WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Report For Big Butternut Lake, Polk County, Wisconsin 2022

Waterbody Identification Code: 2641000

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Introduction

Big Butternut Lake is a 384-acre drainage lake located in northern Polk County, Wisconsin. The lake has a maximum depth of 19 feet and a mean depth of 13 feet. Big Butternut Lake has gradual sloping shorelines and bottom substrates roughly composed of 65% sand, 5% gravel and 30% muck. Shorelines are primarily developed with 25.9 dwellings per shoreline mile.

The Wisconsin Department of Natural Resources (DNR) surveyed Big Butternut Lake to assess the status of the fishery during 2022 with early spring fyke netting (SN1), early spring (SE1) and late spring (SE2) night electrofishing and fall night electrofishing. A mark-recapture survey was completed to estimate the adult density of walleyes. We assessed catch rates of largemouth bass, northern pike, bluegill and other panfish species to estimate relative abundance. We characterized population demographics, size structure and growth for all species when possible. Recent management efforts have focused on walleye stocking, limiting harvest of adult walleyes and liberalizing harvest of largemouth bass through regulation changes.

LAKE CHARACTERISTICS

Big Butternut Lake is a fertile, eutrophic system classified as a complex-warm-dark lake (Rypel et al. 2019). The July-August mean Trophic State Index (TSI) values for chlorophyll-a, Secchi depth and total phosphorus were 71, 66 and 65, respectively. Mean TSI has generally remained stable over the past decade. There is one public boat launch located near the southwest corner of the lake off S Shore Dr. (45.567, -92.469). More information on water quality and invasive species can be found at the DNR lake page for Big Butternut Lake.

STOCKING HISTORY

Walleyes were first stocked into Big Butternut Lake during 1934 and were consistently stocked through 1980, including fry and small fingerlings. A good adult walleye population was present until at least the 1980s. Natural recruitment was evident prior to the 1990s, but it appeared the population was primarily stocking dependent (Cornelius 1992). Stocking post-1980 relied solely on small fingerlings and continued through 2003. Small fingerling walleye stocking appeared to be successful prior to 1990 but generally failed afterwards. The declining success of small fingerling stockings was thought to be driven by an increasing largemouth bass population, which had relative abundances increase 1,850% from 1985 – 2003 (Benike 2005). The small fingerling stocking strategy was not meeting management goals and objectives, which prompted a shift to large fingerling stocking in 2005. Coincidingly, the 14-inch minimum length limit (MLL) for largemouth bass was replaced with a no MLL to increase harvest mortality and reduce population densities (Benike 2005). The 18-inch MLL regulation for walleyes was implemented during 2011 to reduce harvest mortality of adults. Large fingerling walleyes have been stocked every other year since 2005 at approximately 10 fish/acre (Appendix Table 1). Additionally, the St. Croix Tribal Natural Resources Department stocked small fingerling walleyes during 2016, 2017 and 2019 and large fingerling walleyes during 2017.

FISHING REGULATIONS

Walleye are managed with a 3 fish daily bag limit and an 18-inch minimum length limit (MLL). Largemouth bass are managed with a no MLL and 5 fish daily bag limit. All other species follow statewide or Ceded Territory regulations.

Methods

Big Butternut Lake was sampled during 2022 following the DNR's comprehensive treaty assessment protocol (Cichosz 2021) to estimate the adult walleye population abundance. Descriptions of standard DNR survey types, gear used, target water temperatures and target species are listed in Appendix Table 2. The SN1 survey occurred April 23 – 26, 2022 and all walleyes and northern pike were measured (total length), weighed, sexed and given a mark indicating capture. Catch per unit of effort (CPUE) was estimated as catch per net night, and length-weight data were used to estimate size structure indices, growth and condition. Adult walleyes ≥ 15 inches and all sexable walleyes were marked with a fin clip and juvenile walleyes < 15 inches were marked with a different fin clip. A single recapture event occurred the night of April 26, 2022 via boat electrofishing.

The SE2 survey was conducted on May 23, 2022 to assess 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 stations where all gamefish were collected. There were two index stations and two gamefish stations completed on Big Butternut Lake. All fish were measured, but weights and aging structures were collected from five fish per 0.5-inch length group for age and growth analysis. The CPUE (index of relative abundance) was estimated as catch per mile.

A fall night electrofishing survey was conducted on September 20, 2022 to assess the year-class strength of age-0 and age-1 walleyes. The entire shoreline was sampled, and walleyes < 12 inches were collected. The CPUE (catch per mile) of age-0 and age-1 walleyes was compared to previous fall evaluations.

