING HISTORY

Walleye have been stocked into Bear Lake at various rates and sizes over the past two decades (Appendix Table 1). Beginning in 2006, stocking efforts have largely consisted of large fingerling (6-8 inch) walleye. Large fingerling walleye were stocked at a rate of 5 fish/acre from 2006 – 2012, 13 fish/acre from 2014 – 2018 and 20 fish/acre from 2020 – 2022.

FISHING REGULATIONS

Largemouth bass and walleye are managed with special fishing regulations. The fishing regulation for largemouth bass is a five fish daily bag limit with no minimum length limit (MLL). Similarly, the fishing regulation for walleye is a three fish daily bag limit with an 18-inch MLL. All other species follow statewide regulations.

Methods

FIELD SAMPLING

Bear Lake was sampled during 2022 with early spring fyke netting (SN1), early spring (SE1) and late spring (SE2) night electrofishing and fall night electrofishing (FE) surveys following the DNR comprehensive Treaty assessment protocol (Cichosz 2021).

The population abundance of adult walleye was estimated using mark-recapture methodology during the SN1 and SE1 surveys. The population size of adult walleye was estimated with Chapman's modification of the Peterson model (Ricker 1975):

$$N = \frac{(M+1)(C+1)}{(R+1)}$$

where N = population estimate; M = the number of fish marked in the first (marking) sample; C = the total number of fish (marked and unmarked) captured in the second (recapture) sample; and R is the number of marked fish captured in the second sample.

Walleyes were captured with fyke nets set at ice out. All walleyes were measured (total length), weighed, sexed and marked. Adult walleye ≥ 15 inches or sexable (extrusion of eggs or milt; Cichosz 2021) were marked with a fin clip, and juvenile walleye < 15 inches were marked with a different fin clip. Aging structures were collected from five walleye of each sex per 0.5-inch length group. Scales were taken from walleye < 12 inches, and dorsal spines were taken from fish ≥ 12 inches. For the recapture period, walleye collected during the SE1 survey were measured, sexed and checked for marks.

The SE2 survey was conducted to assess the largemouth bass and panfish populations. The SE2 survey consisted of 0.5-mile index stations where all gamefish and panfish were captured and 1.5-mile gamefish stations where only gamefish were collected. There were four index stations and four gamefish stations completed on Bear Lake. All fish were measured, but only largemouth bass were weighed. Aging structures were collected from five fish per 0.5-in length group for age and growth analysis. Catch per unit effort (CPUE; index of relative abundance) was estimated as catch per mile.

A fall electrofishing survey was conducted to assess the relative abundance of age-0 and age-1 walleye. Descriptions of standard DNR survey types, gear used, target water temperatures and target species are listed in Appendix Table 2.

Lake Class Standards CPUE was calculated by comparing CPUEs of each species to the CPUEs of all other complex-two story lakes in Wisconsin (Rypel et al. 2019).

Walleye and largemouth bass were aged with dorsal spines. Northern pike were aged with anal fin rays, and bluegill and black crappie were aged with scales. All spines and fin rays were cut with a Dremel tool and aged under a microscope. When data were available, the mean length at age was compared to previous surveys, county (Barron and Polk counties) averages and the median length at age for similar complex-two story lakes (Rypel 2019). Size structure was assessed using the proportional size distribution (PSD) indices (Neumann et al. 2013). The PSD value for a species is the number of fish of a specified length and longer divided by the number of fish of stock length or longer, the result multiplied by 100. Fish condition was assessed by estimating the relative weight (W_r) of each fish, or the actual weight of a fish divided by its standard weight (Wege and Anderson 1978). The von Bertalanffy (1938) growth model was determined using mean length at age data to assess growth. The total annual mortality of largemouth bass was estimated using catch curve analysis (Miranda and Bettoli 2007).

To assess walleye stocking survival, an age-length key was used to estimate the abundances of walleye in each year class, assuming no natural reproduction and all fish were from stocked origin. Survival was estimated by dividing the population estimate for each age class by the total number of fish stocked for that year and multiplying it by 100. The cost of each stocking event was calculated by multiplying the number of large fingerlings stocked by the average cost per large fingerling ($1.06). Cost per recruit to age 4, age 6, age 8 and age 10 were estimated by dividing the cost of each stocking event by the estimated abundance of that year class. The survival rate of stocked large fingerlings to age 1 was estimated by dividing the density of age-1 walleye (fish/acre; Shaw and Sass 2020) by the density (fish/acre) of stocked large fingerlings the previous fall. The cost per recruit to age 1 was estimated by dividing the cost of each stocking event by the estimated abundance of that year class.

Results and Discussion

WALLEYE

The adult walleye population density estimate in Bear Lake during 2022 was 0.6 fish/acre (95% CI = 0.2 – 1.1 fish/acre). The adult walleye density was similar to the 2008 and 2014 surveys and remained lower than the 1996 and 2000 surveys (Figure 1).

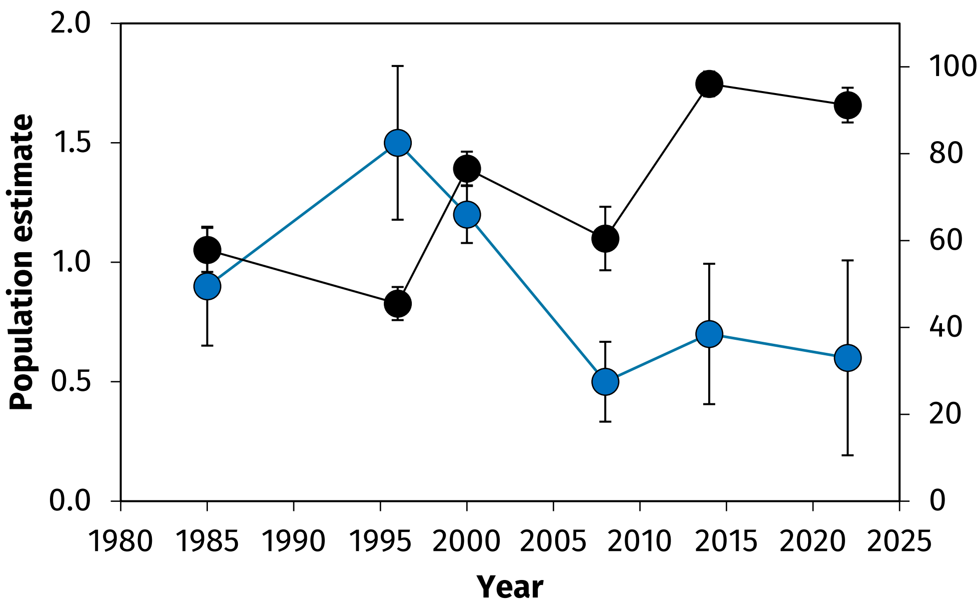

Figure 1. Walleye population estimates (number of fish per acre ± 95% CI; blue circles) and PSD-15 (± 95% CI; black circles) during the 1985, 1996, 2000, 2008, 2014 and 2022 Bear Lake fishery surveys.

