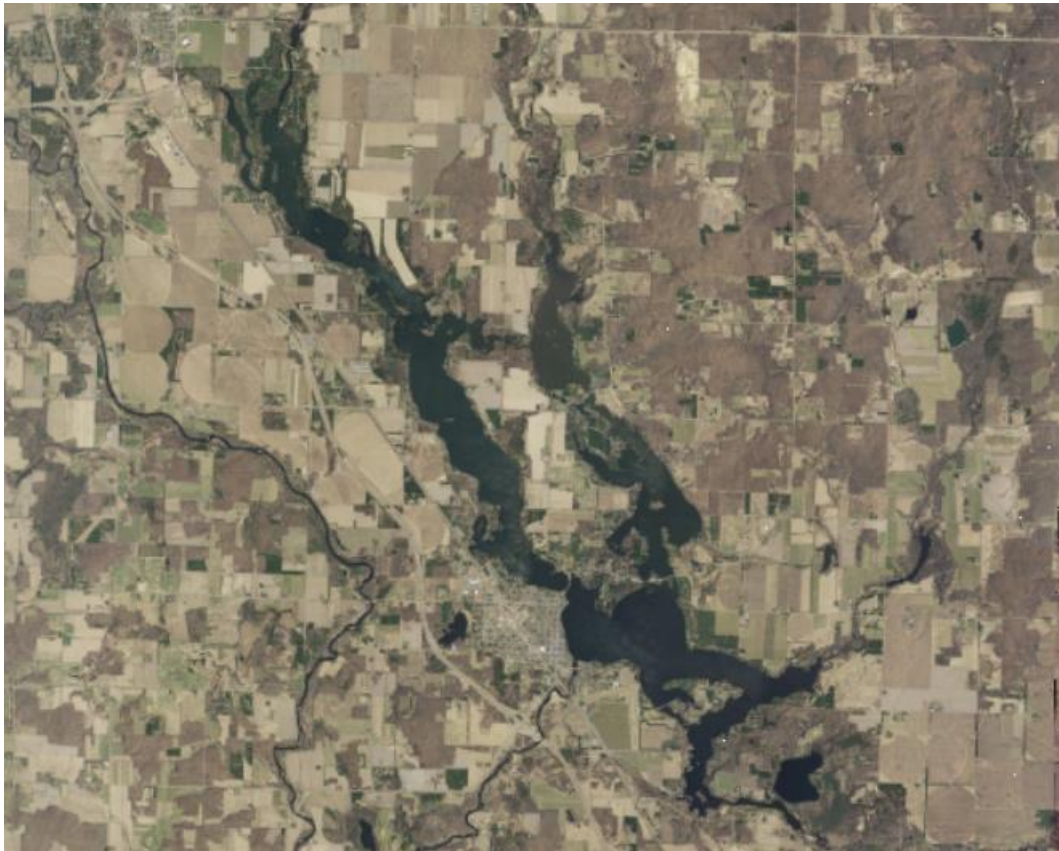


WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Fishery Survey Report for Prairie and Pokegama lakes
Barron County, Wisconsin 2018
WATERBODY IDENTIFICATION CODES: 2094100 AND 2094300



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Introduction

Prairie and Pokegama lakes were surveyed in 2018 to assess the status of their fisheries. These two lakes are part of the Chetek Chain of Lakes, which is 3,764 acres total. Other lakes in the Chetek Chain include Chetek, Tenmile and Ojaski. All lakes have similar habitat and characteristics, so the results of this survey were considered a representation of the entire Chetek Chain of Lakes. We conducted a population estimate for adult walleye and indexed the catch rates of largemouth bass, smallmouth bass, northern pike, and panfish species. We assessed general population characteristics, size structure (when possible), and growth of all species. Recent management activities on the Chetek Chain of Lakes have focused on walleye stocking, winter aeration, public outreach, assistance with fish stick projects and education.

LAKE CHARACTERISTICS

Prairie and Pokegama lakes are both very fertile and shallow lakes (Tables 1 & 2) that experience heavy algal blooms during summer. More information on water quality and invasive species can be found at the Wisconsin Department of Natural Resources (DNR) Lake Page for [Prairie](#) and [Pokegama](#) lakes.

Table 1. Lake and watershed characteristics for Prairie and Pokegama lakes, Barron County, WI.

	Prairie Lake	Pokegama Lake
Size (ac)	1,534	506
Max depth (ft)	16	19
Mean depth (ft)	9	11
Watershed Area (ac)	14,619	40,482
Lake class	Complex warm-dark	Complex warm-dark

Table 2. July-August mean [Trophic State Index \(TSI\)](#) values for Prairie and Pokegama lakes, Barron County, WI.