Lake class standards CPUE were calculated by comparing Big Butternut Lake catch rates to the CPUEs of the other 196 complex-warm-dark lakes in Wisconsin (Rypel et al. 2019). When data were available, CPUE and size structure indices were also compared to past surveys.

Walleyes and largemouth bass were aged with dorsal spines, black crappies with scales, bluegills with otoliths and northern pike with anal fin rays. All spines and fin rays were cut with a Dremel tool and aged under a microscope by a single interpreter. Otoliths were transverse thin-sectioned and aged under a microscope. When data were available, mean length at age was compared to previous surveys, county (Barron and Polk) averages, Northern Region averages (18 counties in the DNR Northern Region) and the median length at age for similar complex-cool-dark lakes (Rypel 2019).

Size structure was assessed using 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 with 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 growth model (von Bertalanffy 1938) was fit using mean length at age data, pooling sexes due to limited age data, to assess growth of largemouth bass, walleye and bluegill.

To assess walleye stocking survival, an age-length key was used to estimate abundances 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. 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 3, age 5 and age 7 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 walleyes (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 & Discussion

WALLEYE

There were 516 walleyes sampled during the population estimate survey. The population estimate of adult walleyes in 2022 was 2,264 fish (95% confidence interval; CI = 1,179 – 3,350 fish) or 6.0 fish/acre (CV = 0.25; Figure 1). Adult walleye density was greater than other stocking dependent lakes in Barron and Polk counties (1.4 ± 0.2 fish/acre; mean PE ± mean error; estimated using data from 55 PE surveys, across 26 lakes ranging from 1995 to 2021) and increased since the early 2000s (Figure 1). The CPUE was 28.7 fish/net night, which was slightly below the 99th percentile (30.4 fish/net night) for complex-warm-dark Wisconsin lakes.

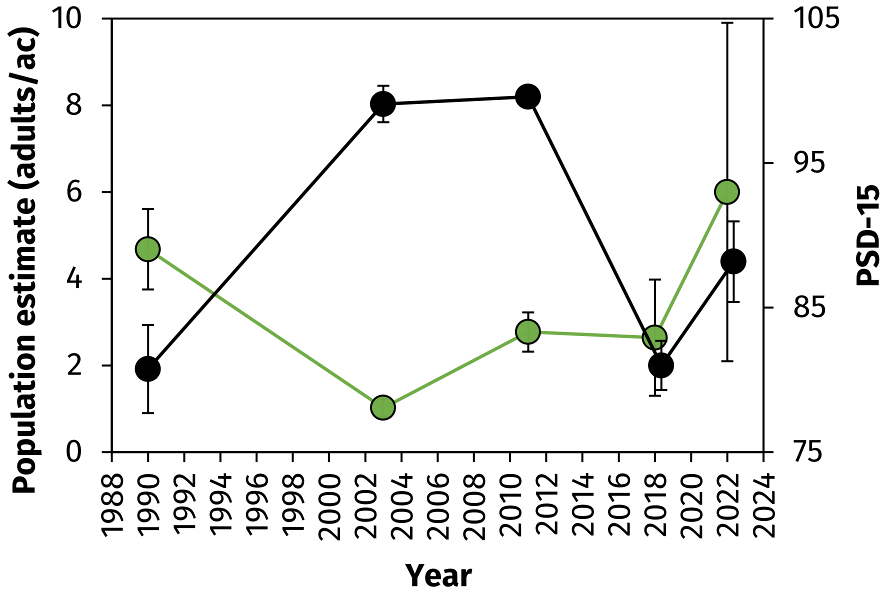

Figure 1. Adult walleye population estimates (± 95% CI; green circles) and PSD-15 (± 95% CI; black circles) during 1990, 2003, 2011, 2018 and 2022 fishery surveys.

Walleye size structure was good with 58.3% of the population above 18 inches and susceptible to harvest. Walleyes collected during the SN1 survey ranged in length from 12.9 – 25.4 inches, and the mean length of females and males was 21.3 inches and 16.2 inches, respectively (Figure 2). The PSD-15 from netting was 88 and PSD-20 was 29. These PSD index values remained similar temporally (Figure 1) and indicated a quality size structure that was well above the generally accepted range (PSD-15 = 30-60; Anderson and Weithman 1978) for balanced walleye populations. The male to female ratio was approximately 1:1.