There were 208 walleyes collected during the SN1 and SE1 surveys (Figure 2). Walleye CPUE during the SN1 survey was 2.97 fish/net night and resembled the 25th percentile

(2.97 fish/net night) for complex-two story Wisconsin lakes. Walleyes ranged in length from 10.2 – 27.7 inches and had an average length of 19.0 inches (Figure 2). The mean lengths of females and males was 21.9 inches and 16.6 inches, respectively. The sex ratio was nearly even with a male-to-female ratio of 1:1.

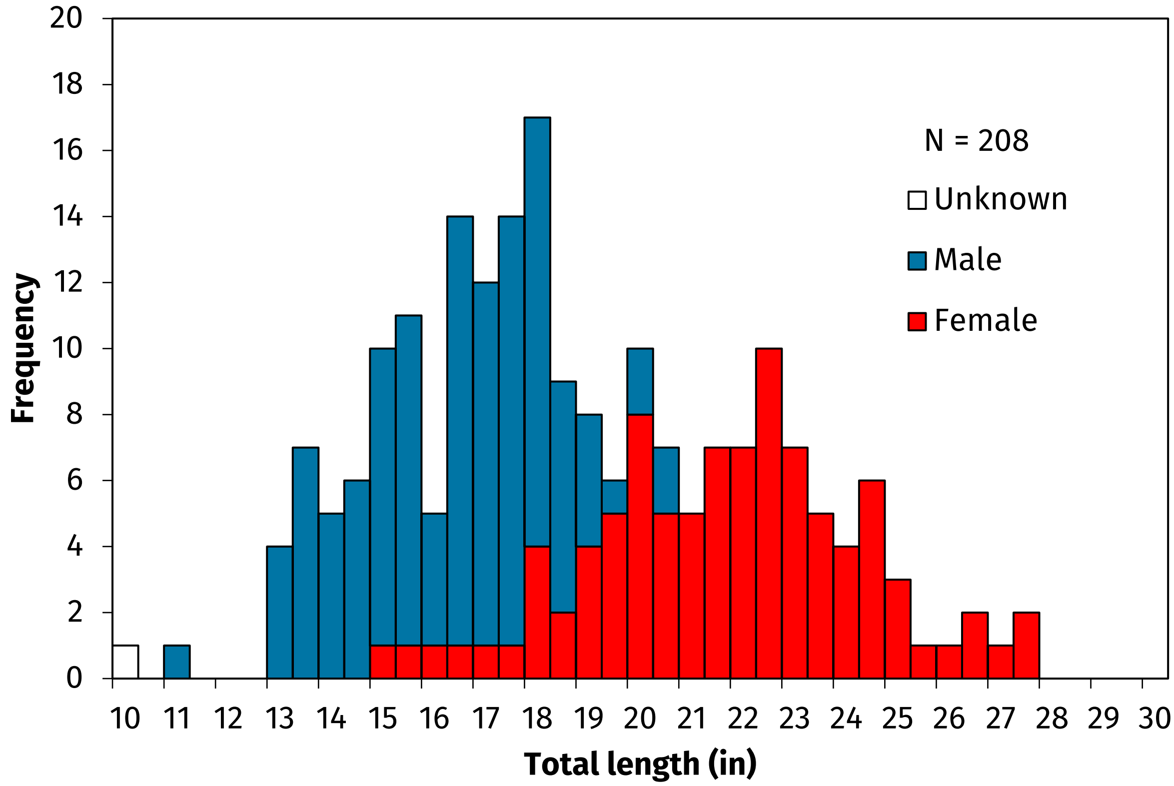

Figure 2. Length frequency histogram of walleyes collected during the SN1 and SE1 surveys in Bear Lake, Barron County, WI, 2022.

Walleye PSD-15 from netting was 91, and PSD-20 was 37. The PSD indices were high and suggested an above-average size structure (PSD-15 = 30 - 60; Anderson and Weithman 1978). Size structure indices were similar to 2014 (PSD-15 = 96) and remained higher than surveys prior to 2010 when walleye densities were greater (Figure 1). A similar percentage of the population was susceptible to harvest during 2022 (56%) and 2014 (60%), with most fish susceptible to harvest being females during both surveys (75% in 2022 and 80% in 2014).

Walleye growth rates were average. Walleye ages ranged from 4 to 14, while females ranged from 4 to 14 and males 4 to 10. Mean lengths at age during 2022 were similar to the Barron and Polk counties average (average difference in mean length at age: +0.3 inches) and the 2014 survey (average difference in mean length at age: +0.3 in) estimates but were greater than the median for similar complex-two story lakes (average difference in mean length at age: +1.4 in). All comparisons used ages 4 - 10. The predicted theoretical maximum length for walleye from the von Bertalanffy growth model was 30.4 inches, with k and t_0 estimated to be 0.13 and -1.35, respectively (Figure 3).

Multiple age classes of walleye were present. Walleye age structure was composed primarily of ages 4 to 8 (87%), but age classes up to age 14 were present. Consistent representation of stocked year classes to the adult age structure was evident, and no adult walleye were from non-stocked years.

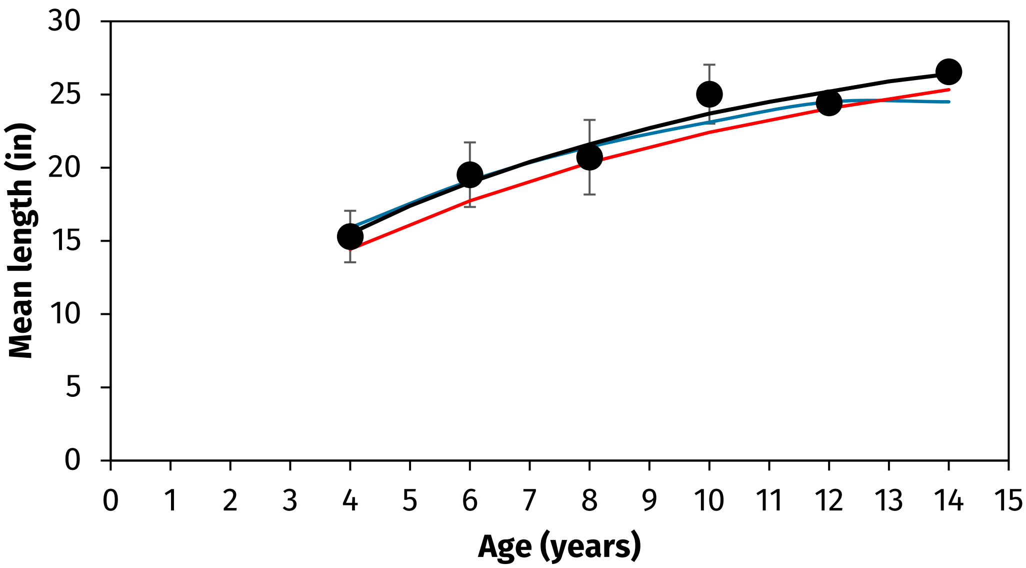

Figure 3. Mean length at age ± standard deviation of walleye (black circles; sexes pooled) in Bear Lake and the von Bertalanffy growth curve (black line). Mean length at age estimates for Barron and Polk counties are represented by the blue line, and the median length at age for similar complex-two story Wisconsin lakes by the red line. The 2014 survey estimates were similar to both the counties and lake class estimates and not represented in the plot.