Trophic State Index	Prairie Lake	Pokegama Lake
Secchi Disk Visibility	69	68
Total Phosphorus	68	65
Chlorophyll A	67	68

There are 11 public boat landings throughout the Chetek Chain. There are also two public fishing piers on the Chetek Chain, one at Brown's Landing on Prairie Lake and the other on the south end of Pokegama Lake off CTH D. The Chetek Chain also supports 26 resorts, many of which have private landings. The Chetek Chain of Lakes receives heavy fishing pressure and is a well-known producer of quality panfish.

STOCKING HISTORY

Walleye have been the only species stocked into the Chetek Chain in recent decades (Appendix Table 1). Since the beginning of the Wisconsin Walleye Initiative in 2013, large fingerling walleye have been stocked by the DNR at a rate of 10 fish/acre during odd-numbered years. In addition, a local group called "Walleyes for Chetek" has purchased large fingerling walleyes from a private producer and stocked up to 15,000 fish during even-numbered years.

FISHING REGULATIONS

The Chetek Chain of Lakes has only one special regulation: the 26-inch minimum length limit and 2-fish daily bag limit for northern pike. All other species follow statewide or Ceded territory regulations (Appendix Table 2).

Methods

Prairie and Pokegama lakes were sampled during 2018, following the DNR's comprehensive treaty assessment protocol ([Cichosz 2019](#)) to estimate the adult walleye population abundance and index northern pike.

A late spring electrofishing survey (SE2) was done to assess the bass and panfish populations. This survey consisted of 0.5-mile index stations where all gamefish and panfish were captured, and 1.5-mile stations where only gamefish were collected. There were three index stations and gamefish stations completed on Pokegama Lake and four index stations and gamefish stations completed on Prairie Lake.

In addition to these surveys, a fall electrofishing survey was done on both lakes to assess the abundance of age-0 and age-1 walleye. Fall electrofishing surveys have occurred periodically from 1993 to 2018. Descriptions of standard DNR survey type, gear used, target water temperatures and target species are listed in Appendix Table 3.

Lake Class Standards catch per unit effort (CPUE) was calculated by comparing Prairie and Pokegama lakes CPUEs of each species to the CPUEs of the other 196 complex-warm-dark lakes in Wisconsin ([Rypel et al. 2019](#)). When possible, CPUE was also compared to past surveys for these lakes.

Walleye and largemouth bass were aged with dorsal spines. Bluegill and black crappie were aged with scales. All spines were cut with a Dremel tool and aged under a microscope. Mean length-at-age was compared to the median length at age for complex-warm-dark lakes. 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 (Appendix Table 4).

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. 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 and age 5 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 estimate was 1.5 fish/acre (CV = 0.10) for Prairie Lake and 2.2 fish/acre (CV = 0.23) on Pokegama Lake (Figures 1 & 2). These estimates increased from the 2012 survey when both lakes had adult walleye densities of 0.5 fish/acre and were similar to the 2001 estimates for each lake. In addition, the 2018 estimates were above the average found in stocked walleye lakes in the Ceded Territory (1.4 fish/acre; Cichosz 2019).

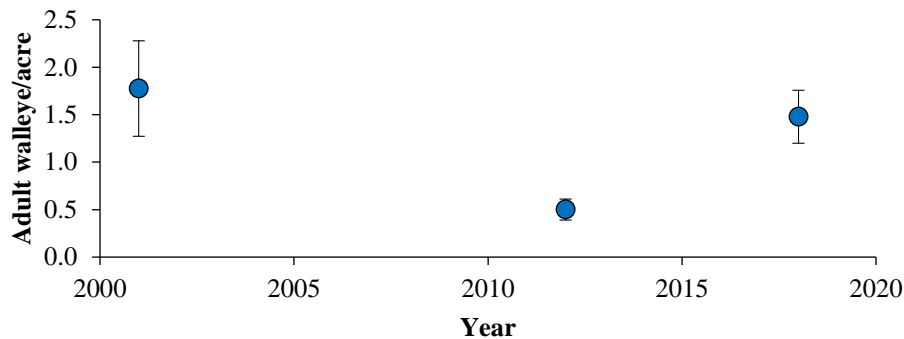


Figure 1. Population estimates for adult walleye (with 95% confidence intervals) in Prairie Lake, Barron County, WI, 2001-2018.

