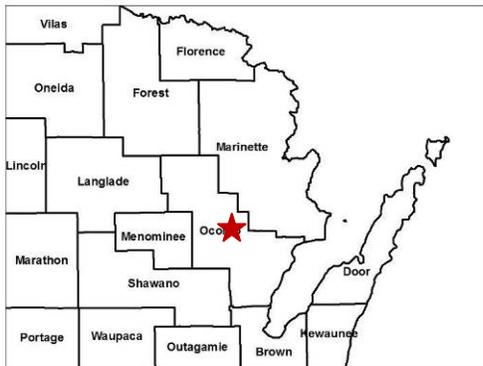
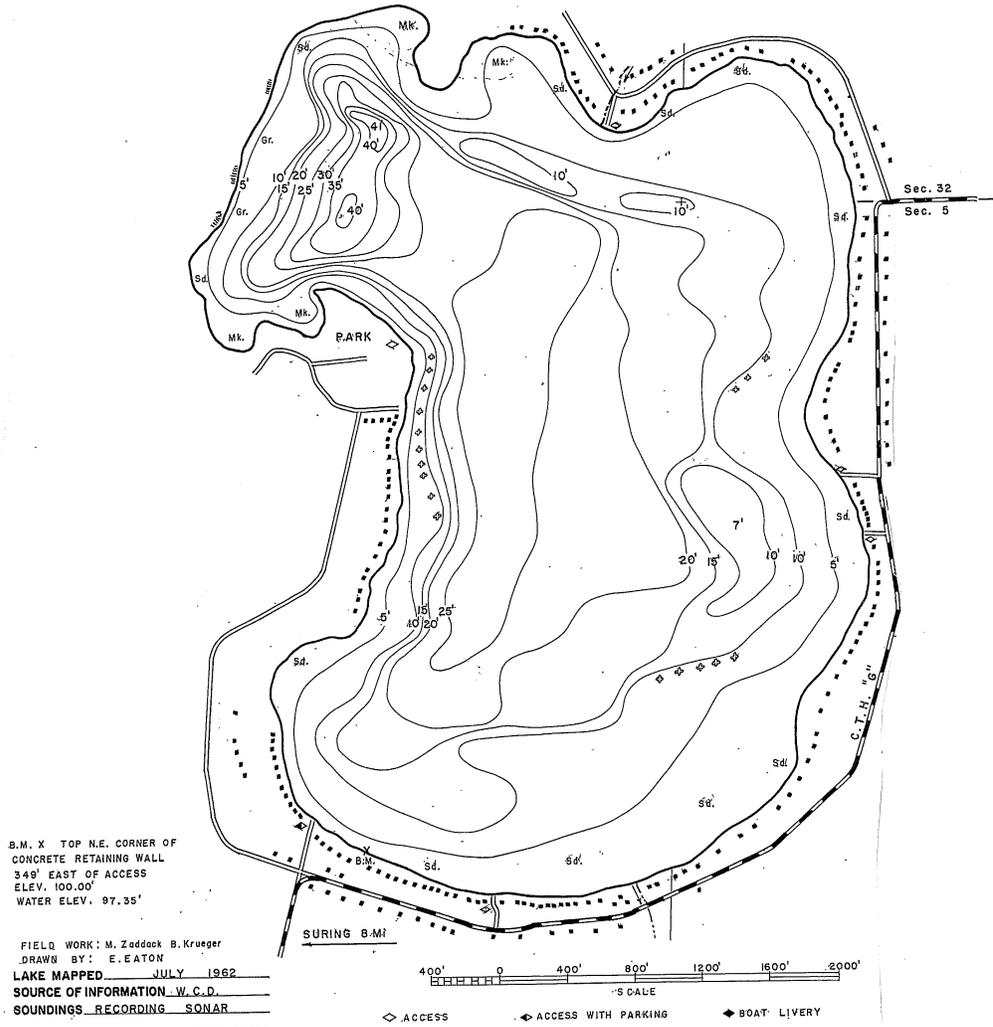


Kelly Lake, Oconto County Wisconsin Fisheries Survey Report, 2014

Waterbody Identification Code: 446600



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Wisconsin Department of Natural Resources
Peshtigo, Wisconsin
February 2015

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SUMMARY

Lake and location

Kelly Lake, Oconto County, T30N R19E Sections 31 and 32; T29N R19E Sections 5 and 6.
Located in the town of Brazeau and Spruce.

Physical / chemical attributes

Surface acres: 366
Maximum depth: 41 feet
Lake type: drainage
Water chemistry: Hard water, slightly alkaline, clear
Littoral substrate: primarily sand with limited muck, gravel, and rubble
Shoreline: 3.7 miles. Primarily developed upland (mixed hardwoods/conifers)
Aquatic vegetation: sparse; limited
Aquatic invasives: Eurasian water-milfoil

Purpose of surveys

Baseline lake survey Tier 1 assessment

Dates of fieldwork

Spring Fyke netting survey: April 29 through May 5, 2014
Summer Fyke netting survey: June 16 – 17, 2014
Electrofishing surveys: May 6, May 27, and September 24, 2014

Fishery

Largemouth bass, bluegill, rock bass, walleye, northern pike, yellow perch, warmouth, pumpkinseed, black crappie, white sucker, and bullhead (yellow and brown) are present.

Acknowledgements

Data collection for the 2014 survey was completed by WDNR fisheries staff Ronald Rhode, Brad Ryan, Tammie Paoli, Rod Lange, Kevin King, Steve Surendonk, and Steve Hogler. Fish aging and data entry was completed by Ronald Rhode.

SUMMARY

- Kelly Lake is a hard water drainage lake with an area of 366 acres and a maximum depth of 41 feet. The last comprehensive fyke netting survey was completed in 2001.
- Walleye small and large fingerlings have been stocked sporadically by the Wisconsin Department of Natural Resources and/or Kelly Lake Sportsman's Club since the 1970's.
- Yellow perch yearlings have been stocked regularly since 2003 by Kelly Lake Sportsman's Club.
- Overall, 1,176 fish representing 13 species were collected during the 2014 survey. The five most abundant species collected by number were largemouth bass (20% of total), bluegill (16%), rock bass (12%), bullhead spp. (11%), and walleye (10%).
- A total of 191 bluegill were collected. Bluegill ranged in length from 3.2 to 10.3 inches and averaged 6.1 inches. The number caught was considerably less than the 2001 survey, when 963 bluegill were captured.
- A total of 40 black crappie were sampled. The average length was 8.6 inches with a range from 5.2 to 11.7 inches. Growth rates in Kelly Lake are slightly better than other northeast Wisconsin lakes.
- A total of 81 yellow perch were sampled. The average length was 7.3 inches with a range from 5.3 to 11.3 inches.
- There were a total of 230 largemouth bass sampled, with an additional 5 fish that were recaptured. The population estimate was 1,818 fish, or 5/acre. Size structure is poor, with only 16% being of a legal size (14 inches or greater). Growth rates are slower than the 2001 survey and the northeast Wisconsin averages.
- The population estimate of northern pike was 145 fish (0.4/acre). A total of 75 northern pike were sampled, with an additional 12 recaptured fish. Average length was 18.7 inches with a range from 12.3 to 39.6 inches. The size structure was poor with only 17% of the fish greater than 21 inches.
- A total of 68 walleye were captured, plus an additional 45 fish were recaptured. The 2014 population estimate was 65 adult walleye, or 0.2/acre, and similar to the 2001 density of 0.3/acre. Average length was 19.7 inches with a range from 12 to 26 inches. Size structure was excellent, with 90% over 15 inches (legal size).

BACKGROUND

Kelly Lake is a hard water drainage lake with an area of 366 acres and a maximum depth of 41 feet. The littoral area is primarily sand with only limited muck, gravel, and rubble. There are five public boat landings (Figure 1). These access locations are owned and maintained by the Towns of Spruce and Brazeau. The majority of the 3.7 miles of shoreline is developed as homes and seasonal cottages. A total of 185 piers were counted on a recent aerial photo, averaging one dock every 105 feet of shoreline. On the west side of the lake, Holt Park (maintained by the Town of Spruce) has a campground and picnic area. The Kelly Lake Sportsmen's Club is a non-governmental group that is active in the lake community.

Aquatic invasive species present in Kelly Lake include Eurasian watermilfoil which was first documented in the lake in 2012. The Kelly Lake Advancement Association has received a state grant to implement control measures during 2014-2016. Habitat projects on the lake include the addition of brush shelters in the early 1960's. Additional fish cribs were installed between 1989 and the early 2000's. A walleye spawning reef was constructed in 1984 on the west shore, adjacent to Holt Park.

Current fishing regulations are listed in Table 1 and follow the general inland regulations. State and private fish stocking history for all species from 1972 to 2014 for Kelly Lake is summarized in Table 2.

Small and large fingerling walleye have been stocked sporadically by the Wisconsin Department of Natural Resources (WDNR) and the Kelly Lake Sportsmen's Club (KLSC) since the early 1970's. In anticipation of the 2014 comprehensive survey, walleye stocked in 2012 (large fingerlings; 2012 year class) and 2013 (yearlings; 2012 year class) were given a unique fin clip by WDNR and KLSC at the time of stocking (Table 2). The KLSC has stocked adult yellow perch in most years since 2003. As part of the Wisconsin Walleye Initiative, Kelly Lake was selected to receive 20 large fingerling walleye per acre (7,337 fish) beginning in 2014 and continuing for several years as funding allows.

Fisheries surveys conducted from 1984 to 2014 are shown in Table 3. The most recent comprehensive (netting and electrofishing) survey was conducted in 2001.

METHODS

Data collection

Eight standard 3' x 6' hoop fyke nets with ¾" bar, 1 ½" stretch mesh were set at ice-out on April 28, 2014. Nets were lifted daily from April 29 through May 5, 2014, for a total effort of 56 net nights (Figure 1). All fish captured were identified to species and measured to the nearest 0.1 inch. All gamefish were given a top caudal fin clip (for mark recapture population estimate), and a scale (northern pike) or dorsal spine (walleye, bass) was collected from 5 gamefish per 0.5 inch group per sex. Scales were collected from 5 panfish per 0.5 inch group per species with a length to the nearest 0.1 inch. An additional 250 lengths per species measured to the nearest 0.1 inch were collected as time allowed and all additional fish were counted.