No age-0 walleyes were collected during the 2022 FE survey, and one age-1 walleye was collected with a CPUE of 0.1 fish/mile (Figures 4 & 5). Walleye natural recruitment during 2022 was not apparent and remained low, similar to previous surveys over the past decade (Figure 4). Indexing natural recruitment from age-0 walleye CPUE was not possible in most surveys as age-0 catches were confounded by either same-year small fingerling stockings (2001, 2003, 2004 and 2006) or large fingerling stocking events that occurred prior to FE surveys (2010). Walleye natural recruitment in Bear Lake remains limited and insufficient to maintain a population.

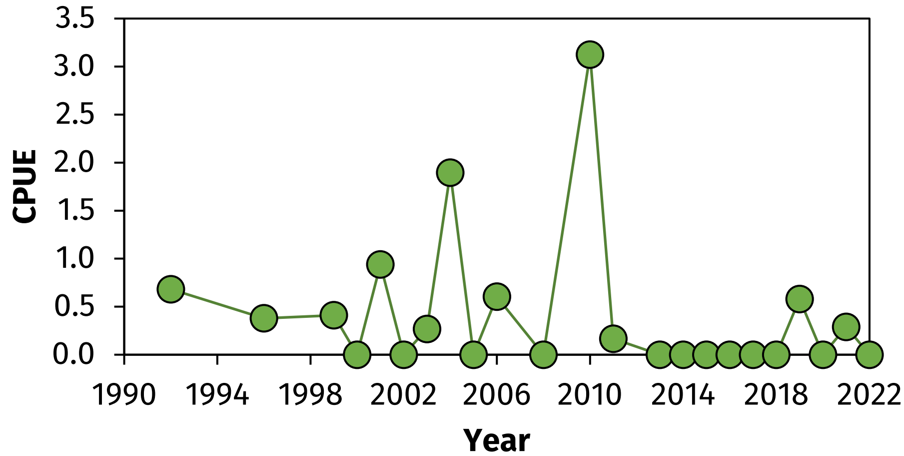

Figure 4. Age-0 walleye CPUE (fish/mile) indexed from fall electrofishing surveys during 1992 - 2022.

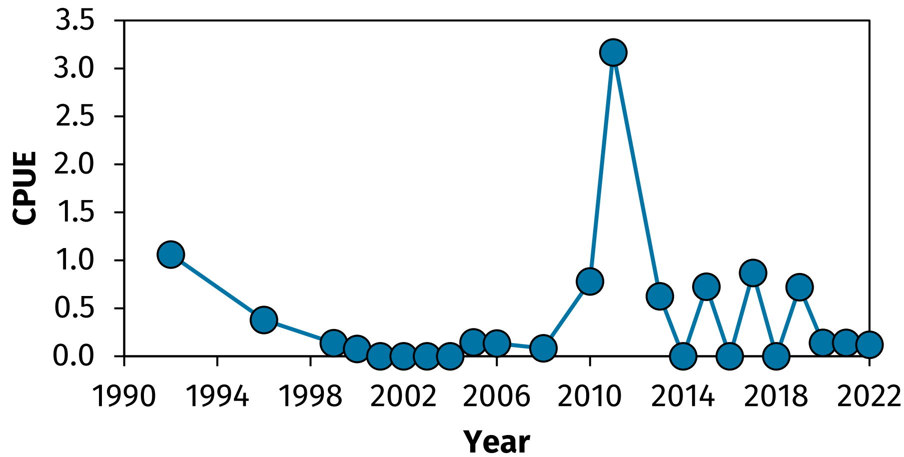

Figure 5. Age-1 walleye CPUE (fish/mile) indexed from fall electrofishing surveys during 1992 - 2022.

Survival of large fingerling walleye stocked during 2021 to age 1 was poor (6.5%) and well below mean survival rates observed for stocking-dependent systems in Barron and Polk counties (17.5% ± 2.5%; mean survival ± mean error; estimated using data from 64 FE surveys that corresponded with a large fingerling stocking the previous year, across 19 lakes). Greater survival rates of large fingerlings to age 1 were observed during 2010 and 2012 when walleye were stocked at a lower stocking rate (approx. five fish/acre) compared to later years when stocked at higher stocking rates (Figure 6). Correspondingly, the cost per age-1 walleye increased from $3.55 and $3.78 during 2010 and 2012 to approximately $9.00 during 2014 – 2018 and $16.36 during 2020. The density of age-1 walleye the year following stocking events remained consistent despite variable stocking rates (Figure 7).

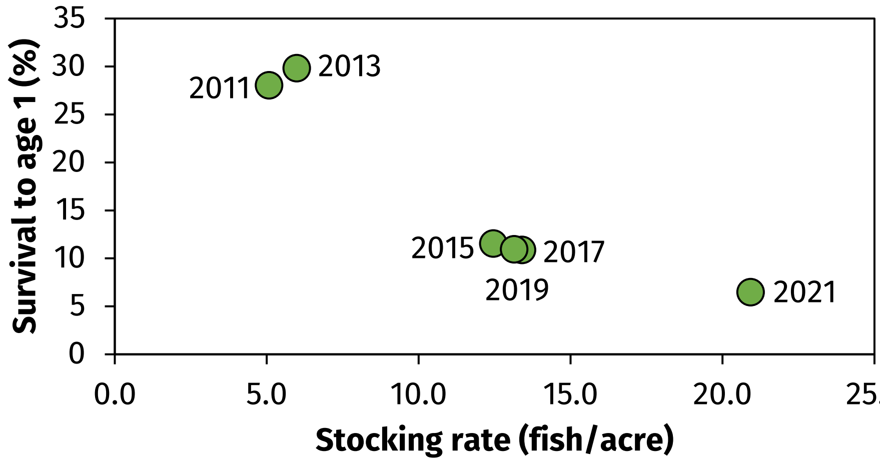

Figure 6. Survival of stocked large fingerling walleye to age 1 over a range of stocking rates (fish/acre). Age-1 walleye density was indexed during the 2011, 2013, 2015, 2017, 2019 and 2021 fall electrofishing surveys.