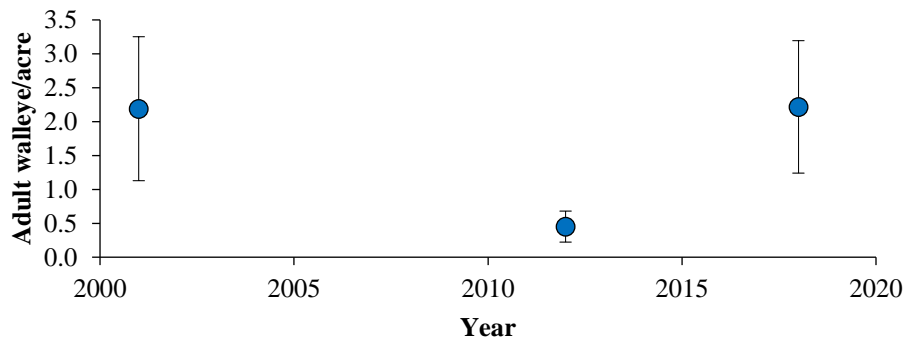


Figure 2. Population estimates for adult walleye (with 95% confidence intervals) in Pokegama Lake, Barron County, WI, 2001-2018.

A total of 933 walleye were collected netting and electrofishing on Prairie Lake (Figure 3). The CPUE was 34.5 fish/net night for netting and 29.7 fish/mile for electrofishing. The netting catch rate was above the 99th percentile (30.4 fish/net night) for complex warm-dark fisheries in Wisconsin. The high netting catch rate was influenced by the late ice out and short spawning season. Walleye ranged in length from 7.5 to 26.7 inches. The mean lengths of male and female walleye were 14.5 inches and 19.2 inches, respectively. The male to female ratio was 2.7:1 (Figure 2). Walleye PSD from fyke netting was 45 and PSD-20 was 10. PSD in 2012 was higher at 97 and PSD-20 was 17, likely due to a lower density and older population.

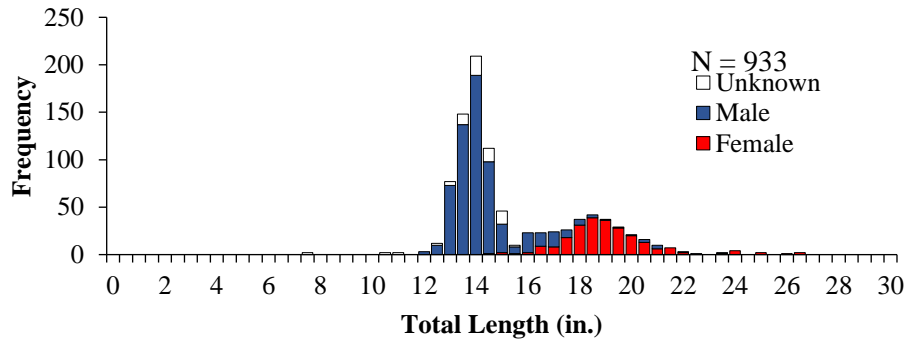


Figure 3. Length frequency of all walleye captured in Prairie Lake during the spring 2018 walleye population estimate survey (N = 933).

A total of 453 walleye were collected netting and electrofishing on Pokegama Lake (Figure 4). The CPUE was 17.7 fish/net night for netting and 30.0 fish/mile for electrofishing. The netting catch rate was above the 90th percentile (13.8 fish/net night) for complex warm-dark fisheries in Wisconsin. Walleye ranged in length from 7.2 to 27.2 inches. The mean lengths of male and female walleye were 14.5 inches and 20.0 inches, respectively. The male to female ratio was 1:1. Walleye PSD from fyke netting was 57 and PSD-20 was 21. PSD in 2012 was higher at 96 and PSD-20 was 24.

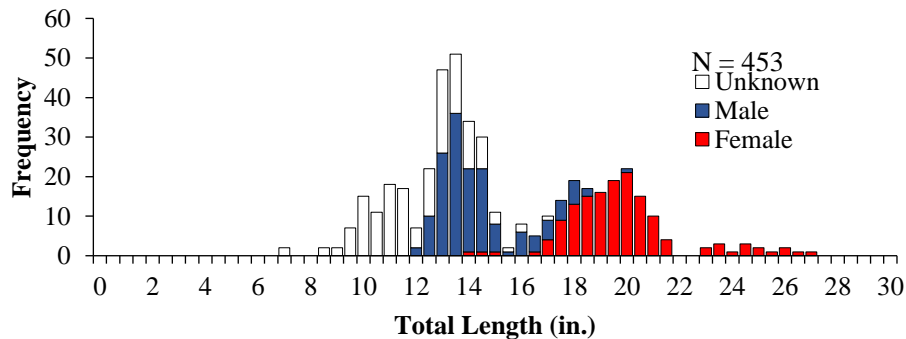


Figure 4. Length frequency of all walleye captured in Pokegama Lake during the spring 2018 walleye population estimate survey (N = 933).