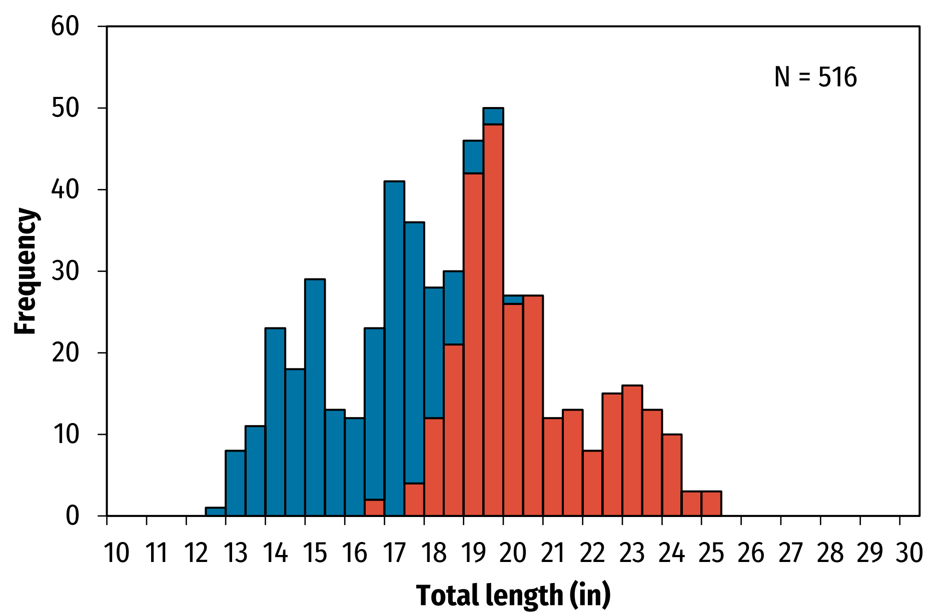

Figure 2. Length frequency of male (blue bars), female (red bars), and unknown sex (hollow bars) walleyes captured in Big Butternut Lake during the spring 2022 SN1 and SE1 surveys.

The mean W_r was 100, which indicated fish condition was above average and within the suggested range of 95 – 105 by Anderson (1980) for balanced fish populations.

Walleye ages ranged from 3 to 7, while age-3 and age-5 fish composed 96.5% of the population. Females ranged from 3 to 7 and males 2 to 5. Mean lengths at age during the 2022 survey were greater than those observed during the 1990 survey (average difference in mean length at age: +5.6 inches), those observed in complex-warm-dark Wisconsin lakes (average difference in mean length at age: +3.7 inches) and the Barron/Polk counties average (average difference in mean length at age: +3.6 inches; Figure 3). All comparisons used age-3 and age-5 fish. Length at age-5 was also greater than observed during the 2003 survey (average difference in mean length at age: +3.7 inches). Comparisons of growth to the 2011 survey were not possible (no age-3 and age-5 fish collected during 2011) but more closely resembled those observed during 2022 than previous surveys. Longevity of fish sampled during 2022 was considerably lower than observed during 1990 (age-18) and 2011 (age-13) and may be driven by increased growth rates. The von Bertalanffy growth model could not be fit to the observed age-length data. Walleye growth in Big Butternut Lake is well above average and has improved through time.

Stocking survival of large fingerling walleyes to age 3 was 39.6% and the cost per age-3 fish was estimated at $2.67. Age-3 walleyes were below harvestable size on average (16.8 inches) and were not fully mature; therefore, they may have been underrepresented in this survey. The survival rate was likely higher, and the cost per recruit lower, than estimated for age-3 fish. Survival to age 5 was 10.5% with the cost per age-5 fish estimated at $10.13. Age-5 fish were fully mature and susceptible to survey methods with a mean length of 21.9 inches. Survival of walleyes to age-5 in Big Butternut Lake was higher than most other recent estimates (survival to ages 4 or 5) of popular stocked walleye populations in Barron and Polk counties (ranged from 0.2 – 10.9%; indexed using 13 lakes during 2013 – 2021). However, tribal stocking of small fingerling walleyes occurred during 2017 and 2019. If recruited, this would have corresponded to age-3 and age-5 fish in the adult population and positively biased survival and cost-per-recruit estimates. Recruitment of stocked small fingerlings to the adult population remains unknown but is presumed to be poor. Survival to age 7 was 0.3% and the cost per age-7 fish was estimated at $309.64. Age-4 and Age-6 fish would have corresponded with non-stocked large fingerling years, composed 3.7% of the adult population and were either natural recruits or from the St. Croix Tribal small fingerling stockings. Recruitment of stocked fish to the adult population was excellent with high survival of stocked large fingerling year classes. Years in which large fingerlings were not stocked yielded weak year classes, evident by low abundances of age-6 fish. This suggests that natural recruitment remains low and survival of stocked small fingerlings was presumably poor.