Due to low numbers of panfish captured in the spring netting survey, an additional five fyke nets were set on June 16, 2014 and removed on June 17, 2014 (Figure 1). The primary purpose of the June survey was to collect aging structures and additional lengths on panfish during spawning.

A WDNR standard direct current double anode electrofishing boat was used to sample the entire shoreline on the evenings of May 6, May 27, and September 24, 2014. All panfish and gamefish were collected for the entire shoreline on May 6. On May 27, all panfish and gamefish were collected for two staggered 0.5 mile transects, and only gamefish were collected for the remaining shoreline per protocol (Spring Electrofishing II). Only walleye were collected on October 9 (Fall Electrofishing). Fish collected were measured to the nearest 0.1 inch and inspected for a top caudal fin clip. In the spring of 2013, an electrofishing survey targeting gamefish was completed.

Data analysis

Total catch and catch per gear type was calculated for all species (Tables 6 and 7). Ages were assigned to fish after scales and spines were aged using standard WDNR procedures. An age-length key was created to assign ages to un-aged fish based on proportional representation of the known age fish subsample, within the 0.5 inch length bins. The modified Schnabel population estimation technique was used for gamefish and was calculated using fish captured in fyke nets and the Spring Electrofishing I and II surveys in 2014.

Age and length frequency distributions and mean length at age analyses were performed for gamefish and panfish. Proportional stock density (PSD) and relative stock density of preferred length fish (RSD-preferred) were calculated (Anderson and Neumann 1996; Bister et al. 2000). Proportional stock density (PSD) is the ratio of 'quality-length' fish to 'stock-length' fish multiplied by 100. Relative stock density (RSD-preferred) is the ratio of 'preferred-length' fish to 'stock length fish' multiplied by 100. Both indices are commonly used as a measure of population size structure (Table 4). PSD and RSD data was combined for all gear types from all samples from 2014. Age-frequency distribution was calculated after ages were allocated to all fish in the sample, excluding recaptured fish. Mean length at age was calculated as mean length at time of capture. Mean lengths of aged fish were plotted against northeast Wisconsin averages and the 2001 survey, if aging data was available. Total mortality was estimated using a catch curve analysis (Ricker 1975) for populations where the assumptions of constant recruitment and mortality appeared valid.

RESULTS AND DISCUSSION

A total of 1,176 fish (including recaptures) of 13 different species were collected (Table 5). Catch per gear type are shown for each species sampled (Tables 6 and 7). Largemouth bass, bluegill, rock bass, walleye, northern pike, yellow perch, warmouth, pumpkinseed, black crappie, white sucker, and yellow and brown bullhead were common. Other species captured include bluegill hybrids and green sunfish.

Water temperature during the spring netting survey ranged from 40-46F. This was an unusually late spring, and northern pike, walleye, and yellow perch were spawning at the same time. In contrast, fyke nets in 2001 were lifted from April 15-23 and water temperature was 45F or greater during that survey.

Black Crappie

A total of 40 black crappie were sampled. The catch rate was 0.6 per net night during spring fyke netting and 1.6 per mile electrofishing (Tables 6 and 7). The average length was 8.6 inches with a range from 5.2 to 11.7 inches. Growth rates in Kelly Lake are slightly better than other northeast Wisconsin lakes. The length frequency distribution indicated a wide variety of lengths

(Figure 2), which corresponds with several year classes in the age distribution (Figure 3). 63% of fish were greater than 8 inches (PSD), which is close to the acceptable range of 30-60%, and 23% of the fish were greater than 10 inches (RSD-preferred). The mean length at age shows that these fish are growing slightly faster compared to other populations in northeast Wisconsin (Figure 4), and may be a result of low density of black crappie.

Bluegill

Bluegill were the most abundant panfish species captured, with a total of 191 sampled. The catch rate was 0.6/net night in the spring, 22.4/net night in June, and 27/mile for electrofishing (Tables 6 and 7). Catch rates for bluegill in 2014 were notably lower than the previous survey for all gear types (Tables 6 and 7). Average length was 6.1 inches with a range from 3.2 to 10.3 inches. 58% of the fish were greater than 6 inches (PSD), which is within the acceptable range of 20-60%. Also, 7% were greater than the “preferred” size of 8 inches (RSD-preferred), which is within the desirable range of 5-20% (see Table 4; Figure 5). There was good representation of ages 3 through 6 (Figure 6). The oldest bluegill, estimated at 8 years old, was 10.3 inches. Total annual mortality for ages 4-8 was estimated at 42%. The growth rate of bluegills is slightly above the northeast Wisconsin average (Figure 7).

Pumpkinseed Sunfish

There were a total of 44 pumpkinseed sampled. The catch rate was 7.4/net night and 6/mile electrofishing (Tables 6 and 7). Average length was 5.9 inches with a range from 3.6 to 8.7 inches. The size structure was fairly evenly distributed, with 55% of the fish 6 inches or greater (PSD) (Figure 8). Ages 3 and 4 dominated the catch (Figure 9). Growth rates are faster than Oconto County averages (Figure 10).

Rock Bass

A total of 141 rock bass were sampled, for a catch rate of 2.1/net night in the spring (Table 6). Average length was 6.8 inches with a range from 4.4 to 9.5 inches. The size structure was good, with 45% of the fish greater than 7 inches (PSD), which is within the acceptable range of 20-60% (Table 4; Figure 11). Age 4 and 5 dominated the catch (Figure 12). Because aging structures are not regularly collected on rock bass, length at age data for northeast Wisconsin is not readily available. However, growth rates in Kelly Lake are similar to Anderson Lake and faster than Chute Pond in Oconto County (Figure 13).

Yellow Perch

A total of 81 yellow perch were sampled. Average length was 7.3 inches with a range of 5.3 to 11.3 inches (Figure 14). Several year classes were represented (Figure 15). The size structure was skewed toward smaller fish, with only 20% of the fish greater than 8 inches (PSD). Growth rates are slightly below northeast Wisconsin averages for ages 4 through 6 (Figure 16). The Kelly Lake Sportsmen’s Club has been stocking between 1,000 to 5,000 yellow perch in most years since 2003 (Table 2).

Largemouth Bass

Largemouth bass were the most abundant of all fish species captured, with a total of 235 sampled including 5 recaptured individuals. The catch rate for summer fyke netting was 2.0/net night (Table 6). Catch rates (14.6/mile and 42.2/mile) for spring electrofishing surveys were high

(Table 7). The population estimate for largemouth bass was 1,818 fish (5 per acre), with a 95% confidence range between 861 and 4,158. This is a fairly high population density compared to other area lakes. Average length of largemouth bass was 11.9 inches with a range from 6.5 to 18.4 inches. The size structure was poor, with only 16% being 14 inches or greater (legal size) (Figure 17). There appears to be steady recruitment of largemouth bass, with several ages being represented (Figure 18). The total annual mortality for ages 7-11 is estimated at 36%, which is quite low and may reflect that some of those fish are not yet of a legal size to be harvested. Growth rates for largemouth bass are considerably slower compared to both the 2001 survey and northeast Wisconsin averages (Figure 19) and likely related to higher density of largemouth bass. It takes approximately 8 years for a largemouth bass to reach 14 inches in Kelly Lake.

Northern Pike

There were a total of 87 northern pike sampled, including 12 recaptured individuals. The catch rate during spring fyke netting was 1.4/net night (Table 6) compared to 1.0/net night in 2001. The population estimate for northern pike was 145 adults (0.4 per acre), with a 95% confidence range between 86 and 262. This is considered a fairly low density for northern pike. Average length was 18.7 inches with a range from 12.3 to 39.6 inches. The size structure was poor with only 17% of the fish greater than 21 inches (PSD), which is below the acceptable range of 30-60% (Figure 20; Table 4). However, this may be a result of the sex ratio in the sample which was dominated by males 10:1. This ratio is a common pattern and may suggest either an angler preference to harvest faster growing females or a gear bias towards netting males. The three largest fish in the sample were females. The age frequency distribution was dominated by age 3 fish (2011 year class) (Figure 21). The total annual mortality for ages 3-10 is estimated at 59%. Growth rates are slightly below the northeast Wisconsin averages (Figure 22).

Walleye

A total of 113 walleye were sampled, including 44 recaptured individuals. The catch rate during spring fyke netting was 1.9/net night (Table 6) compared to 1.8/net night in 2001. The population estimate for walleye was 65 adults (0.2 per acre), with a 95% confidence range between 49 and 89. This is considered a low population density for walleye, and is similar to the estimate obtained in the 2001 survey. At that time, 86 walleye were captured, for a population estimate of 111 or 0.3/acre (95 – 135, 95% confidence interval). Average length in 2014 was 19.7 inches with a range from 12 to 26 inches. The size structure was excellent with 90% of the fish being greater than 15 inches (PSD) (Figure 20; Table 4). The age frequency distribution was dominated by age 7 fish (2007 year class) (Figure 21). Growth rates are similar to northeast Wisconsin averages (Figure 22). Similar to the 2001 netting survey, the majority of the walleye in 2014 were caught in the net located on the spawning reef adjacent to Holt Park. Fall electroshocking surveys targeting small walleye only resulted in 3 fish, all in the 12-inch range with an RV clip indicating they were stocked in 2013. No unclipped small walleye were captured, suggesting that natural reproduction is negligible in Kelly Lake.

CONCLUSIONS AND RECOMMENDATIONS

Littoral fish habitat on Kelly Lake is limited. The shoreline is highly developed, with only a small amount of natural shoreline. The sand substrate dominating the littoral zone is not favorable for aquatic vegetation that would provide refuge for panfish. There is very little coarse

woody debris along the shoreline to provide fish habitat. The physical and chemical characteristics (clear, hard water) of the lake influence the overall fishery in the lake.