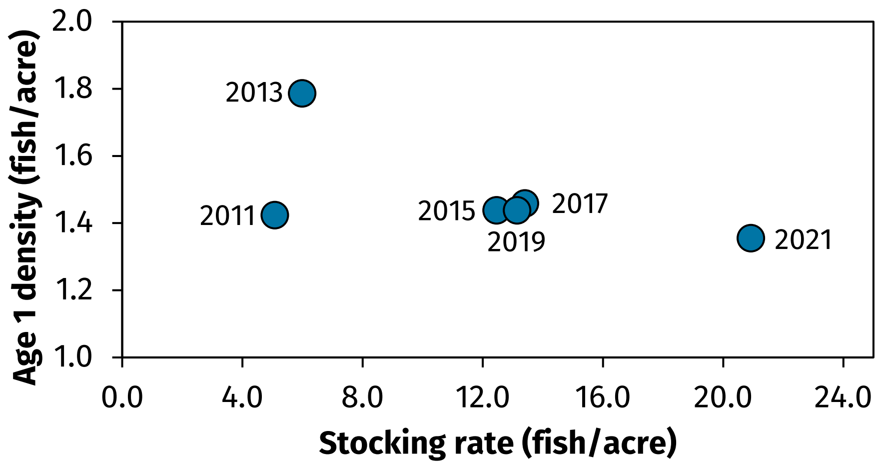

Figure 7. Density (fish/acre) of age-1 walleye over a range of stocking rates (fish/acre). Age-1 walleye density was indexed during the 2011, 2013, 2015, 2017, 2019 and 2021 fall electrofishing surveys.

Survival of stocked large fingerling walleye to ages 4, 6, 8 and 10 was 1.4%, 1.8%, 1.3% and 0.9%, respectively. The cost per age 4, 6, 8 and 10 fish was estimated at $77.87, $59.04, $81.29 and $123.01. Large fingerling survival to adult age classes was low compared to other stocking-dependent systems in Barron and Polk counties. Age-4 fish were fully mature and susceptible to survey methods but were not yet susceptible to harvest by the recreational fishery (18-inch MLL). Walleye were susceptible to recreational harvest at age 6, which may have lowered the survival estimates. Survival rates of large fingerling stockings were similar between ages 4 – 10. Although, the stocking rate was lower for age-10 fish (five fish/acre), which indicates survival rates of the 2012 stocked cohort at earlier adult ages would have likely been higher than that observed for current adult age cohorts stocked at 10 fish/acre. The survival rates and contributions to the adult population for the 2020 and 2022 cohorts stocked at 20 fish/acre are expected to be low.

Adult walleye density in Bear Lake was low but similar to the last two decades and well below management recommendations for stocked walleye populations (> 1.5 fish/acre; Donofrio et al. 2022). Adult walleye had an above-average size structure with average growth rates. Recruitment of stocked large fingerlings to the adult population was relatively poor, with unsatisfactory survival of all stocked year classes. Despite the low survival of large fingerlings, these stockings appear to be the sole source of recruitment since all adult walleye corresponded to large fingerling stocking events, indicating poor natural recruitment and survival of stocked small fingerlings.

The walleye management goal in Bear Lake is to increase the adult walleye density to ≥ 1.5 fish/acre to provide a quality angling opportunity and meet management recommendations set forth by Donofrio et al. (2022) for stocked populations. Future large fingerling walleye stocking should be reduced to 5 - 10 fish/acre during alternate years. Alternate stocking methods that may improve stocking survival should be considered, such as stocking at a different boat ramp or scatter planting. The current DNR stocking location is in poor juvenile walleye habitat. Scatter planting is an alternate stocking method where fish are stocked in multiple predetermined locations with suitable habitat. Whether scatter planting walleye has a benefit to survival is uncertain, and more data is needed to determine if it is a beneficial practice. If the large fingerling walleye stockings continue to have low efficacy in Bear Lake, discontinuing walleye stocking should be considered.

NORTHERN PIKE

There were 347 northern pike collected during the SN1 survey. The CPUE was 6.4 fish/net night, which was above the 95th percentile (5.5 fish/net night) for similar complex-two story Wisconsin lakes and declined since 2014 (9.2 fish/net night; Figure 8).

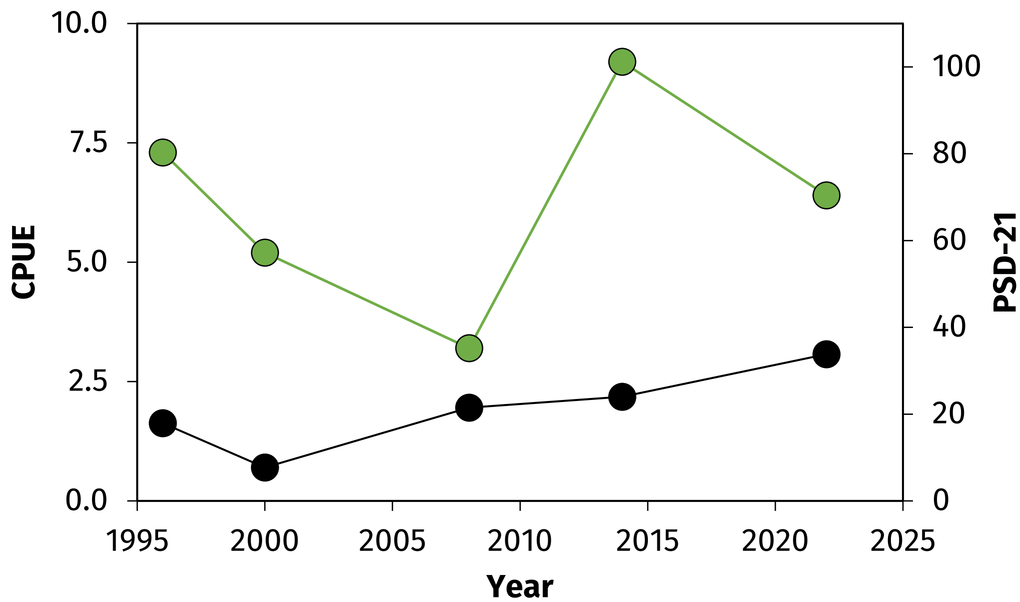

Figure 8. Northern pike CPUE (green circles) and PSD-21 (black circles) during the 1996, 2000, 2008, 2014, and 2022 Bear Lake fishery surveys.