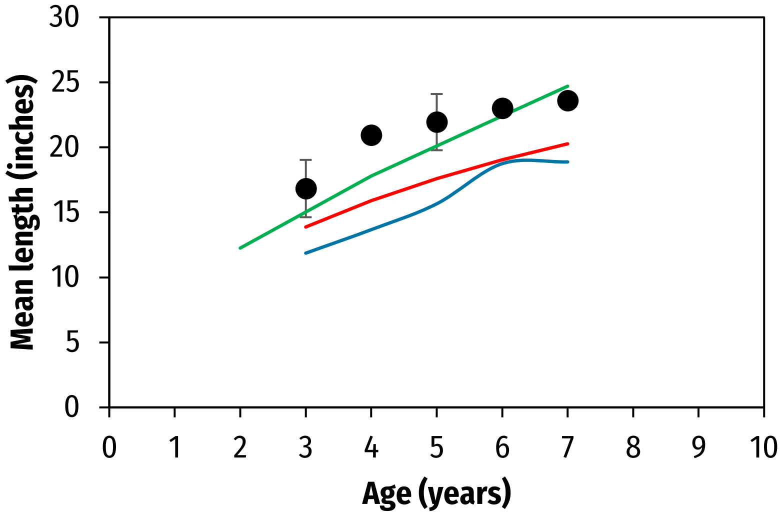

Figure 3. Mean length at age ± standard deviation of walleyes (black circles) in Big Butternut Lake. Mean length at age estimates during the 1990 and 2011 surveys are represented by the blue and green lines, respectively. The median length at age for similar complex-warm-dark Wisconsin lakes is represented by the red line. Mean length at age estimates for Barron/Polk counties were similar to the Lake Class estimates and not represented in the plot.

No age-0 walleyes were collected during the 2022 fall electrofishing survey. Age-0 fish collected during fall electrofishing surveys would either be from natural reproduction or small fingerling stockings, but catch rates of age-0 walleyes have been variable and low since initiation of extended growth stocking (1.0 ± 0.54 fish/mile; mean ± SE; 2007 – 2022). There were 32 age-1 walleyes collected during 2022 with a CPUE of 9.4 fish/mile. Age-1 walleyes ranged from 9.2 – 10.9 inches and would have corresponded with the fall 2021 stocking. Survival of large fingerlings stocked during 2022 to age 1 was 26.5% and the cost per age-1 fish was $4.00. Survival of stocked large fingerlings to age 1 has been good (19.6% ± 7.5%; mean ± SD; 2008 – 2022) and higher than mean survival rates observed for other 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). Stocking large fingerlings since 2005 has established a high-quality walleye fishery with high adult density, quality size structure and fast growth rates. Despite having an excellent stocked population, significant contributions of natural recruitment have not yet been observed. The Big Butternut walleye fishery remains stocking dependent to sustain a quality adult fishery, and large fingerling stockings will be maintained at approximately 10 fish/acre. The goal of large fingerling stocking will be to maintain an adult density of > 2 fish/acre. The year class strength of natural recruits and survival rates of stocked large fingerlings will be assessed every other year during years in which large fingerlings are not stocked.

Applying a more liberal walleye regulation could be considered for Big Butternut Lake due to the high survival of stocked fish and a lack of natural reproduction. Under the current 18-inch MLL regulation, 58.3% of the population was susceptible to harvest, with disproportionately higher susceptibility of females (97.8%) compared to males (13.3%). This is a common response following implementation of 18-inch MLL regulations due to body size dimorphism of adult walleyes. Surprisingly though, the sex ratio remained nearly 1:1. The 18-inch MLL regulation allows less angler harvest (compared to other toolbox regulation types) and is commonly used in rehabilitation scenarios where natural recruitment may be limited by low spawning stock abundance. However, Big Butternut Lake has a history of only negligible amounts of natural recruitment and remains stocking dependent. Establishing natural recruitment that would support a future self-sustaining population is unlikely. The current goal is to maintain a quality, stocked walleye fishery with high angler use and harvest opportunities. Reversion to the Ceded Territory base walleye regulation (15-inch MLL, 20 – 24-inch protected slot, three fish daily bag limit with only one fish > 24 inches) would increase harvest opportunities by approximately 12% (70.7% of population susceptible to harvest), likely decrease population density and improve size structure. Resource constituents of Big Butternut Lake should be assessed to gauge interest in a walleye regulation change to increase harvest.