Walleye had fast growth rates and were well above the median for complex warm-dark lakes and were also greater than the Barron and Polk county averages. Mean length at age for age 3 to 5 walleye from Prairie and Pokegama (both lakes combined) averaged 2.9 inches more than the lake class median and 0.9 inches more than the Barron and Polk county averages.

A large portion of the walleye fishery in each of the lakes was comprised of the 2013 (age 3) and 2015 (age 5) year classes. Age-3 walleye comprised 55.0% of the sample in Prairie and 38.2% of the sample in Pokegama. Age-5 walleye comprised 32.3% of the population in Prairie Lake and 39.0% of the population in Pokegama Lake. The survival to age-3 was 8.9% for Prairie Lake and cost per age-3 walleye was estimated at \$11.96. The survival to age-3 was 9.9% for Pokegama Lake and the cost per age-3 walleye was estimated at \$10.71. Age-3 females were not fully mature and therefore not fully represented in this survey. The survival rate was likely

higher and the cost per recruit lower than estimated for age-3 walleye. The survival to age-5 was 4.8% for Prairie Lake and the cost per age-5 walleye was estimated at \$22.15. The survival to age-5 was 8.7% for Pokegama Lake and the cost per age-5 walleye was estimated at \$12.25. By age 5, walleye in Prairie and Pokegama were of legal size (15 inches) for nearly two years; therefore, angler harvest likely reduced the year class.

The age-0 walleye catch rate during the fall electrofishing survey was 0.1 fish/mile on Prairie Lake and 0.2 fish/mile on Pokegama Lake. Only one age-0 walleye was caught in either lake. The age-1 catch rate was 0.5/mile in both Prairie and Pokegama lakes. The age-1 catch rate would have corresponded to the 2017 stocking event. This catch rate would indicate poor survival; however, a heavy algae bloom caused poor water visibility during the fall electrofishing survey. Considering the high survival observed during the survival to recruit analyses, the age-1 walleye catch rate was likely underestimated.

The walleye population in the Chetek Chain is stocking-dependent with minimal natural reproduction. Large fingerling walleye stocked into the Chetek Chain of Lakes have had high survival and have successfully returned a fishable stocked walleye fishery to the Chetek Chain of Lakes. As more year classes are stocked into the Chetek Chain, the adult walleye density is likely to continue to increase, especially considering the current population was largely composed of only two year classes.

NORTHERN PIKE

A low number of northern pike were collected from either lake (Figure 5). There were 19 northern pike collected netting from Prairie Lake and their lengths ranged from 18.0 inches to 38.0 inches. The average length was 24.3 inches, above the 95th percentile (24.1 inches) for complex warm-dark lakes. The CPUE for northern pike was 0.95 fish/net night, a slight decrease from 2012 (1.1 fish/net night). The netting catch rate was slightly below the 50th percentile (1.23 fish/net night) for complex warm-dark fisheries in Wisconsin.

There were 16 northern pike collected netting from Pokegama Lake and their lengths ranged from 19.0 inches to 37.0 inches. The average length was 24.5 inches, above the 95th percentile (24.1 inches) for complex warm-dark lakes. Age analyses and PSD were not calculated due to the small sample size. The CPUE for northern pike was 0.9 fish/net night, a slight increase from 2012 (0.6 fish/net night). The netting catch rate was below the 50th percentile (1.23 fish/net night) for complex warm-dark fisheries in Wisconsin.

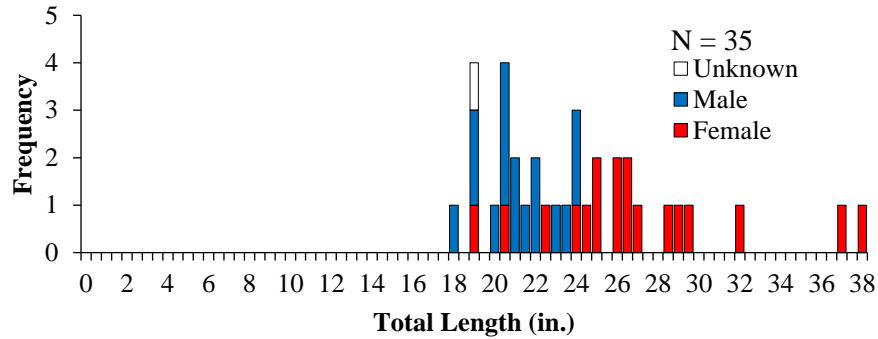


Figure 5. Length frequency of all northern pike captured in Prairie Lake (N = 19) and Pokegama Lake (N = 16) during spring 2018 fyke netting survey (N = 35).