Northern pike ranged in length from 11.4 to 31.1 inches and had an average length of 19.9 inches, which was near the 90th percentile (19.4 inches) for similar complex-two story Wisconsin lakes (Figure 9). The mean length of males was 18.1 inches, and the mean length of females was 21.3 inches. The size structure was low, likely due to their high abundance. The northern pike PSD-21 from netting was 34, and the PSD-28 was 2 (Figure 8). The PSD-21 was the highest it has been in Bear Lake, but PSD-28 remained similar to previous surveys. The W_r was 77, which suggested northern pike were in below-average condition and condition declined since 2014 (W_r = 88).

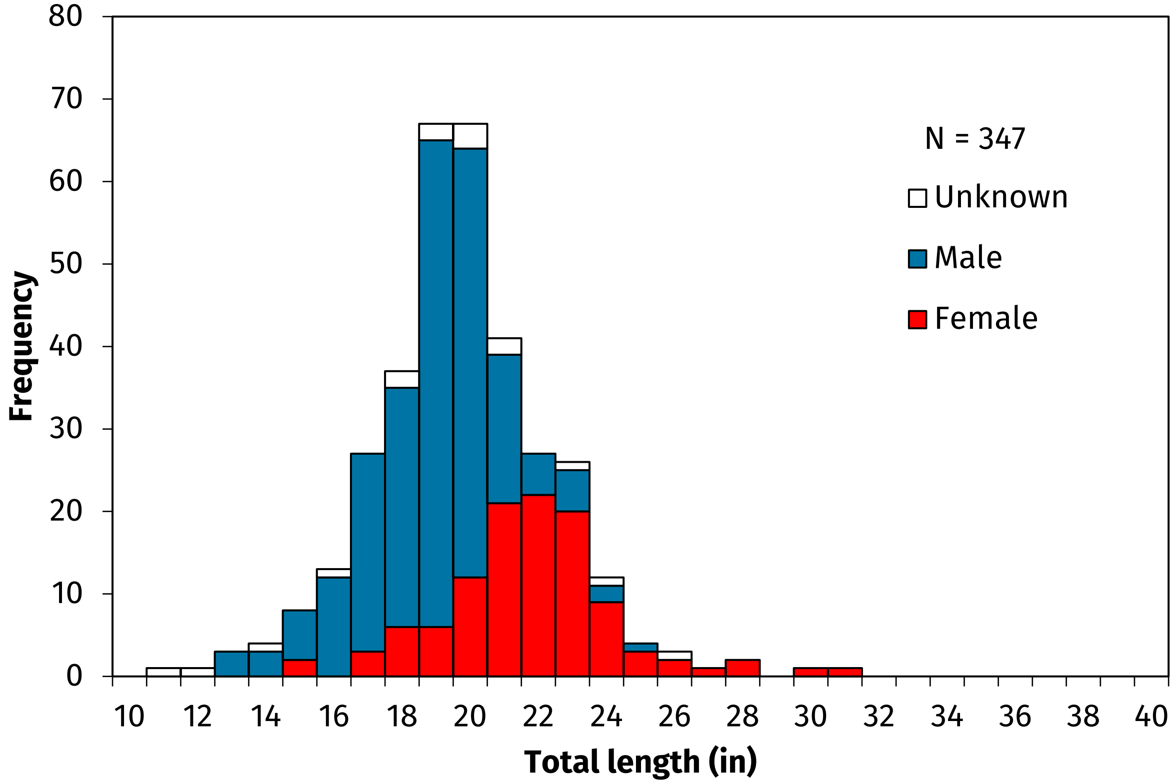

Figure 9. *Length frequency histogram of northern pike collected during the SN1 survey in Bear Lake, Barron County, WI, 2022.*

Northern pike growth rates were below average. Northern pike ages ranged from 3 to 10, while females ranged from 3 to 10 and males 3 to 6. Mean lengths at age during 2022 were lower than mean estimates from Barron and Polk counties (average difference in mean length at age: -4.1 inches), the 2014 survey (average difference in mean length at age: -1.7 inches) and the median for complex-two story lakes (average difference in mean length at age: -2.5 inches). All comparisons used ages 3 - 6. The predicted theoretical maximum length for northern pike from the von Bertalanffy growth model was 36.2 inches, with k and t_0 estimated to be 0.19 and 0.58, respectively (Figure 10).

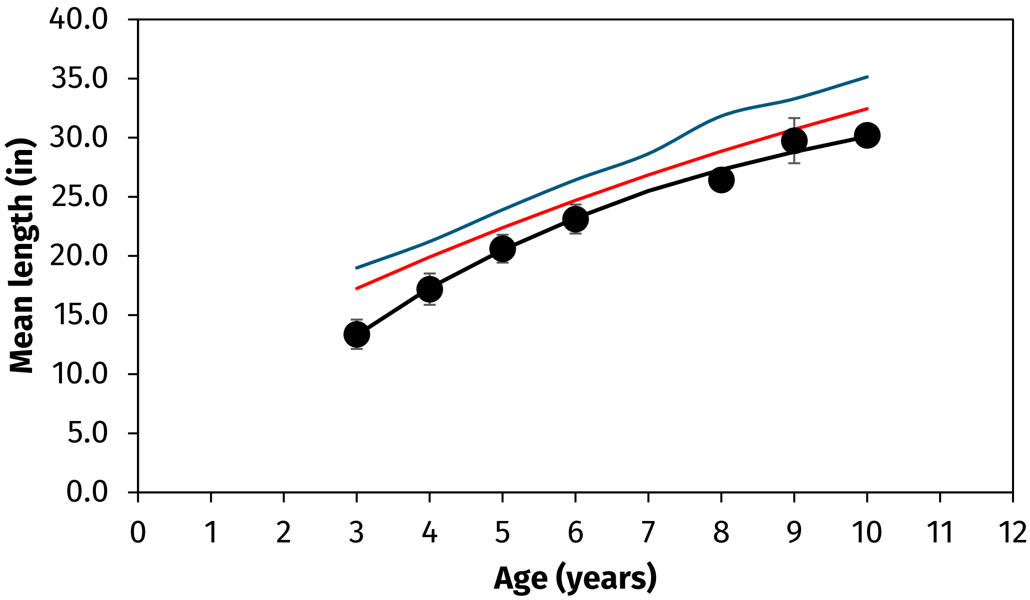

Figure 10. Mean length at age ± standard deviation of northern pike (black circles; sexes pooled) in Bear Lake and the von Bertalanffy growth curve (black line). Mean length at age estimates for Barron and Polk counties are represented by the blue line and the median length at age for similar complex-two story Wisconsin lakes by the red line.