NORTHERN PIKE

Big Butternut Lake supports a low to moderate density northern pike population with good size structure and growth. Fifty-two northern pike were sampled during the SN1 survey and the CPUE was 2.9 fish/net night. Northern pike CPUE was above the 50th percentile (1.7 fish/net night) for similar complex-warm-dark Wisconsin lakes and lower than the 2011 survey (4.0 fish/net night). Northern pike lengths ranged from 10.6 – 35.4 inches with an average length (sexes pooled) of 22.4 inches, which was similar to the 95th percentile for similar complex-warm-dark Wisconsin Lakes (Figure 4). The average length for males and females was 21.0 inches and 27.4 inches, respectively. The PSD-21 was 65 and remained similar to 2011 (PSD-21 = 67). The PSD-28 was 15 and PSD-34 was 6. These PSD index values were suggestive of good size structure and above the range proposed by Anderson and Weithman (1978) for balanced northern pike populations (PSD-21 = 30-60).

Northern pike ages ranged from 1 to 8, where females ranged from 3 to 8 and males 1 to 8. Mean lengths at age were similar to those observed during 2011 (average difference in mean length at age: -0.6 inches) but greater than the median length at age for similar complex-warm-dark Wisconsin lakes (average difference in length at age: +1.4 inches). The von Bertalanffy growth model could not be fit to the observed age-length data. The Mean W_r was 87, which indicated fish were in average condition. The ratio of males to females was approximately 3:1. A quality northern pike population was present that likely supports a quality recreational fishery with good harvest opportunities and potential for quality size fish. Northern pike will continue to be managed with a no MLL, 5 fish daily bag limit.

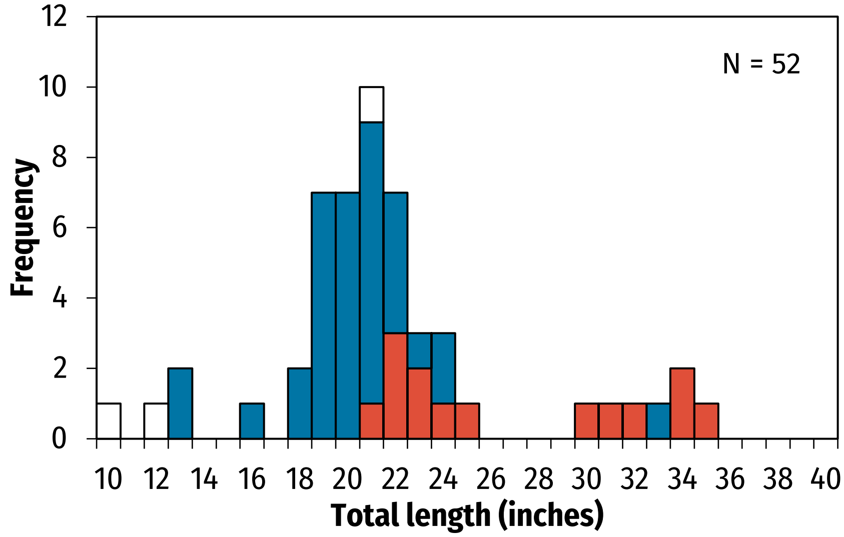

Figure 4. Length frequency of male (blue bars), female (red bars) and unknown sex (hollow bars) northern pike collected in Big Butternut Lake during the 2022 SN1 survey.

LARGEMOUTH BASS

Big Butternut Lake supports a quality largemouth bass population with moderate abundance, good size structure, growth rates and body condition. There were 121 largemouth bass collected during the SE2 survey with a CPUE of 35.6 fish/mile, which remained similar to 2003 (29.3 fish/mile), 2011 (34.7 fish/mile) and the 50th percentile (30.7 fish/mile) for similar complex-warm-dark Wisconsin lakes. The CPUE of largemouth bass ≥ 14 inches was 14.7 fish/mile and increased since 2003 (3.7 fish/mile) and 2011 (7.9 fish/mile).

Largemouth bass ranged in length from 6.5 - 18.9 inches with a mean length of 12.5 inches, which resembled the 95th percentile (12.5 inches) for similar complex-warm-dark Wisconsin lakes (Figure 5). The PSD-12 was 70 and PSD-14 was 43, which indicated a good size structure within the generally accepted values for balanced largemouth bass populations (PSD-12 = 40 – 70; Gabelhouse 1984). Size structure indices improved since 2003 (PSD-12 = 55 and PSD-14 = 13) and 2011 (PSD-12 = 48 and PSD-14 = 25).