Spawning habitat for northern pike (shallow, vegetated, protected shorelines) is minimal, which may explain why the density of pike is low (0.4 adults/acre). Continuing to protect the limited areas where pike can reproduce is important. These areas include the bay adjacent to Holt Park, the small reach of natural shoreline on the southwest portion of the lake, and the bays on the northwest portion of the lake. Discouraging riparian property owners from mowing to the water's edge will allow native grasses and sedges to grow. Allowing a buffer of vegetation along the shoreline will filter runoff and fertilizer from lawns as well as provide habitat for frogs and aquatic insects which are important components of a healthy aquatic ecosystem.

Walleye in Kelly Lake exhibit average growth rates and good size structure. However, the current population density of 0.2/acre is very low. A minor recreational walleye fishery is provided through stocking. The rock reef that was constructed in 1984 provides marginal spawning habitat for walleye. During the spring netting survey, 60% of all walleye were captured in the net placed over the rock reef. It was apparent that walleye are attracted to this area. Upon further inspection, we noted that the reef consists of highly variable sized rocks, including some rocks that were too large (10 inches diameter or greater) to be utilized by walleye. In addition, there were several bare areas throughout the reef which had no rock. Improving the existing walleye reef may help to improve the walleye fishery in the future. Although Kelly Lake's physical and chemical characteristics will likely never support a self-sustaining walleye population, enhancing the existing walleye reef may result in some natural reproduction that could supplement stocking. The Kelly Lake Sportsmen's Club committed funds to add rock over the existing reef and that project was completed in February 2015.

Additional fish habitat could be gained by the placement of large woody debris ("fish sticks") along shorelines. In this highly developed lake, the addition of coarse woody debris in the near-shore zone may serve to increase growth rates of largemouth bass and increase recruitment of yellow perch (Sass et al. 2006) that require woody or vegetated structure to drape their egg skeins upon.

Population density of largemouth bass is high at 5.0/acre. Size structure is poor with only 16% of the largemouth bass sampled being 14 inches or greater. Management of Kelly Lake should focus on reducing the density and improving size structure of largemouth bass. I suggest a regulation change for largemouth bass from the existing regulation of 5/day, 14 inch minimum size to 5/day, no minimum size. The management goals are to reduce over-abundant smaller bass, improve bass growth, and increase bass average length. Increased harvest of small bass will hopefully thin the population and increase growth rates of bass.

The next comprehensive survey for Kelly Lake is scheduled for 2024.

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TABLES AND FIGURES

TABLE 1.— Current (2014) fishing regulations for Kelly Lake.

Species	Open Season	Daily limit	Minimum length
Largemouth and Smallmouth Bass	first Saturday in May – first Sunday in March	5	14 inches
Walleye	first Saturday in May – first Sunday in March	5	15 inches
Muskellunge	Saturday nearest Memorial Day to November 30 th .	1	40 inches
Northern Pike	first Saturday in May – first Sunday in March	5	none
Panfish (bluegill, pumpkinseed, yellow perch, black crappie)	Open all year	25 in total	none

TABLE 2.— Stocking history of Kelly Lake from 1972 to 2014 (continued on next page).

YEAR	SPECIES	STRAIN	AGE CLASS	NUMBER STOCKED	AVG LENGTH	CLIP	SOURCE
1972	WALLEYE	UNSPECIFIED	FINGERLING	6,620	3		DNR COOP PONDS
1974	WALLEYE	UNSPECIFIED	FINGERLING	30,000	3		DNR COOP PONDS
1978	WALLEYE	UNSPECIFIED	FINGERLING	7,000	4		DNR COOP PONDS
1989	WALLEYE	UNSPECIFIED	FINGERLING	1,800	6		FIELD TRANSFER
1991	WALLEYE	UNSPECIFIED	FINGERLING	2,000	7		PRIVATE HATCHERY
1992	WALLEYE	UNSPECIFIED	FINGERLING	8,323	3		DNR COOP PONDS
1994	WALLEYE	UNSPECIFIED	FINGERLING	16,303	4		DNR COOP PONDS
1995	WALLEYE	UNSPECIFIED	YEARLING	500	10		PRIVATE HATCHERY
1996	WALLEYE	UNSPECIFIED	FINGERLING	14,954	2		DNR HATCHERY
1996	WALLEYE	UNSPECIFIED	FINGERLING	515	8		PRIVATE HATCHERY
1997	WALLEYE	UNSPECIFIED	FINGERLING	16,000	3		DNR PONDS
1998	WALLEYE	UNSPECIFIED	SMALL FINGERLING	13,314	1		DNR HATCHERY
2000	WALLEYE	UNSPECIFIED	SMALL FINGERLING	16,000	2		DNR HATCHERY
2003	YELLOW PERCH	UNSPECIFIED	ADULT (BROODSTOCK)	2,745	8		PRIVATE HATCHERY

2004	WALLEYE	LAKE MICHIGAN	SMALL FINGERLING	15,983	1		DNR HATCHERY
2004	WALLEYE	UNSPECIFIED	UNKNOWN	1,300	6		PRIVATE HATCHERY
2004	YELLOW PERCH	UNSPECIFIED	UNKNOWN	1,458	6		PRIVATE HATCHERY
2005	WALLEYE	UNSPECIFIED	LARGE FINGERLING	893			PRIVATE HATCHERY
2005	YELLOW PERCH	UNSPECIFIED	ADULT	1,069	6		PRIVATE HATCHERY
2006	WALLEYE	LAKE MICHIGAN	SMALL FINGERLING	12,625	1		DNR HATCHERY
2006	WALLEYE	UNSPECIFIED	LARGE FINGERLING	1,786	6		PRIVATE HATCHERY
2006	YELLOW PERCH	UNSPECIFIED	ADULT	2,137	5		PRIVATE HATCHERY
2007	WALLEYE	UNSPECIFIED	LARGE FINGERLING	3,150	8		PRIVATE HATCHERY
2007	YELLOW PERCH	UNSPECIFIED	ADULT	3,450	7		PRIVATE HATCHERY
2008	WALLEYE	MISSISSIPPI HEADWATERS	SMALL FINGERLING	11,404	1		DNR HATCHERY
2008	WALLEYE	UNSPECIFIED	LARGE FINGERLING	2,300	7		PRIVATE HATCHERY
2009	WALLEYE	UNSPECIFIED	LARGE FINGERLING	3,650	7		PRIVATE HATCHERY
2011	WALLEYE	UNSPECIFIED	LARGE FINGERLING	1,027	7		PRIVATE HATCHERY
2011	YELLOW PERCH	UNSPECIFIED	LARGE FINGERLING	2,030	7		PRIVATE HATCHERY
2012	WALLEYE	UNSPECIFIED	LARGE FINGERLING	950	8	LV	PRIVATE HATCHERY
2012	YELLOW PERCH	UNSPECIFIED	LARGE FINGERLING	2,742	7		PRIVATE HATCHERY
2013	WALLEYE	UNSPECIFIED	YEARLING	1,450	9	RV	PRIVATE HATCHERY
2013	YELLOW PERCH	UNSPECIFIED	YEARLING	3,475	7		PRIVATE HATCHERY
2014	WALLEYE	LAKE MICHIGAN	LARGE FINGERLING	7,334	7		DNR HATCHERY
2014	YELLOW PERCH	UNSPECIFIED	YEARLING	5,000	7		PRIVATE HATCHERY

TABLE 3.— WDNR fisheries surveys completed on Kelly Lake from 1980 to 2014.

Date	Survey Type	Effort	Primary survey purpose
April 29-May 5, 2014	Fyke net	56 net nights	Gamefish population estimate & panfish assessment
May 6, 2014	Electrofishing	3.7 miles	Gamefish/panfish assessment (SEI)
May 27, 2014	Electrofishing	3.7 miles	Gamefish/panfish assessment (SEII)
June 16-17, 2014	Fyke net	5 net nights	Summer panfish assessment
September 24, 2014	Electrofishing	3.7 miles	Fall walleye index
May 13, 2013	Electrofishing	3.7 miles	Gamefish assessment (SEI)
April 15-23, 2001	Fyke net	80 net nights	Gamefish population estimate & panfish assessment
June 21-22, 2001	Fyke net	10 net nights	Summer panfish assessment
October 23, 2001	Electrofishing	3.7 miles	Gamefish/panfish assessment
April 10-16, 1987	Fyke net	57 net nights	Gamefish population estimate & panfish assessment
October 13, 1987	Electrofishing	3.7 miles	Gamefish assessment
October 1, 1985	Electrofishing	3.7 miles	Gamefish assessment
October 11, 1984	Electrofishing	3.7 miles	Gamefish/panfish assessment

TABLE 4.— Proposed length categories used to calculate Proportional stock density (PSD) and Relative stock density (RSD) for various fish species. Measurements are total lengths for each category in inches. Updated from Anderson and Neumann (1996) and Bister et al. (2000).

Species	PSD	RSD-P	Stock	Quality	Preferred	Memorable	Trophy
Black crappie			5	8	10	12	15
Bluegill	20 - 60	5 - 20*	3	6	8	10	12
Brown bullhead			5	8	11	14	17
Largemouth bass	40 - 70	10 - 40*	8	12	15	20	25
Muskellunge			20	30	38	42	50
Northern pike	30 - 60		14	21	28	34	44
Pumpkinseed			3	6	8	10	12
Rock bass	20 - 60		4	7	9	11	13
Walleye	30 - 60		10	15	20	25	30
Yellow perch			5	8	10	12	15
Yellow bullhead			4	7	9	11	14

*Range based on management strategy for balanced populations.

TABLE 5.— Total number, percent of total, average length, and length range of fish by species captured with all gear types in 2001 and 2014 in Kelly Lake. Numbers include recaptured individuals.