Bear Lake has a high density, low size structure northern pike population. Catch rates have declined since 2014, which corresponded with an increase in population size structure, which was the highest observed in Bear Lake. Despite this, growth rates and fish conditions are both poor and declined since 2014, which suggests population density remains too high. Cisco are present in Bear Lake, which could provide excellent forage and potentially increase growth potential. But, the majority of the current northern pike population is likely too small and gape limited to utilize cisco as forage. Regulatory options that increase the harvest of small northern pike while protecting large individuals has the potential to improve population size structure. For instance, a protected slot limit (PSL) of 25 – 35 inches with a five fish daily bag limit is one regulatory option that could potentially increase harvest of small northern pike. The 2014 creel survey indicated anglers are willing to harvest small northern pike, with the average length of fish harvested being 21.8 inches during the open water season and 23.7 inches during the ice fishing season. A 25 – 35-inch PSL regulation would decrease the percentage of the population susceptible to harvest by only 3% compared to the no MLL regulation but protect the upper end of the size structure. This PSL regulation option would continue to allow for high harvest opportunities but also promote greater size structure in Bear Lake. Anglers are encouraged to increase harvest of small northern pike which should continue to improve size structure with time.

LARGEMOUTH BASS

There were 80 largemouth bass collected during the SE2 survey with a CPUE of 10.0 fish/mile, which declined since the 2014 survey (16.5 fish/mile) and the 2008 survey (18.6 fish/mile). The CPUE was below the 75th percentile (12.3 fish/mile) for similar complex-two story Wisconsin lakes and indicative of a moderate-density population. The CPUE of largemouth bass ≥ 14 inches was 5.5 fish/mile and increased since the 2014 survey (3.9 fish/mile).

Largemouth bass ranged in length from 6.5 - 19.2 inches, and the mean length was 13.6 inches. The largemouth bass mean length was above the 95th percentile (12.1 inches) for similar complex-two story Wisconsin lakes (Figure 11) and has increased since 2014 (11.5 inches). The PSD-12 was 74, and PSD-14 was 57, which indicated good size structure, and both indices improved since the 2014 fishery survey (PSD-12 = 49 and PSD-14 = 26).

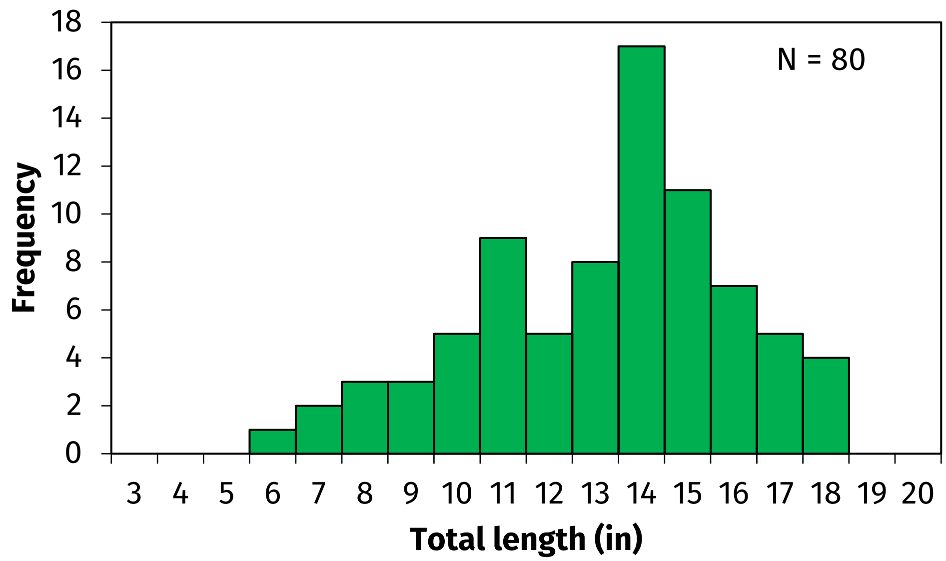

Figure 11. Length frequency of largemouth bass captured in Bear Lake during the 2022 SE2 survey.

Largemouth bass had above average growth rates. The mean length at age was greater than 2014 (average difference in mean length at age estimates: +1.5 inches), Barron and Polk counties mean estimates (average difference in mean length at age estimates: +2.4 inches), and the median length at age standard for similar complex-two story Wisconsin lakes (average difference in length at age estimates: +2.1 inches; Figure 12). All comparisons used ages 2 – 7. The predicted theoretical maximum length for largemouth bass from the von Bertalanffy growth model was 20.7 inches, with k and t_0 estimated to be 0.24 and -0.47, respectively. The mean W_r of largemouth bass was 108 and indicated fish were in above-average condition (Bennett 1970). The mean W_r remained similar to the 2014 survey (mean W_r = 106).

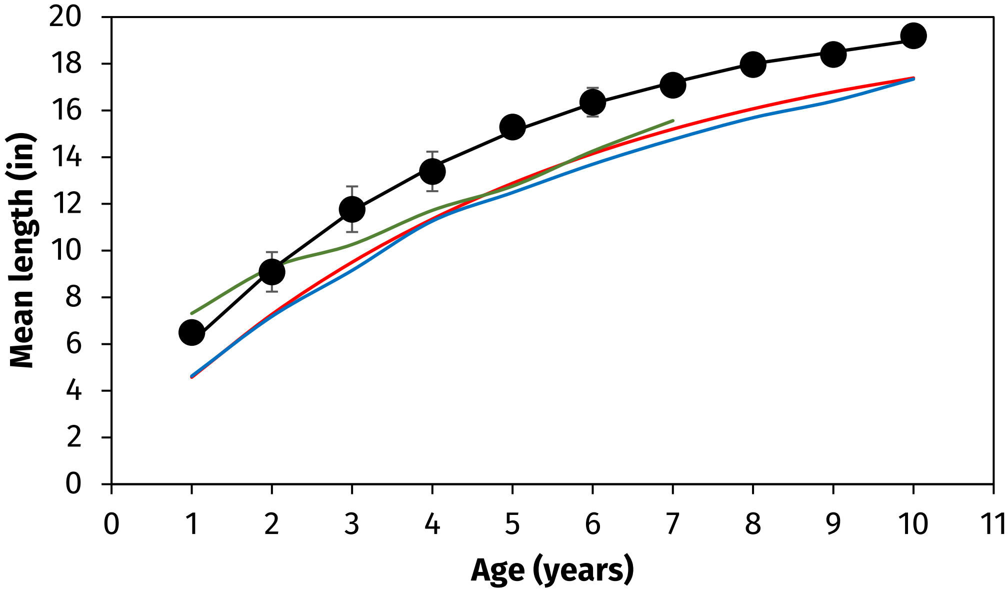

Figure 12. Mean length at age ± standard deviation for largemouth bass during the 2022 SE2 survey on Bear Lake and the von Bertalanffy growth curve (black line). The red line represents the median length at age estimates for complex-two story Wisconsin lakes, the green line represents the 2014 survey mean length at age estimates, and the blue line represents mean estimates from Barron and Polk counties.