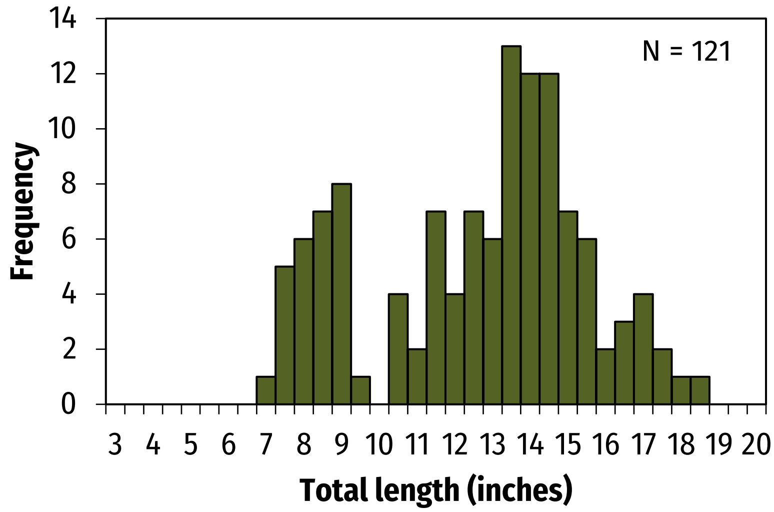

Figure 5. Length frequency of largemouth bass captured in Big Butternut Lake during 2022 SE2 survey.

Largemouth bass had above average growth rates, but slower growth was observed among the oldest year classes. Mean length at age was greater than the median length at age standard for similar complex-warm-dark Wisconsin lakes (average difference in length at age estimates: +1.9 inches; ages 2 – 7; Figure 6) and the Northern Region estimates (average difference in mean length at age estimates: +2.3 inches; ages 2 – 7; Figure 6). However, growth slowed after age 7 and was similar to both the lake class and Northern Region estimates. The predicted theoretical maximum length using von Bertalanffy growth models was 18.9 inches with k and t_0 estimated to be 0.27 and -0.83, respectively. The mean W_r was 115, which indicated fish were in excellent overall condition (Bennett 1970).

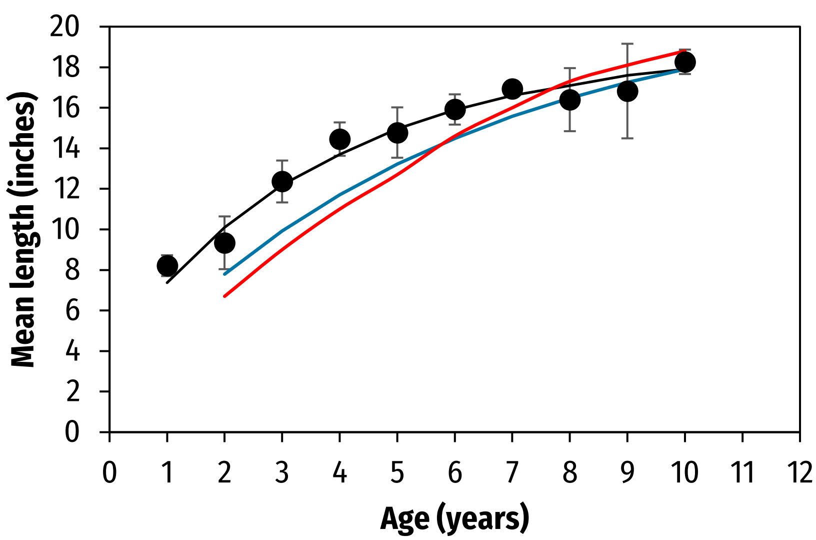

Figure 6. Largemouth bass mean length-at-age (black circles) ± standard deviation from Big Butternut Lake during 2022. The von Bertalanffy growth model is represented by the black line. Median length-at-age estimates for similar complex-warm-dark Wisconsin Lakes are modeled by the blue line and the Northern Region mean length-at-age estimates are modeled by the red line.

Total annual mortality estimated from a catch curve regression model was 37.8% (ages 4 – 10; R^2 = 0.71; Figure 7). Annual mortality rates were moderate which could be related to population longevity (no age-10+ fish observed), underestimation of ages and/or the current liberal harvest regulations (no MLL, 5 fish daily bag limit).