*COMMON NAME OF FISH	2001				2014			
	NUMBER	PERCENT	AVERAGE LENGTH	LENGTH RANGE (inches)	NUMBER	PERCENT	AVERAGE LENGTH	LENGTH RANGE (inches)
Black Crappie	22	1.1%	9.0	7.3 - 11.6	40	3.4%	8.6	5.2 - 11.7
Bluegill	963	49.4%	6.8	3.4 - 9.9	191	16.2%	6.1	3.2 - 10.3
Largemouth Bass	107	5.5%	11.1	5.4 - 21.3	235	20.0%	11.9	6.5 - 18.4
Northern Pike	107	5.5%	17.6	10.5 - 31.7	87	7.4%	18.7	12.3 - 39.6
Pumpkinseed	39	2.0%	6.0	3.8 - 8.1	44	3.7%	5.9	3.6 - 8.7
Rock Bass	92	4.7%	6.6	3.0 - 9.3	141	12.0%	6.8	4.4 - 9.5
Walleye	145	7.4%	21.6	15.3 - 31.5	113	9.6%	19.7	12.0 - 26.0
Yellow Perch	50	2.6%	7.8	4.6 - 10.3	81	6.9%	7.3	5.3 - 11.3
Warmouth	33	1.7%	4.9	4.0 - 6.6	49	4.2%	5.6	4.2 - 7.9
Bullhead Sp.	226	11.6%			129	11.0%		
White Sucker	166	8.5%			63	5.4%		
Smallmouth Bass	1	0.1%	16.1	16.1	0	0.0%		
Bluegill Hybrid	0	0.0%			2	0.2%	5.8	4.3 - 7.2
Green Sunfish	0	0.0%			1	0.1%	6.3	
Total	1,951	100.0%			1,176	100.0%		

TABLE 6.— Catch summary for spring and summer fyke netting in Kelly Lake in 2001 and 2014. Totals include recaptured individuals. See Methods for additional sampling details.

	2001 Spring Fyke Netting (80 net nights)		2014 Spring Fyke Netting (56 net nights)		2001 Summer Fyke Netting (10 net nights)		2014 Summer Fyke Netting (5 net nights)	
	Total Catch	Catch per net night	Total Catch	Catch per net night	Total Catch	Catch per net night	Total Catch	Catch per net night
	Black Crappie	20	0.3	34	0.6	2	0.2	0
Bluegill	182	2.3	35	0.6	707	70.7	112	22.4
Largemouth Bass	29	0.4	15	0.3	30	3.0	10	2.0
Smallmouth Bass	0	0.0	0	0.0	0	0.0	0	0.0
Northern Pike	83	1.0	79	1.4	2	0.2	0	0.0
Pumpkinseed	1	0.0	0	0.0	38	3.8	37	7.4
Rock Bass	61	0.8	118	2.1	25	2.5	4	0.8
Walleye	145	1.8	104	1.9	0	0.0	0	0.0
Yellow Perch	45	0.6	71	1.3	0	0.0	0	0.0
Warmouth	0	0.0	4	0.1	33	3.3	40	8.0
Bullhead Sp.	93	1.2	96	1.7	132	13.2	33	6.6
White Sucker	166	2.1	63	1.1	0	0.0	0	0.0

TABLE 7.— Catch summary for electrofishing surveys in Kelly Lake in 2001, 2013, and 2014. Totals include recaptured individuals. See Methods for additional sampling details.

	2001 Fall		2014 Fall		2013 Spring		2014 Spring		2014 Spring	
	Electrofishing ^a		Electrofishing ^b		Electrofishing ^c		Electrofishing ^d		Electrofishing ^e	
	23-Oct-2001		24-Sep-2014		13-May-2013		6-May-2014		27-May-2014	
	Total	Catch								
	Catch	per mile								
Black Crappie							6	1.6		
Bluegill	74	148.0					17	4.6	27	27.0
Largemouth Bass	48	13.0			95	25.7	54	14.6	156	42.2
Smallmouth Bass	1	0.3								
Northern Pike	22	5.9			3	0.8	6	1.6	2	0.5
Pumpkinseed							1	0.3	6	6.0
Rock Bass	6	12.0					13	3.5	6	6.0
Walleye			3	0.8	2	0.5	5	1.4	1	0.3
Yellow Perch	5	10.0					9	2.4	1	1.0
Warmouth							2	0.5	3	3.0

^aGamefish collected for entire 3.7 mile shoreline. Panfish also collected for one 1/2 mile station

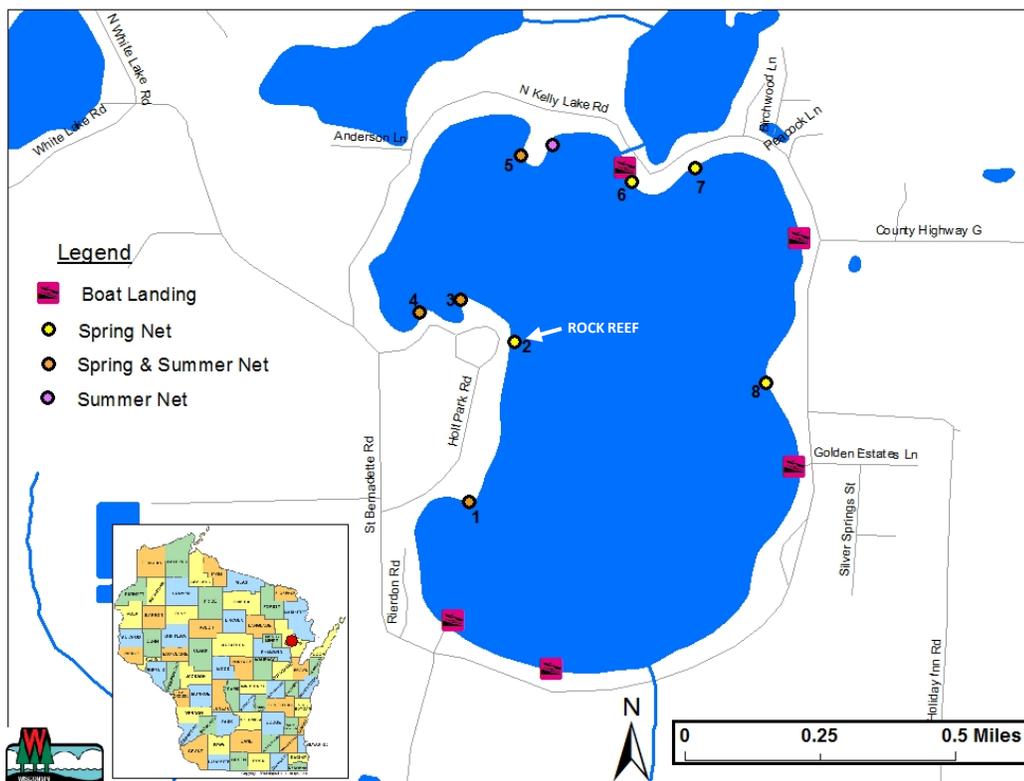
^bOnly walleye collected

^cOnly gamefish collected for entire 3.7 mile shoreline

^dAll panfish and gamefish collected for entire shoreline

^eGamefish collected for entire 3.7 mile shoreline. Panfish also collected for two 1/2 mile stations

FIGURE 1.— Locations of 8 fyke nets set on April 28 and removed on May 5, 2014 on Kelly Lake, Oconto County (effort = 56 net nights). Also, locations of summer fyke nets (June 16-17, 2014) are shown (effort = 5 net nights).



Date: 10/03/2014

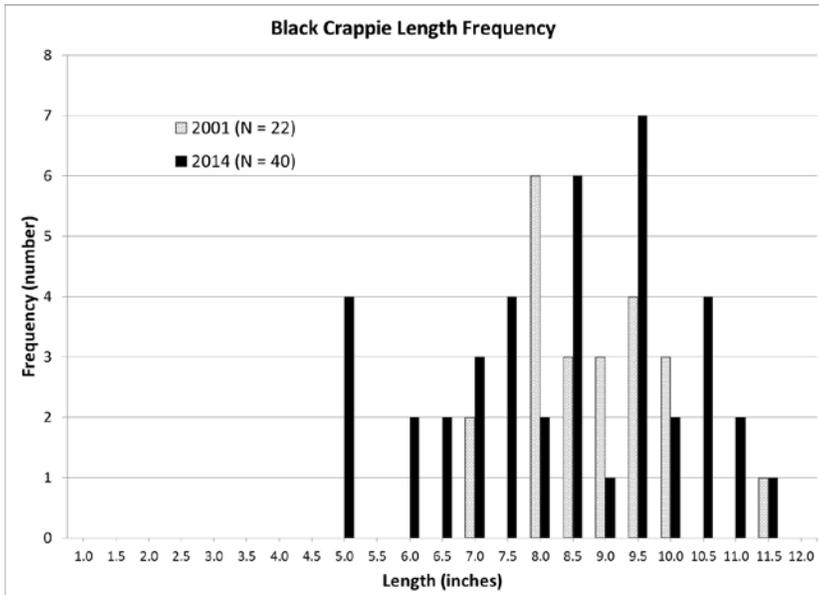


FIGURE 2. – Black crappie length frequency distribution from Kelly Lake, 2001 and 2014.

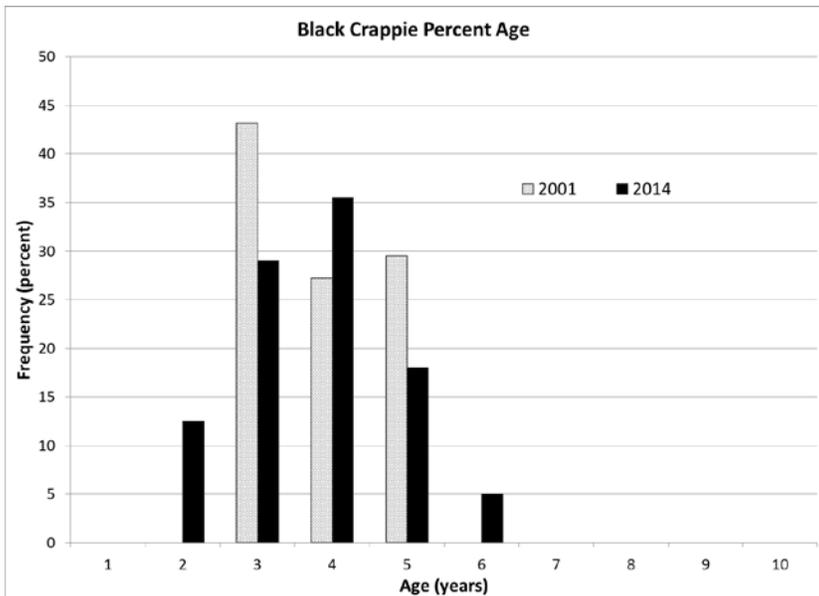


FIGURE 3. – Black crappie age frequency distribution from Kelly Lake, 2001 and 2014.