Total annual mortality estimated from a catch curve regression model was 36.6% (ages 3 – 10; R^2 = 0.95; Figure 13).

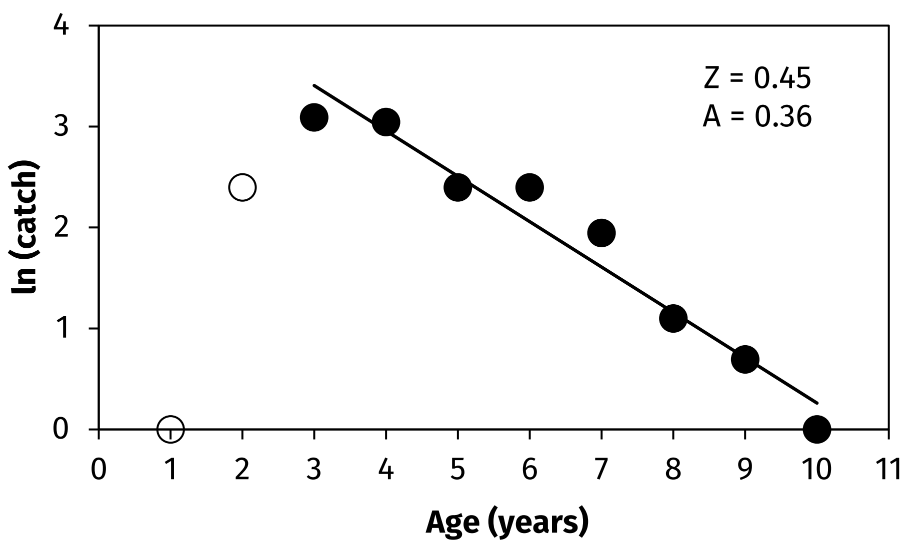

Figure 13. Catch curve analysis plot representing the natural logarithm of the catch for each largemouth bass age class used in the analysis (black circles) and not (white circles). Z = instantaneous total mortality, A = annual total mortality rate.

Bear Lake has a quality largemouth bass population with moderate density, good size structure, above-average growth rates and excellent fish condition. The fishing regulation for largemouth bass changed from a 14-inch MLL and five fish daily bag limit to a no MLL and five fish daily bag limit during 2011. Population abundance has decreased since the 2008 and 2014 surveys, while size structure and growth rates have increased. Largemouth bass will continue to be managed with a no MLL and five fish daily bag limit, and no additional management actions are recommended at this time.

BLUEGILL

A total of 212 bluegills were collected during the SE2 survey. Bluegill CPUE was 109 fish/mile, which was below the 75th percentile (119 fish/mile) for similar complex-two story Wisconsin lakes and indicative of moderate population abundance. Bluegill CPUE remained similar to 2014 (138.5 fish/mile) and was well above the mean bluegill CPUE for lakes in Barron and Polk counties (54.0 ± 4.7 fish/mile; ± SE). The CPUE of quality size (≥ 6 inches) and preferred size (≥ 8 inches) fish was 65 fish/mile and four fish/mile, respectively (Gabelhouse 1984). The CPUE of quality-size fish remained similar to 2014 (59 fish/mile) and was well above the mean quality-size fish CPUE for lakes in Barron and Polk counties (23.7 ± 2.1 fish/mile; ± SE).

Bluegill lengths ranged from 2.1 – 8.3 inches and had an average length of 5.5 inches (Figure 14). The mean length of bluegills was near the 99th percentile (5.8 inches) for similar complex-two story Wisconsin lakes. The PSD-6 was 62, and the PSD-8 was 4. The PSD-6 index value was above the generally accepted range for a balanced bluegill population (PSD-6 = 20-60) by Anderson (1985) and well above the mean PSD-6 index value for lakes in Barron and Polk counties (PSD-6 = 47 ± 3; SE). The PSD-6 and PSD-8 index values have increased since 2014 (PSD-6 = 44 and PSD-8 = 2) and were well above the mean PSD-6 index value for lakes in Barron and Polk counties (PSD-6 = 47 ± 3; SE).

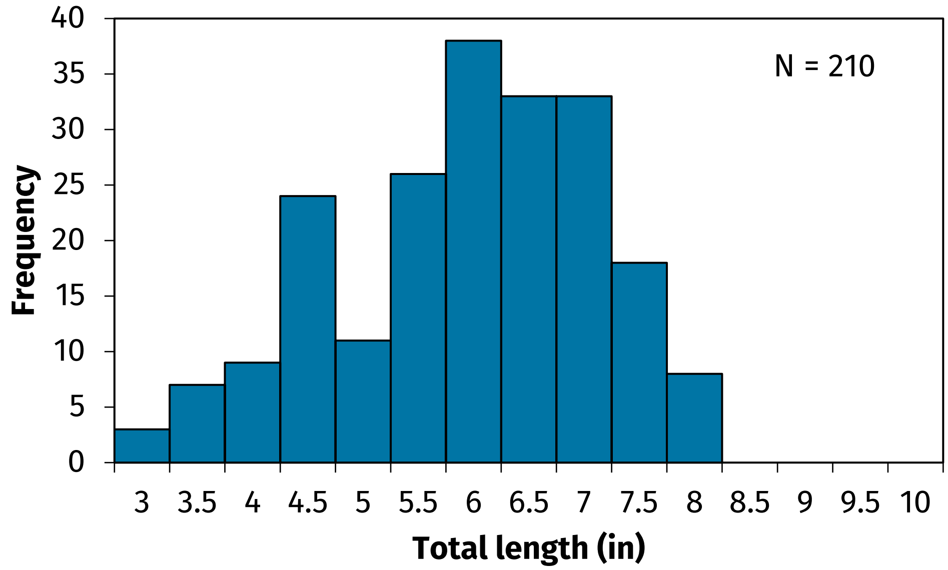

Figure 14. Length frequency of bluegill captured from Bear Lake during the 2022 SE2 survey.

Bluegills in Bear Lake had average growth rates that improved since 2014. Mean length at age was similar to the median length at age estimates for similar complex-two story Wisconsin lakes (average difference in length at age estimates: +0.2 inches) and the Barron and Polk counties mean estimates (average difference in mean length at age estimates: +0.1 inches) but were greater than the 2014 survey mean estimates (average difference in mean length at age estimates: +0.9 inches; Figure 15). All comparisons used ages 2 – 7. The von Bertalanffy growth model could not be fit to the observed age-length data.