Based on the habitat characteristics of the Chetek Chain of Lakes, the northern pike population is likely to remain a low density, high size structure population. The Chetek Chain is a fertile system with a strong forage base, which makes it capable of growing large pike. With the low density and high size structure, coupled with high angling pressure, the 26-inch minimum length limit, two fish bag limit remains a good regulation for the Chetek Chain of Lakes.

LARGEMOUTH BASS

There were 169 largemouth bass collected on Prairie Lake during the SE2 survey and their lengths ranged from 6.8 to 16.2 inches (Figure 6). PSD was 35. The mean length was 11.0 inches, which was above the 50th percentile for complex warm-dark Wisconsin lakes. The electrofishing catch rate was 21.1 fish/mile, which was greater than the 2012 catch rate (14.5 fish/mile) and also above the 50th percentile (17.4 fish/mile) for complex warm-dark fisheries in Wisconsin.

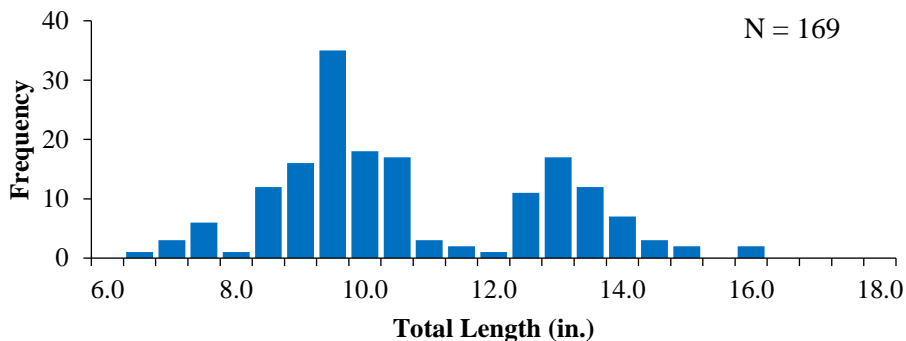


Figure 6. Length frequency of largemouth bass captured from Prairie Lake during late spring electrofishing survey.

There were 84 largemouth bass collected on Pokegama Lake during the SE2 survey and their lengths ranged from 7.3 to 17.0 inches (Figure 7). PSD was 36. The mean length was 11.6 inches, which was above the 50th percentile for complex warm-dark Wisconsin lakes. The electrofishing catch rate was 14.0 fish/mile and slightly less than the 2012 catch rate (16.2 fish/mile) and was also below the 50th percentile (17.4 fish/mile) for complex warm-dark fisheries in Wisconsin.

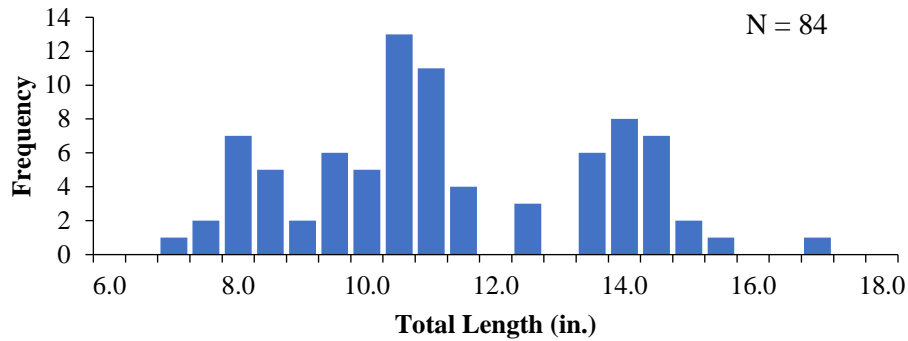


Figure 7. Length frequency of largemouth bass captured from Pokegama Lake during late spring electrofishing survey.

Largemouth bass growth in both lakes was average when compared to complex-warm dark lakes. The largemouth bass populations in both lakes have moderate abundance with decent size structure. Although the largemouth bass population is not considered abundant, they still serve an important role of providing predatory pressure on the panfish populations.

SMALLMOUTH BASS

No smallmouth bass were collected on Prairie Lake, but 10 smallmouth bass were collected on Pokegama Lake. Lengths of smallmouth bass ranged from 9.0 to 13.0 inches and the mean length was 10.7 inches, which was above the 75th percentile (9.6 inches) for complex two-story lakes. CPUE was 1.7 fish/mile and above the 50th percentile for warm-dark fisheries in Wisconsin. PSD and growth data were not analyzed due to low sample size.

The smallmouth bass population on the Chetek Chain is considerably less abundant than the largemouth bass population and provides a “background fishery” for anglers interested in catching bass. Due to the habitat characteristics of the Chetek Chain, the smallmouth population is expected to remain at low levels.