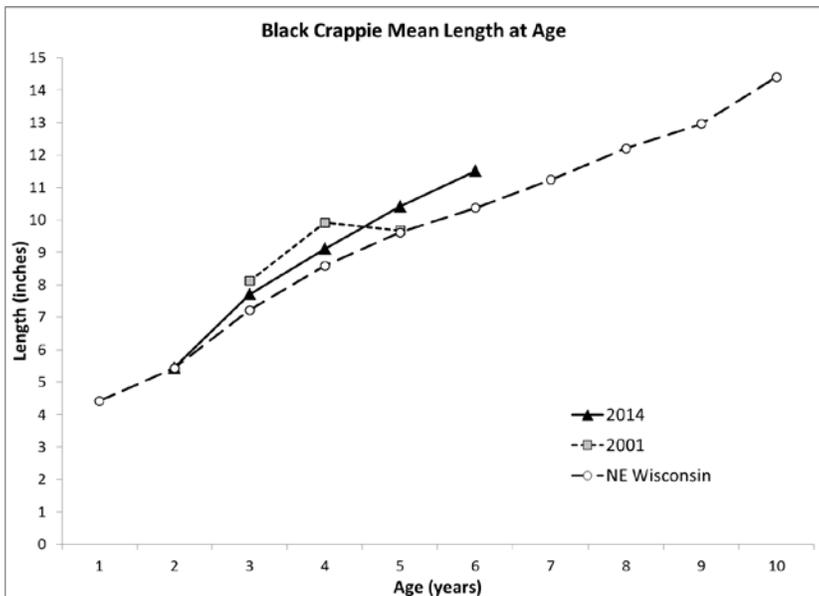


FIGURE 4. – Black crappie mean length at age, Kelly Lake, 2001 and 2014, compared to northeast Wisconsin averages.

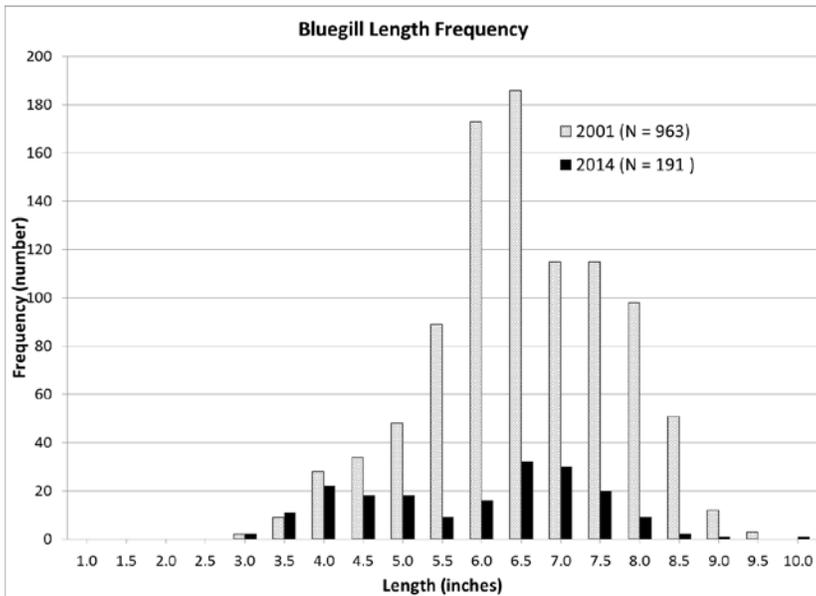


FIGURE 5. – Bluegill length frequency distribution from Kelly Lake, 2001 and 2014.

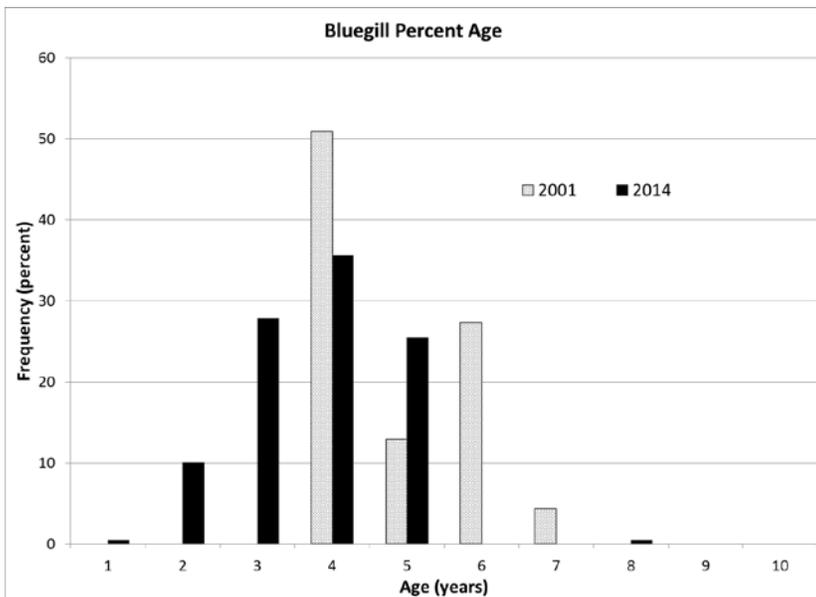


FIGURE 6. – Bluegill age frequency distribution from Kelly Lake, 2001 and 2014.

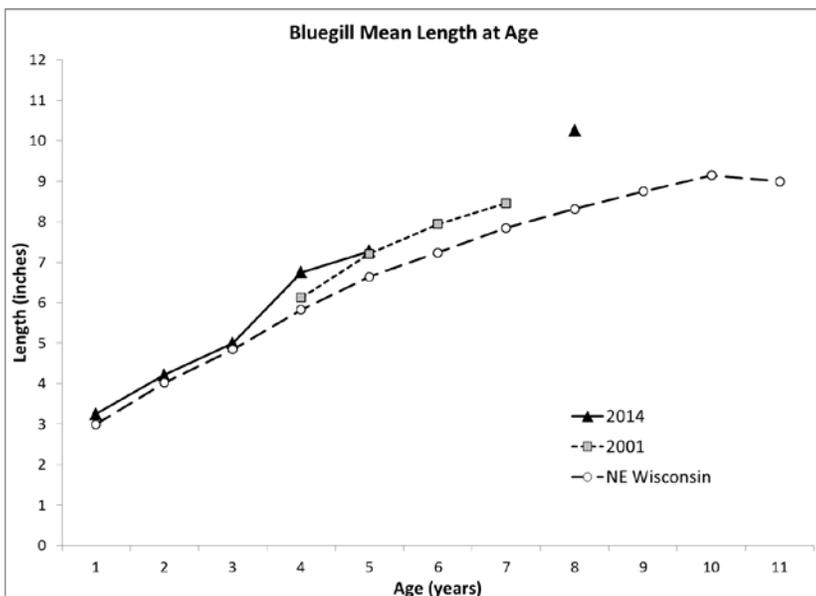


FIGURE 7. – Bluegill mean length at age, Kelly Lake, 2001 and 2014, compared to northeast Wisconsin averages.

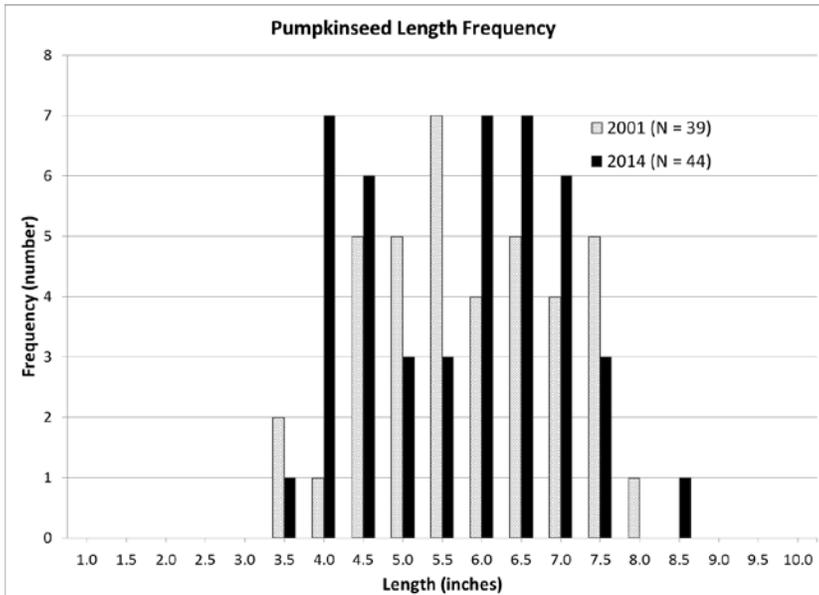


FIGURE 8. – Pumpkinseed length frequency distribution from Kelly Lake, 2001 and 2014.