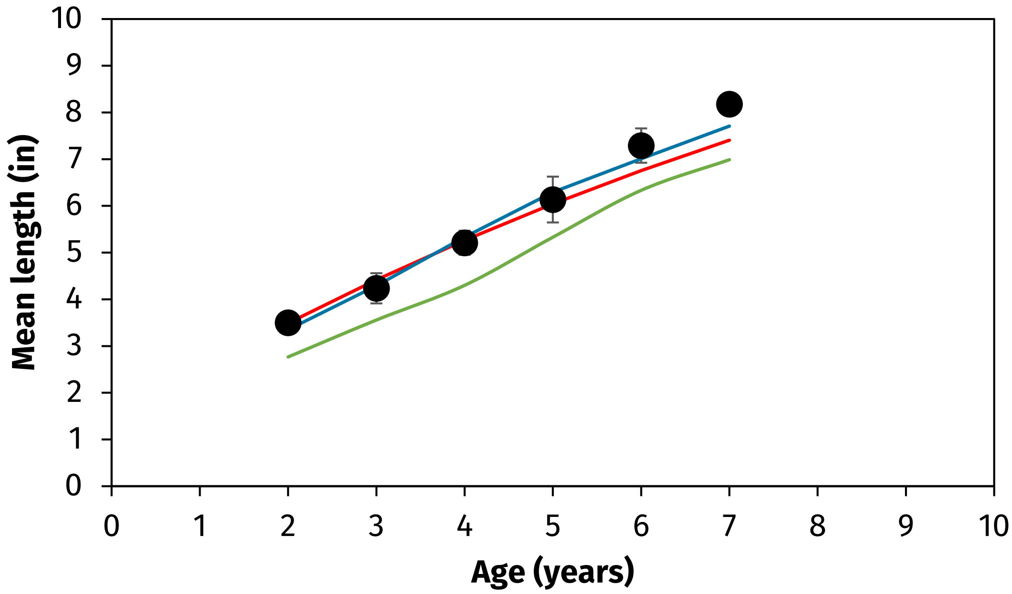

Figure 15. Mean length at age ± standard deviation for bluegills during the 2022 SE2 survey on Bear Lake. The red line represents the median length at age estimates for complex-two story Wisconsin lakes, the green line represents the 2014 survey mean length at age estimates, and the blue line represents the mean estimates from Barron and Polk counties.

Bear Lake supports a quality bluegill fishery with moderate abundance and a good size structure. Growth rates have improved since 2014 but remain average compared to lake class and counties standards. The bluegill population should continue to support a quality fishery, and no management actions are recommended at this time.

OTHER PANFISH

A total of five black crappies, eight rock bass, twenty-four pumpkinseeds and eleven yellow perch were collected during the 2022 SE2 survey.

Management Recommendations

1. Increase walleye density to ≥ 1.5 fish/acre by continuing to stock large fingerling (6-8 inches) walleyes in alternate years. Walleye stocking efforts should continue to focus solely on large fingerling stockings. The stocking rate should be reduced to 5 - 10 fish/acre, and alternate stocking approaches should be developed, implemented and assessed. The relative contribution of large fingerlings to the adult population should be reassessed during the next comprehensive survey in 2028. Fall electrofishing surveys will be conducted every other year during non-stocked years to assess the survival of stocked large fingerlings to age 1. If the large fingerling walleye stockings continue to have low efficacy in Bear Lake, walleye stocking should be reconsidered.

2. Regulatory options that increase the harvest of small northern pike while protecting large individuals, such as a 25 – 35-inch PSL, should be considered. An assessment of public support for a regulation that improves size structure yet offers a quality harvest opportunity should be conducted.
3. Largemouth bass will continue to be managed with a no MLL and five fish daily bag limit. Otoliths should be collected during the next survey to improve estimates of age, growth and mortality.
4. No specific management actions regarding bluegill, black crappie and yellow perch are recommended at this time. Black crappie abundance and size structure should be indexed during the next SN1 survey as catches were low during the SE2 survey. Otoliths should be collected from bluegills and black crappies during the next survey to improve age and growth estimation.
5. The next comprehensive fisheries survey is scheduled for 2028 but is subject to change depending on local and statewide sampling plans. The abundance, size structure, age structure and growth of walleye, northern pike, largemouth bass and panfish should be closely monitored.
6. Public input regarding the fishery and angler preference information should be assessed during the next comprehensive fisheries survey. Engaging resource constituents via public meetings or questionnaires will provide indications of public preferences and will help guide future management directions, goals and objectives.
7. Efforts to increase habitat complexity in Bear Lake should also be encouraged where applicable. Inputs of coarse woody habitat, protection/promotion of aquatic vegetation and maintenance/restoration of vegetative buffers would be beneficial. This website healthylakeswi.com is a great resource to learn about this recommendation.
8. Invasive species monitoring and control programs should continue.

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APPENDICES

Appendix Table 1. Fish stocking records for Bear Lake, 2000 – 2022.

YEAR	SPECIES	AGE CLASS	NUMBER STOCKED	SOURCE
2022	Walleye	Large Fingerling	26,955	DNR
2020	Walleye	Large Fingerling	28,411	DNR
2018	Walleye	Large Fingerling	17,845	DNR
2016	Walleye	Large Fingerling	18,196	DNR
2014	Walleye	Large Fingerling	16,919	DNR
2013	Walleye	Small Fingerling	26,366	Tribal
2013	Walleye	Small Fingerling	26,366	Private
2012	Walleye	Large Fingerling	6,893	DNR
2012	Walleye	Small Fingerling	23,691	Private
2010	Walleye	Large Fingerling	8,134	DNR
2009	Walleye	Large Fingerling	3,268	Private
2008	Walleye	Small Fingerling	23,764	DNR
2006	Walleye	Large Fingerling	8,505	DNR
2004	Walleye	Fry	525,000	DNR
2004	Walleye	Small Fingerling	102,326	DNR
2004	Walleye	Small Fingerling	27,193	Tribal
2003	Walleye	Small Fingerling	55,908	Tribal
2003	Walleye	Small Fingerling	101,825	DNR
2001	Walleye	Small Fingerling	101,850	DNR
2001	Walleye	Small Fingerling	52,348	Tribal
2000	Walleye	Large Fingerling	14,850	Tribal

Appendix Table 2. Survey types, gear used, target water temperature and target species.

SURVEY TYPE	GEAR USED	TARGET WATER TEMPERATURE (°F)	TARGET SPECIES
Spring Netting 1 (SN1)	Fyke Net	~45	Walleye, northern pike
Spring Electrofishing 1 (SE1)	Boat Electrofishing	45-50	Walleye
Spring Netting 2 (SN2)	Fyke Net	50-55	Muskellunge, black crappie, yellow perch
Spring Electrofishing 2 (SE2)	Boat Electrofishing	55-70	Largemouth bass, smallmouth Bass, bluegill and other panfish, non-game species
Spring Netting 3 (SN3)	Fyke Net	65-80	Bluegill, black crappie
Fall Electrofishing (FE)	Boat Electrofishing	50-60	Juvenile walleye and muskellunge