BLUEGILL

There were 97 bluegill collected from Prairie Lake during the SE2 survey and their lengths ranged from 3.4 to 9.3 inches (Figure 8). The mean length was 5.6 inches, which was above the 95th percentile (5.3 inches) for complex warm-dark lakes. Bluegill CPUE was 48.5 fish/mile, which was less than the catch rate in 2012 (91.0 fish/mile) and below the 25th percentile for complex warm-dark lakes. Bluegill PSD was 34 and PSD-8 was 5. Bluegill growth was average when compared to complex-warm dark lakes.

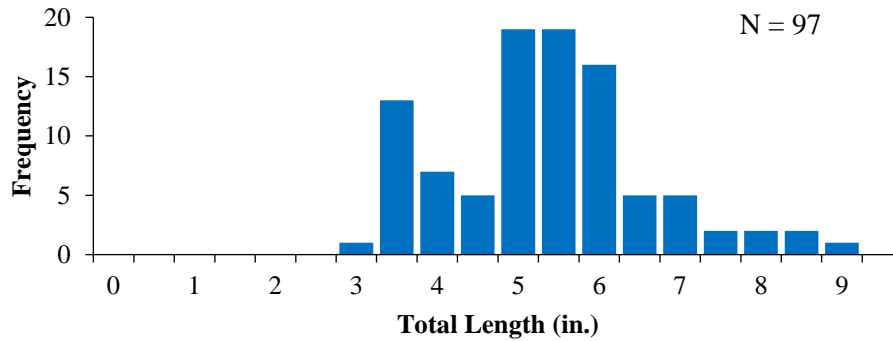


Figure 8. Length frequency of bluegill captured from Prairie Lake during late spring electrofishing survey.

There were 150 bluegill collected from Pokegama Lake during the SE2 survey and their lengths ranged from 3.2 to 9.3 inches (Figure 9). The mean length was 6.3 inches, which was above the 99th percentile (6.1 inches) for complex warm-dark lakes. Bluegill CPUE was 100.0 fish/mile, which was just below the 2012 catch rate (108 fish/mile) and the 50th percentile (117.0 fish/mile) for complex warm-dark lakes. Bluegill PSD was 63 and PSD-8 was 3. Bluegill growth was average when compared to complex-warm dark lakes.

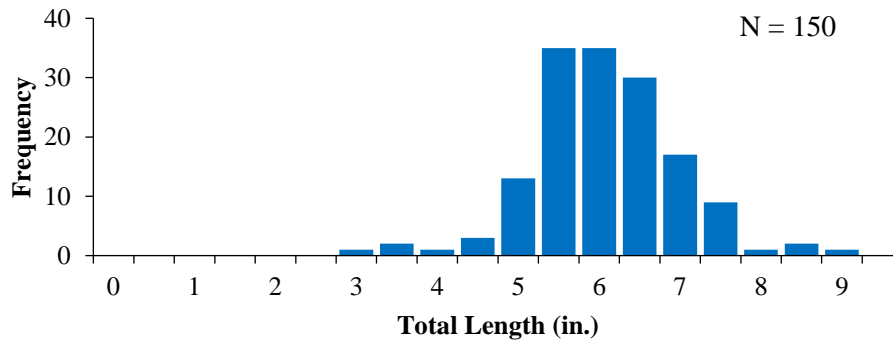


Figure 9. Length frequency of bluegill captured from Pokegama Lake during late spring electrofishing survey.

BLACK CRAPPIE

There were 84 black crappie collected from Prairie Lake during the SE2 survey and their lengths ranged from 5.3 to 10.4 inches (Figure 10). The mean length was 8.1 inches, which was above the 95th percentile (7.7 inches) for complex warm-dark lakes. Black crappie CPUE was 42.0 fish/mile, which was greater than the 2012 catch rate (22.5 fish/mile). Black crappie PSD was 60 and PSD-10 was 6. Prairie Lake black crappies averaged 0.9 inches less when compared to age 4 to 7 crappies from other complex-warm dark lakes.