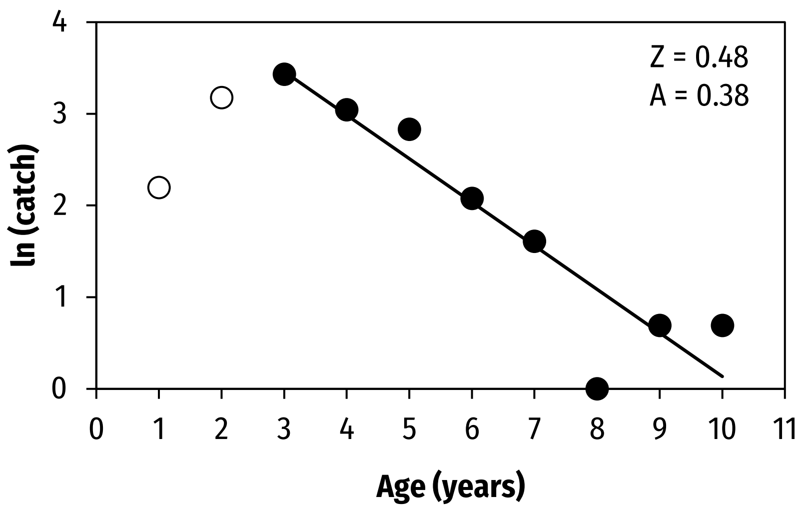

Figure 7. Catch curve analysis plot for the natural logarithm of the catch for each age class of largemouth bass used in the analysis (black circles) and not (white circles). Z = instantaneous total mortality, A = annual total mortality rate.

The no MLL regulation was implemented shortly following the 2003 survey with the intent to reduce adult densities and support walleye population growth. Population abundance remained temporally stable (similar to 2003 and 2011) although notable changes in size distributions occurred. The abundance of largemouth bass > 14 inches increased with corresponding increases in population size structure. The no MLL regulation appeared to improve population size structure and will be maintained to continue to support a quality largemouth bass population. Big Butternut Lake offers anglers a quality largemouth bass fishery with good harvest opportunities.

BLUEGILL

A total of 163 bluegill were collected during the SE2 survey (Figure 8). Bluegill CPUE was 163.0 fish/mile, which was near the 75^{th} percentile (183.5 fish/mile) for similar complex-warm-dark Wisconsin Lakes and increased since 2011 (77.9 fish/mile). The CPUE of quality size (≥ 6 inches) fish was 132.0 fish/mile (81.0% of catch) and similarly increased since 2011 (33 fish/mile; Gabelhouse 1984).

Lengths ranged from 2.0 – 8.9 in with an average length of 7.0 inches (Figure 8). The mean length was above the 99th percentile for similar complex-warm-dark Wisconsin lakes. The PSD-6 was 81 and the PSD-8 was 27. Both PSD index values were well above the generally accepted range for balanced bluegill populations (PSD-6 = 20-60, PSD-8 = 5-20; Anderson 1985). Collectively, this represented a bluegill population with above-average size structure. Despite this, fish > 9 inches were not observed during the survey.

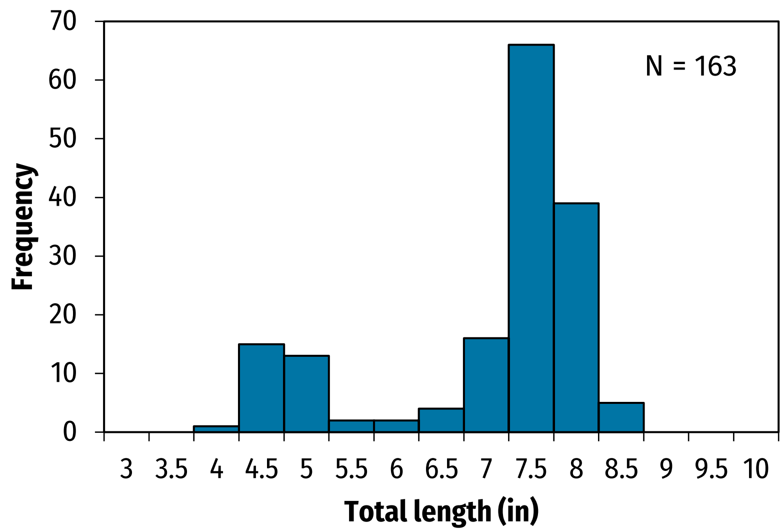

Figure 8. Length frequency of Bluegill collected from Big Butternut Lake during the 2022 SE2 survey.

Bluegill had average growth rates. Mean length at age was similar to median length at age estimates for similar complex-warm-dark Wisconsin lakes (average difference in length at age estimates: -0.2 inches; ages 1 – 9; Figure 9) and the average for Barron and Polk counties (average difference in mean length at age estimates: +0.2 inches; ages 1 – 9; Figure 9). The predicted theoretical maximum length using von Bertalanffy growth models was 10.6 inches with k and t_0 estimated to be 0.16 and -0.56, respectively.