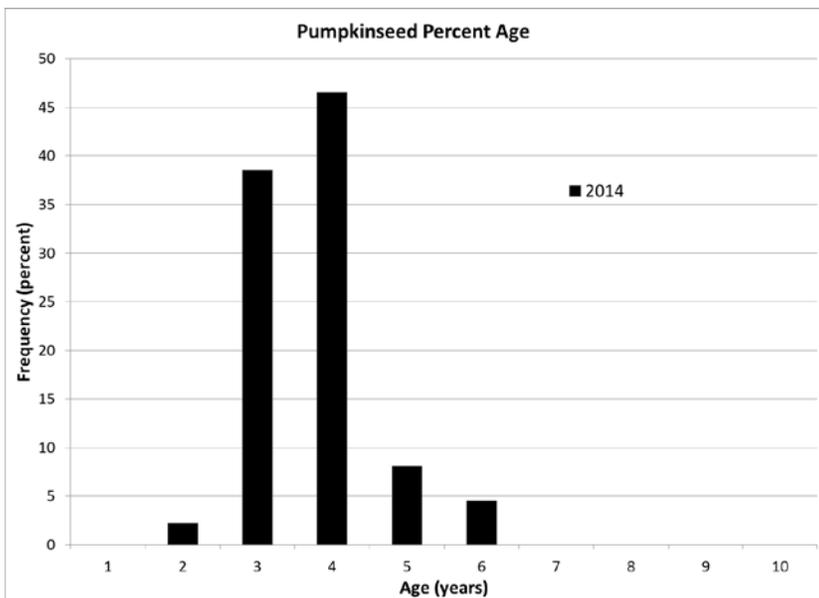


FIGURE 9. – Pumpkinseed age frequency distribution from Kelly Lake, 2014.

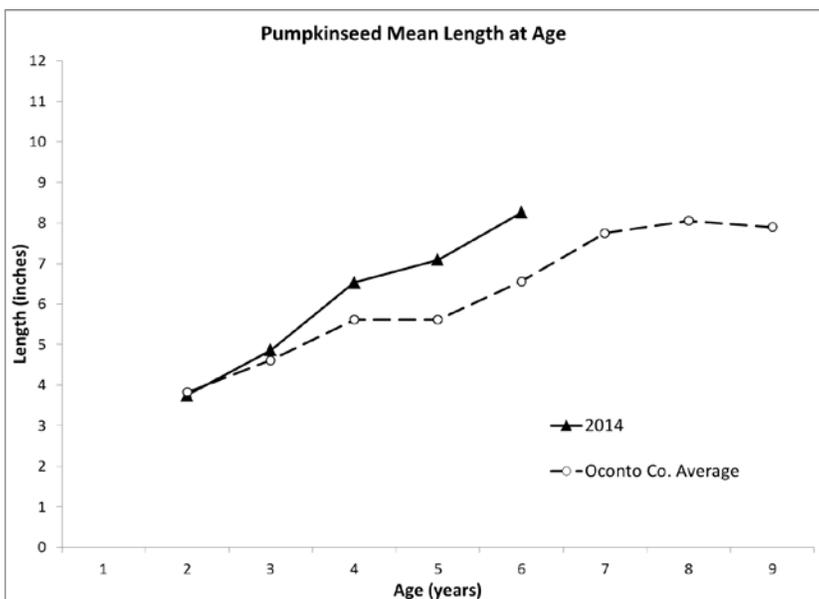


FIGURE 10. – Pumpkinseed mean length at age, Kelly Lake, 2014, compared to Oconto County averages.

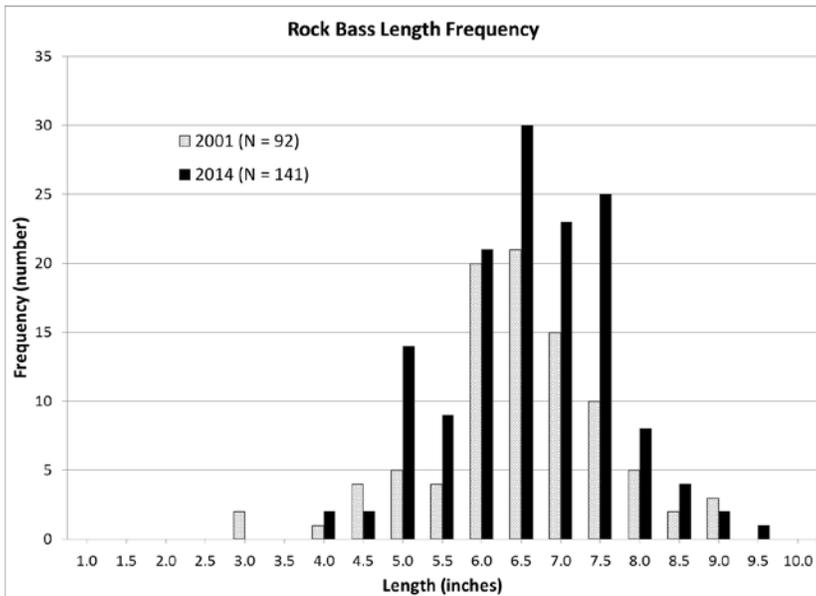


FIGURE 11. – Rock bass length frequency distribution from Kelly Lake, 2001 and 2014.

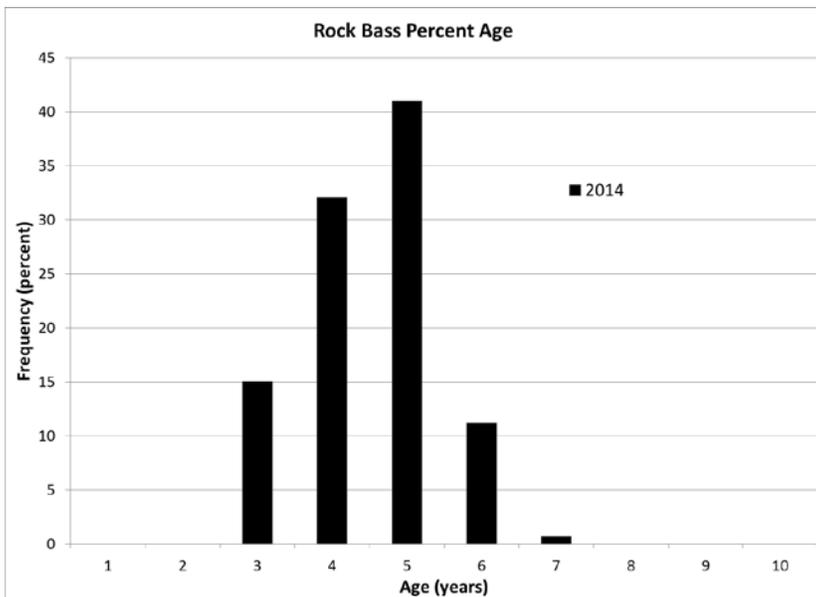


FIGURE 12. – Rock bass age frequency distribution from Kelly Lake, 2014.

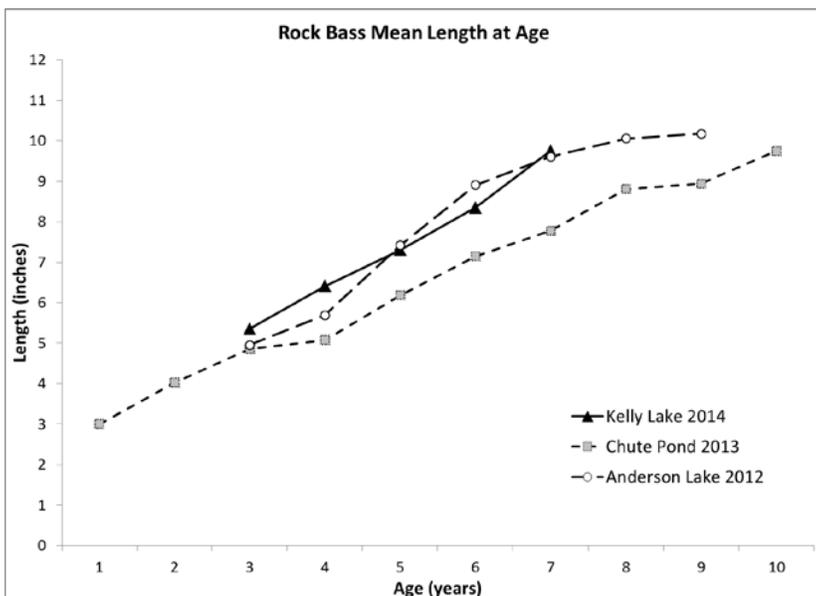


FIGURE 13. –Rock bass mean length at age, Kelly Lake, 2014, compared to 2012 Anderson Lake and 2013 Chute Pond (Oconto County) surveys.

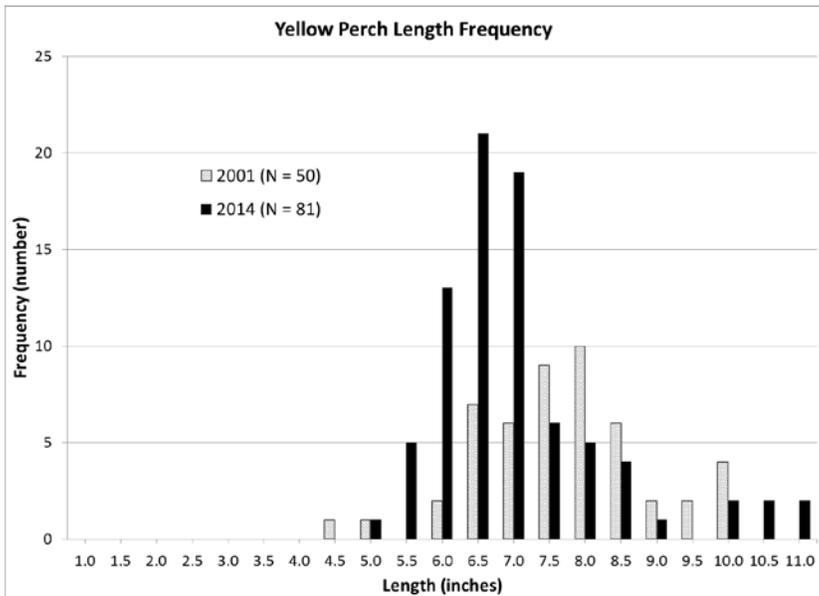


FIGURE 14. – Yellow perch length frequency distribution from Kelly Lake, 2001 and 2014.