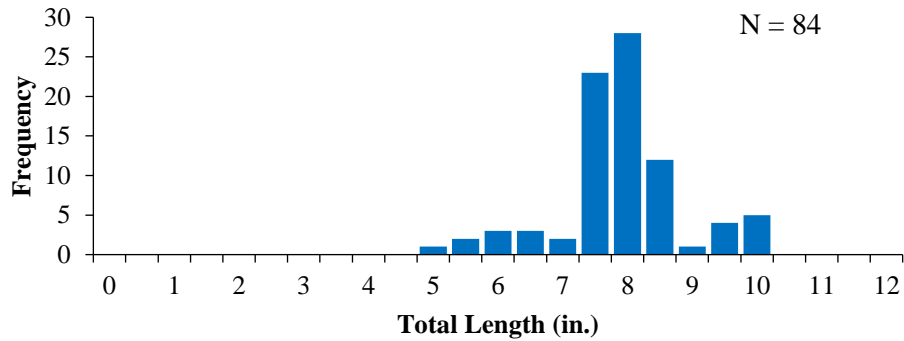


Figure 10. Length frequency of black crappie captured from Prairie Lake during late spring electrofishing survey.

Considerably fewer crappies were collected in Pokegama Lake. There were 17 black crappie collected from Pokegama Lake during the SE2 survey and their lengths ranged from 6.3 to 10.2 in (Figure 11). The mean length was 8.0 in, which was above the 95th percentile (7.7 in) for complex warm-dark lakes. Black crappie CPUE was 11.3 fish/mile, which was less than the 2012 survey (55.3 fish/mile). PSD was not calculated due to the small sample size. Pokegama Lake black crappies averaged 0.8 in less when compared to age 4 to 7 crappies from other complex-warm dark lakes.

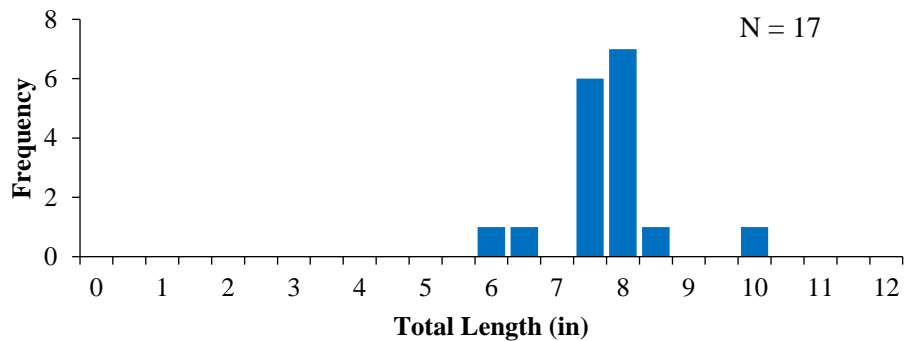


Figure 11. Length frequency of black crappie captured from Pokegama Lake during late spring electrofishing survey.

Bluegills and black crappies are the two most abundant species in the Chetek Chain. The majority of the angler effort and harvest is likely directed at these two species. Panfish in the Chetek Chain face high angler pressure. During the most recent angler creel survey (2012), open water angler effort on Prairie Lake (85.7 hours/ac) was 273% greater than the Barron and Polk County average. Similarly, open water angler effort on Pokegama Lake (142.7 hours/acre) was 454% greater than the Barron and Polk County average. Despite the high effort and harvest, the Chetek Chain of Lakes continues to produce high numbers of quality panfish on a regular basis. The Chetek Chain is a productive waterbody that seems to withstand high harvest

YELLOW PERCH

Yellow perch were collected in low numbers in both lakes during the late spring electrofishing surveys and were also present during the fyke netting surveys. Six yellow perch were collected from Prairie Lake during the SE2 survey. The average length of yellow perch was 8.0 inches with a range of 5.5 to 11.0 inches. There were 17 yellow perch collected from Pokegama Lake during the SE2 survey. The average length of yellow perch was 7.8 inches with a range of 6.5 to 9.0 inches.

With desirable-sized yellow perch present in the Chetek Chain, the population contributes to the overall panfish fishery. In addition, the yellow perch population likely serves an important role as prey fish for the walleye population.

WHITE BASS

Although white bass were not sampled during the SE2 survey, six age-0 white bass were observed in Pokegama Lake during the fall electrofishing survey. White bass have occasionally been caught by anglers in the Chetek Chain in low numbers. However, during 2019 and 2020, we received several calls and emails from anglers that caught white bass in the Chetek Chain who hadn't caught them previously. There appears to have been a white bass year class produced in 2018 because anglers were reporting fish that appeared to be from the 2018 year class, based on their size.

The future of the white bass population in the Chetek Chain is unknown. The Chetek Chain is not a riverine system, so we are unsure how the white bass population will fare into the future. For now, white bass provide a bonus harvest opportunity for panfish anglers.