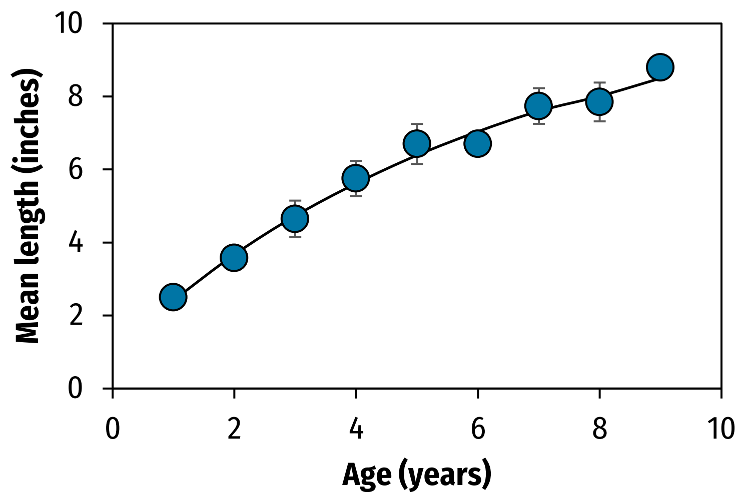

Figure 9. Bluegill mean length-at-age (blue circles) ± standard deviation from Big Butternut Lake during 2022. The von Bertalanffy growth model is represented by the black line. Median length-at-age estimates for similar complex-warm-dark Wisconsin Lakes and mean length-at-age estimates for Barron and Polk counties were similar to Big Butternut and not represented in the plot.

A moderate density bluegill population was present in Big Butternut Lake with above-average size structure and moderate growth rates, which has likely provided anglers consistent and quality harvest opportunities. A recent creel survey has not been conducted on Big Butternut Lake, but during 2003, directed angler effort for bluegill was 20.8 hours/acre, which was near average for Barron and Polk counties (24.8 hours/acre; estimated using the most recent year-round creel surveys from 19 lakes). Directed angler effort for bluegill likely remains moderate compared to other popular fisheries in the area. The current population does not satisfy the benchmark criteria set forth by the DNR Panfish Management Team for lakes having a size structure problem due to angler harvest (mean length < 6 inches & mean length at age-3 ≥ 4.2 inches). Thus, the current harvest regulations for panfish will be maintained and no additional management actions are required at this time.

OTHER PANFISH

Two yellow perch and five black crappies were sampled during the SE2 survey.

Management Recommendations

1.) The adult walleye population should be maintained at a target density of > 2 fish/acre by continuing to stock large fingerling (6-8 inches) walleyes in alternate years at a rate of 10 fish/acre. Stocking on an alternate year basis will enable us to continue fall electrofishing evaluations of natural reproduction and survival of stocked large fingerlings.

2.) The Ceded Territory base walleye regulation (15-inch MLL, 20 – 24-inch protected slot, three fish daily bag limit with only one fish > 24 inches) should be considered to increase angler harvest opportunities. Resource constituents of Big Butternut Lake should be assessed to gauge interest in a walleye regulation change to increase harvest.
3.) No specific management actions regarding northern pike, bluegill, black crappie and yellow perch are recommended at this time. Otoliths should be collected from bluegill and black crappie during the next survey to improve age and growth estimation.
4.) The next comprehensive fisheries survey is scheduled for 2031. We recommended not stocking small fingerling walleyes during the next survey year to better evaluate the contribution of natural recruitment to the fishery.
5.) Efforts to increase habitat complexity in Big Butternut 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. The website healthylakeswi.com is a great resource to learn about this recommendation.
6.) Invasive species monitoring and control programs should continue. Efforts to keep aquatic invasive species out of a waterbody are much more effective than controlling invasive species once they are established.

Acknowledgments

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Appendices

Table 1. DNR fish stocking records for Big Butternut Lake, 2001 – 2021. Asterisk denotes St. Croix Tribal stocking.

YEAR	SPECIES	AGE CLASS	NUMBER STOCKED	AVG. LENGTH (IN)
2021	walleye	Large Fingerling	3,815	6.2
2019	walleye	Large Fingerling	3,779	6.5
2019	*walleye	Small Fingerling	16,385	1.9
2017	walleye	Large Fingerling	3,780	6.8
2017	*walleye	Large Fingerling	2,634	7.4
2017	*walleye	Small Fingerling	21,971	2.3
2016	*walleye	Small Fingerling	10,389	2.0
2015	walleye	Large Fingerling	3,845	7.4
2013	walleye	Large Fingerling	3,780	6.4
2011	walleye	Large Fingerling	3,780	6.6
2011	walleye	Small Fingerling	7,532	2.1
2009	walleye	Large Fingerling	3,780	6.5
2007	walleye	Large Fingerling	3,780	6.4
2005	walleye	Large Fingerling	3,780	7.2
2003	walleye	Small Fingerling	18,900	1.6
2001	walleye	Small Fingerling	18,900	1.8

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