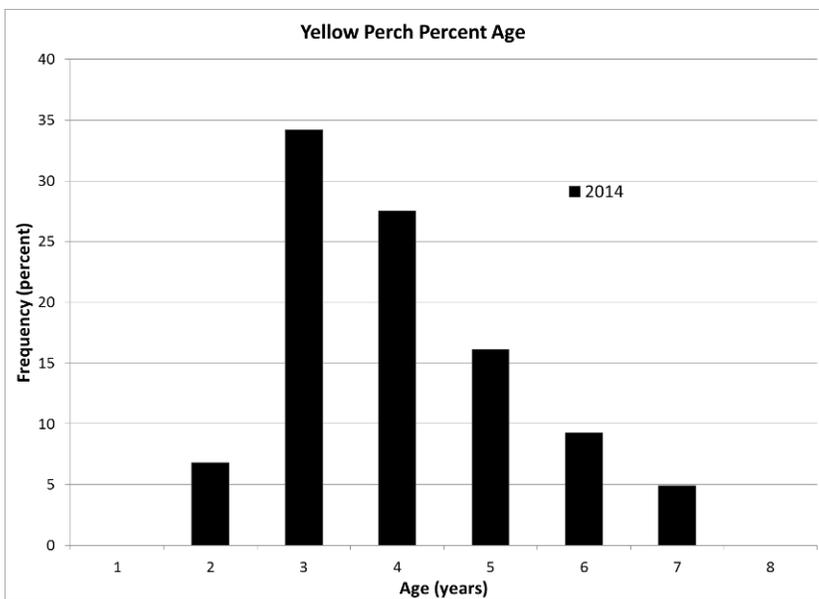


FIGURE 15. – Yellow perch age frequency distribution from Kelly Lake, 2014.

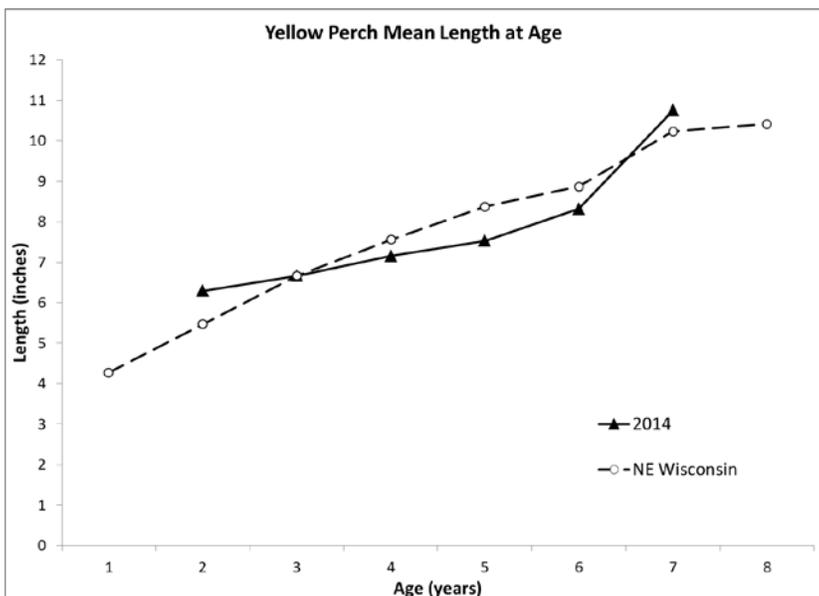


FIGURE 16. – Yellow perch mean length at age, Kelly Lake, 2014, compared to northeast Wisconsin averages.

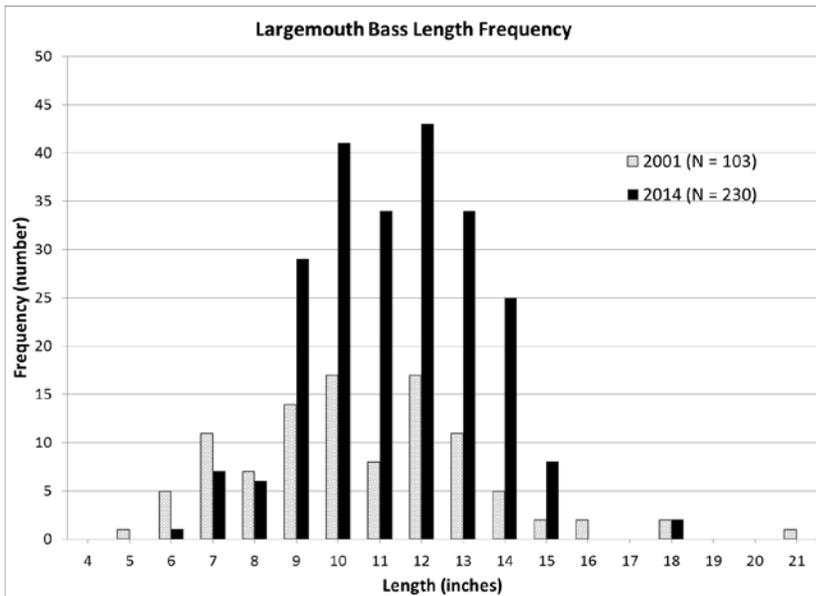


FIGURE 17. – Largemouth bass length frequency distribution from Kelly Lake, 2001 and 2014.

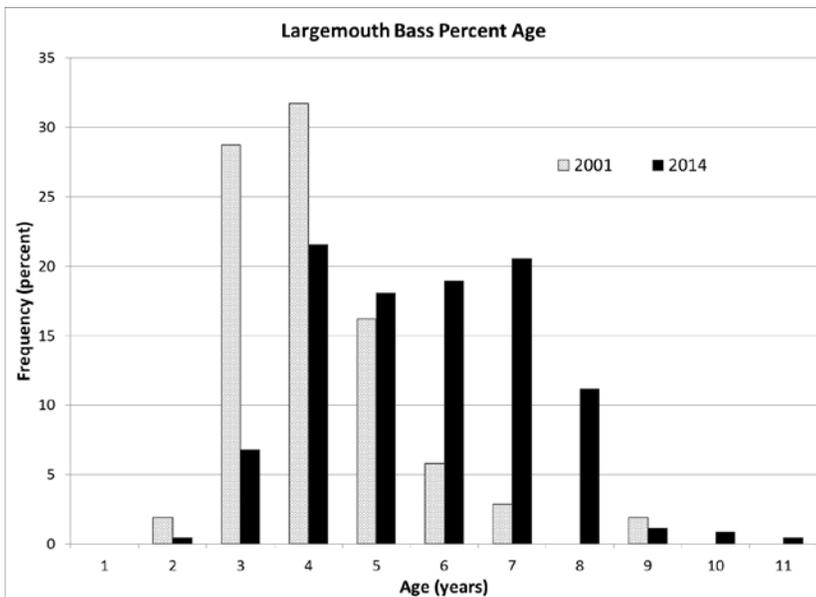


FIGURE 18. – Largemouth bass age frequency distribution from Kelly Lake, 2001 and 2014.

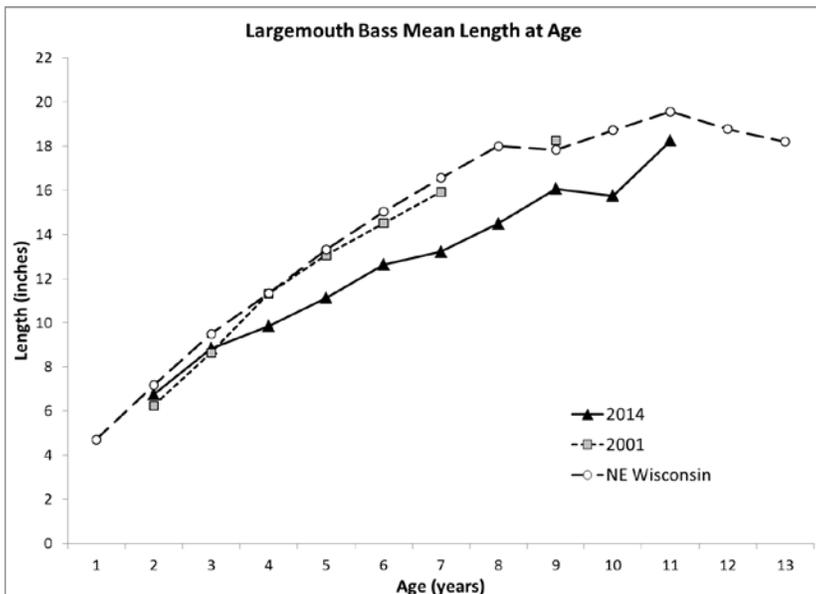


FIGURE 19. – Largemouth bass mean length at age, Kelly Lake, 2001 and 2014, compared to northeast Wisconsin averages.

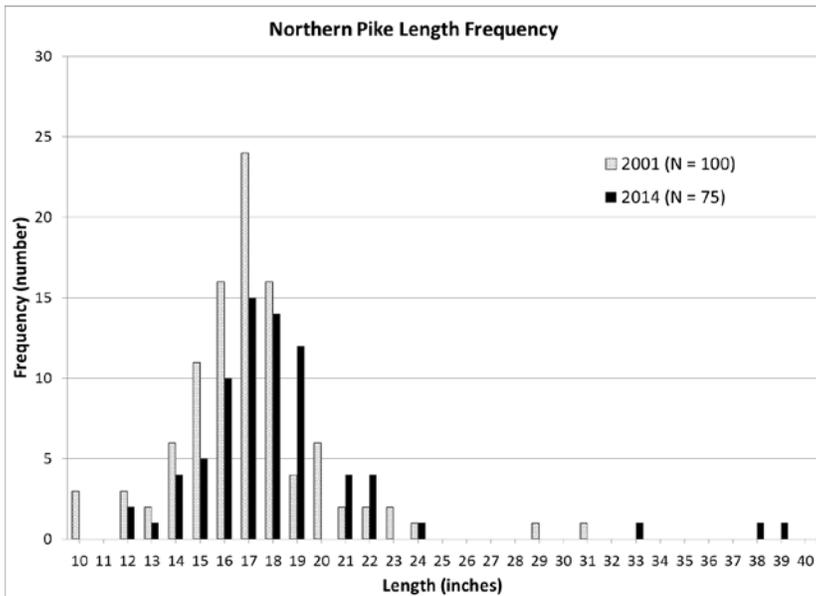


FIGURE 20. – Northern pike length frequency distribution from Kelly Lake, 2001 and 2014.