Management Recommendations

- 1.) Large fingerling walleye stockings have improved the walleye fishery and performed better than small fingerlings that were historically stocked in the Chetek Chain. The current alternate year walleye stocking program between the DNR and Walleyes for Chetek stocking should continue (contingent upon availability from DNR hatcheries). An adult walleye density of 2-3 adults/ac could be achievable as more year classes recruit to the fishery. No changes to regulations should be made.
- 2.) Bluegill and crappie populations continue to be in good shape. These populations support a popular fishery. Despite the high angling pressure (273 to 454% more than Barron and Polk average), the bluegill and crappie populations continue to provide a respectable fishery due to the high fertility of the Chetek Chain. No regulation changes are recommended at this time.
- 3.) Northern pike have low density and high size structure. The northern pike population is likely limited by shallow vegetation used for spawning. Further protection of these areas is recommended. The current 26 in minimum length limit and two fish bag limit should remain.
- 4.) The largemouth bass population is healthy with good size structure and moderate catch rates. No changes are recommended for the current regulation.

- 5.) The next comprehensive survey (with SN1, SE1, SE2, and FE) is planned for 2025. The success of the large fingerling stocking should be further evaluated during that survey by assessing the abundance, age structure, population demographics, and stocking survival of the walleye population. Due to the importance of the panfish fishery, the size structure and abundance of the panfish populations should continue to be closely monitored as well.
- 6.) Winter aeration has prevented major fish kills on the upper end of Prairie Lake. The Prairie Lake aeration project should continue in cooperation between the DNR, the local townships and Barron County.
- 7.) Efforts to increase habitat complexity in the Chetek Chain should also be encouraged where applicable. Inputs of coarse woody debris, protection/promotion of aquatic vegetation and maintenance/restoration of vegetative buffers are needed habitat work for the Chetek Chain. This website healthylakeswi.com is a great resource to learn about this recommendation.
- 8.) 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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Appendix Table 1. Fish stocking records for the Chetek Chain of Lakes (all lakes combined), 1990 – 2019.

Year	Species	Age Class	Number Stocked	Avg. length (in)
1990	Walleye	Small Fingerling	107,104	3.0
1990	Walleye	Fry	500,000	1.0
1992	Walleye	Small Fingerling	117,456	3.5
1994	Walleye	Small Fingerling	85,896	2.5
1997	Walleye	Small Fingerling	51,000	2.8
2000	Walleye	Small Fingerling	123,016	1.6
2001	Walleye	Small Fingerling	118,545	1.7
2003	Walleye	Small Fingerling	118,520	1.8
2005	Walleye	Small Fingerling	217,117	1.6
2006	Walleye	Large Fingerling	5,000	7.0
2007	Walleye	Small Fingerling	97,959	2.1
2008	Walleye	Large Fingerling	4,716	8.0
2009	Walleye	Small Fingerling	118,545	1.8
2010	Walleye	Large Fingerling	250	8.0
2010	Walleye	Yearling	2,000	10.0
2011	Walleye	Large Fingerling	3,000	9.0
2011	Walleye	Small Fingerling	132,489	1.6
2012	Walleye	Large Fingerling	3,030	7.0
2013	Walleye	Large Fingerling	37,810	6.6
2014	Walleye	Large Fingerling	4,000	7.0
2015	Walleye	Large Fingerling	34,935	7.3
2016	Walleye	Large Fingerling	10,000	7.0
2017	Walleye	Large Fingerling	39,660	3.9
2018	Walleye	Large Fingerling	15,000	7.0
2019	Walleye	Large Fingerling	35,594	6.2

Appendix Table 2. Regulation history for the Chetek Chain of Lakes, Barron County from 1980 to 2020. * a sliding bag limit for walleye (1–5 fish) was in place from 1986 to 2015. ** After 2015, the Ceded Territory walleye base regulation was 15" minimum length limit (MLL), 20-24" protected, and one fish over 24" may be taken and 3 bag limit.

Species	1980	1985	1990	1995	2000	2005	2010	2015
Walleye	No MLL, 5 fish daily bag limit*			15" MLL, 5 fish daily bag limit*				CT base**
Northern Pike	No MLL, 5 fish daily bag limit			26" MLL, 2 fish daily bag limit				
Bass	No MLL, 5 daily bag limit		14" MLL, 5 fish daily bag limit					
Panfish	No MLL, 50 fish daily bag limit			No MLL, 25 fish daily bag limit				

Appendix Table 3. 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



A DNR Technician lifting a fyke net



A DNR electrofishing boat

Appendix Table 4. Proportional and relative stock density values.

Species	Stock Size (in)	Quality Size (in)	Preferred Size (in)
Black Crappie	5	8	10
Bluegill	3	6	8
Largemouth Bass	8	12	15
Northern Pike	14	21	28
Pumpkinseed	3	6	8
Rock Bass	4	7	9
Smallmouth Bass	7	11	14
Walleye	10	15	20
Yellow Perch	5	8	10