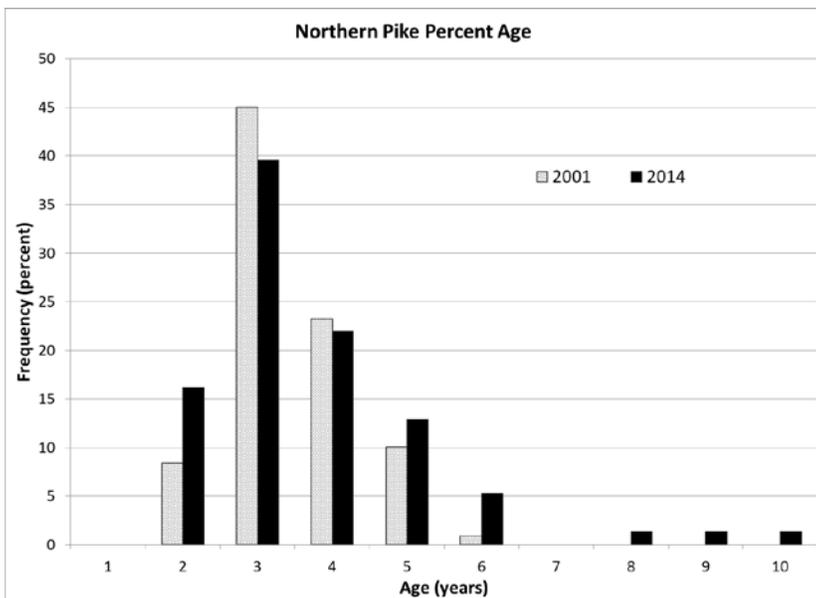


FIGURE 21. – Northern pike age frequency distribution from Kelly Lake, 2001 and 2014.

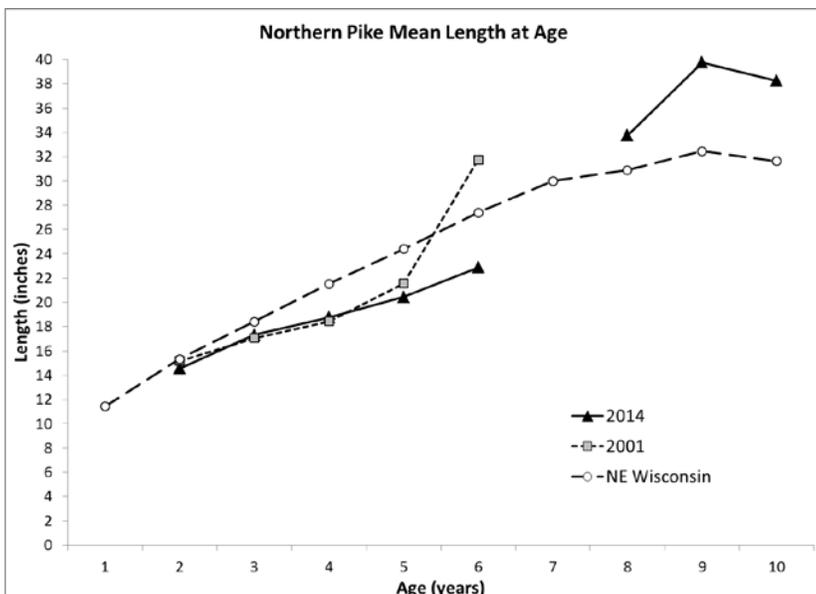


FIGURE 22. – Northern pike mean length at age, Kelly Lake, 2001 and 2014, compared to northeast Wisconsin averages.

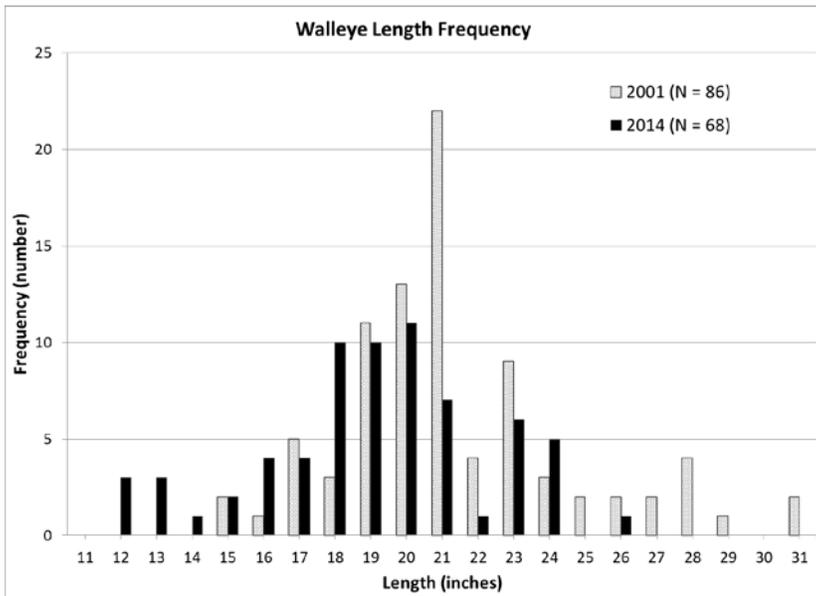


FIGURE 23. – Walleye length frequency distribution from Kelly Lake, 2001 and 2014.

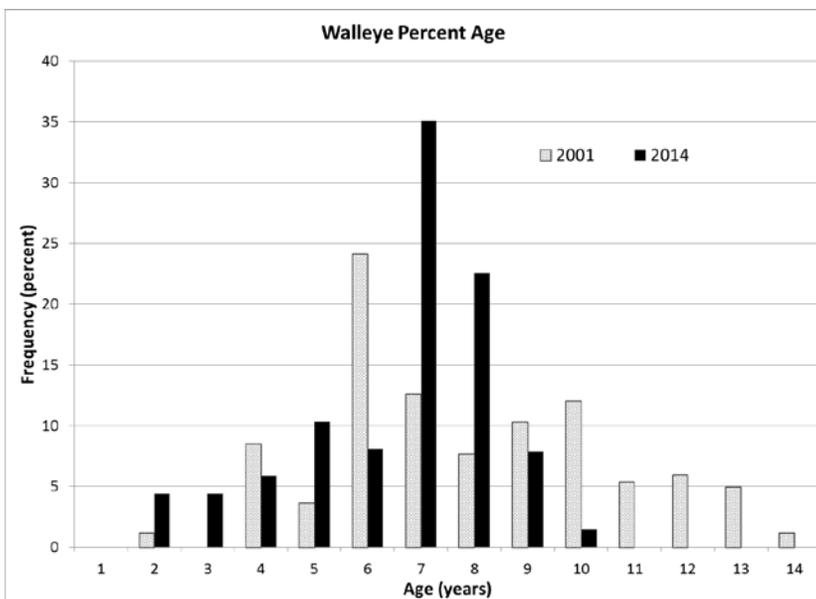


FIGURE 24. – Walleye age frequency distribution from Kelly Lake, 2001 and 2014.

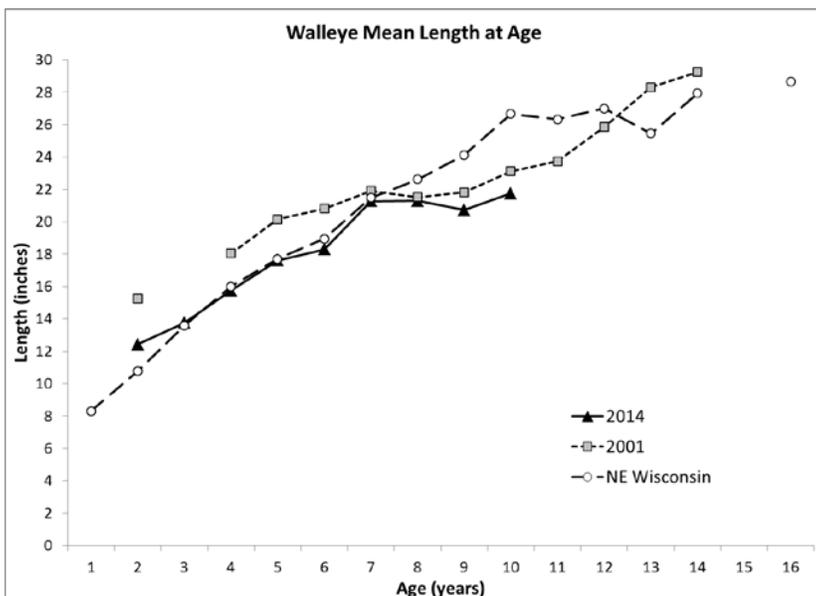


FIGURE 25. – Walleye mean length at age, Kelly Lake, 2001 and 2014, compared to northeast Wisconsin averages.

APPENDIX - PHOTOS



Buoy of net #3. Holt Park, Town of Brazeau, owns the shoreline in the background. This is one of a few areas of natural shoreline along Kelly Lake.



Net #7 set along a developed shoreline with no vegetated buffer on Kelly Lake.



Bottom substrate of the existing rock reef. Note that there are few smaller rocks, and a large area of no rock.

APPENDIX - PHOTOS



WDNR fish biologist Tammie Paoli holds a 39.6 inch female northern pike captured on April 29, 2014.



WDNR fish technicians Brad Ryan (left) and Ron Rhode (right) process fish on a cold spring day with snow flurries in the air on April 29, 2014.



A 13.5 inch walleye collected during a fall electroshocking survey on Kelly Lake. The fish has a left ventral (LV) clip, indicating that it was stocked in 2012 by the Kelly Lake Sportsmen's Club.

APPENDIX - PHOTOS



Bluegill collected during the June 2014 fyke netting survey on Kelly Lake.



Warmouth collected during the June 2014 fyke netting survey on Kelly Lake.