HILBERT LAKE

Marinette County
2021 Fish Management Report

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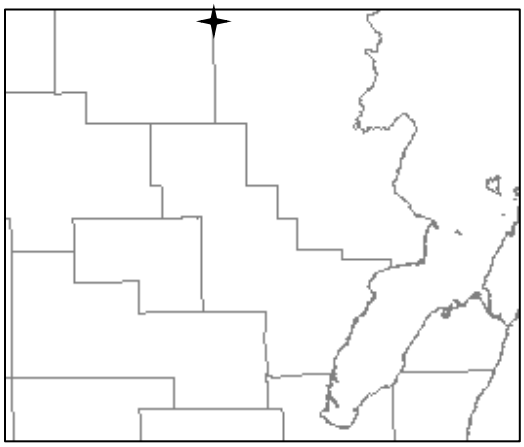

Wisconsin Department of Natural Resources
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WISCONSIN
DEPT. OF NATURAL RESOURCES

SPORT FISH RESTORATION

SUMMARY

Lake and location:
Hilbert Lake, Marinette County, T37N R17E Sec 6

Physical / chemical attributes (Wisconsin DNR, 1975):
Surface acres: 289
Maximum depth (ft): 38
Average depth (ft): 12
Shoreline length (mi): 4.6
Lake type: Seepage
Basic water chemistry: hard water, slightly alkaline, stained water of moderate transparency.
Littoral substrate: 60% sand, 15% muck, 15% gravel, and 10% rock.
Aquatic vegetation: Moderate amount of submergent vegetation is found in many areas of the lake.
Other features: The lake is comprised of three distinct basins. Approximately 10% of the western basin is in Forest County.

Purpose of survey:
Determine the status of fishery.

Surveys:

Survey Seq No	Survey Begin Date	Survey End Date	Primary Survey Purpose
515094646	3/31/2021	4/7/2021	FISHERIES ASSESSMENTS LAKES EARLY SPRING WAE MUE
515094797	6/1/2021	6/1/2021	FISHERIES ASSESSMENTS LAKES LATE SPRING BASS PAN
515095709	9/7/2021	9/7/2021	FISHERIES ASSESSMENTS LAKES FALL JUVENILE

Fishery:

The Hilbert Lake fishery is comprised of panfish species (Bluegill, Yellow Perch, Black Crappie, Pumpkinseed, and Rock Bass) and gamefish species (Walleye, Largemouth Bass, Smallmouth Bass, and Northern Pike).

EXECUTIVE SUMMARY

- At 289 acres, the lake offers a variety of recreational opportunities in addition to fishing. Goodman Park offers visitors, a beach, playground, excellent shore fishing access and a boat launch.
- Overall, 1,435 fish representing 12 species and were collected during the 2021 sampling season (Table 2). The five most abundant species collected by number were Bluegill *Lepomis macrochirus* (38%), Walleye*Sander vitreus* (16%), Largemouth Bass *Micropterus salmoides* (13%), Black Crappie *Pomoxis nigromaculatus* (10%) and Northern Pike *Esox lucius* (9%).
- A total of 550 **Bluegill** was collected which accounted for 38% of the fish collected. Bluegill ranged in length from 2.0 to 10.5 inches and averaged 5.3 inches. Forty percent of all Bluegill collected during SE2 electrofishing were 6 in or greater. Thirty-six percent of the Bluegill aged were 5 years old and averaged 6.5 inches.
- **Walleye** made up 16% of the total catch with 232 fish collected. Walleye ranged in length from 11.5 to 26.0 inches and averaged 18.9 inches across all samples. Spring fyke netting CPUE declined slightly from 5.6 in 2005 to 4.3 in 2021. No young-of-the year Walleye were collected during that survey which suggests there is no natural reproduction. Walleye ranged in age from 2 to 16 years old. Walleye were reaching legal size (18 inches) at age 4. Strong year classes of 4- and 6-year-old Walleye were present and made up over 75% of the fish aged. These year classes also correspond to Walleye stockings in 2015 and 2017. Walleye growth was above average until age 6 and average at older ages. The 2021 population estimate for adult Walleye was 289 or 1.0 adult/acre. This was less that what was observed in 2005 when the population estimate was 386 or 1.3 adults/acre.
- **Largemouth Bass** were the third most abundant species collected during the 2021 survey. Overall, 187 Largemouth were collected that ranged in length from 3.0 to 19.5 inches and averaged 12.1 inches. Electrofishing CPUE increased substantially between 2013 and 2021 from 12.9/mile to 23.1/mile. PSD declined slightly from 78 to 71 between 2013 and 2021. However, RSD^{P} improved significantly from 5 to 22 between surveys. A subsample of 111 Largemouth Bass was aged using scales (<12”) and dorsal spines (>12”). Ages ranged from 1 to 13 years old (Figure 6). Bass growth was average at all ages and were reaching 14 inches between age 5 and 6.
- A total of 138 **Black Crappie** was collected during the survey (127 – spring fyke netting; 11 – SE2 electrofishing). Crappie ranged in length from 3.5 to 14.0 inches and averaged 7.7 inches. A subsample of 74 Black Crappie was aged and ranged from 2 to 12 years old. Several good year classes were present, which is indicative of the cyclic spawning nature of Crappie, but none corresponded to previous stocking events. Thirty-one percent of the Crappie aged were 5 years old and averaged 9.0 inches.
- **Northern Pike** accounted for 9% of the fish collected. Pike ranged in length from 9.2 to 33.4 inches and averaged 21.6 inches. In 2021, fyke netting CPUE was 1.8/NN but declined from 2005 when CPUE was 4.6/NN. A subsample of 76 pike was aged using anal fin rays. Pike were aged from 2 to 11 years old.

- In 2005, **Rock Bass** were the most abundant species collected. By 2021, Rock Bass abundance declined significantly whereby fyke netting CPUE decreased from 12.6/NN in 2005 to 1.6/NN in 2021. Rock Bass averaged 6.9 inches and ranged in length from 4.0 to 10.0 inches.
- **Yellow Perch** abundance remains low despite a continued stocking effort by the Hilbert Lake Association. Fyke netting CPUE was 0.4/NN in 2005 and 0.3/NN in 2021. Only 18 perch were collected during each spring fyke netting survey in 2005 and 2021.
- Overall, 23 **Smallmouth Bass** were collected that ranged in length from 6.5 to 16.0 inches and averaged 13.3 inches. Electrofishing CPUE was 3.0/mile in 2013 and 3.3/mile in 2021 and essentially unchanged between surveys. A subsample of 22 Smallmouth Bass was aged using scales (<12") and dorsal spines (>12"). Smallmouth Bass growth was average at all ages and were reaching 14 inches between age 5.
- Panfish abundance, namely Bluegill and Crappie, improved between 2013 and 2021. Both species were stocked several times between surveys, but increased water levels likely had a greater influence on abundance than stocking.
- Adult density did not improve between 2005 and 2021. In 2005, the population estimate for adult Walleye was 386 or 1.3/acre but declined to 289 or 1.0 adult/acre in 2021. Increasing the stocking rate of large fingerling Walleye to 10/acre in alternate years or 5/acre annually would likely improve adult density over time.
- Largemouth Bass electrofishing CPUE almost doubled between 2013 and 2021 from 12.9/mile to 23.1/mile. The increase in Bass CPUE between years was likely influenced by increased water levels.
- Despite the lower fyke netting CPUE for Northern Pike, pike abundance and size structure remain similar to what was observed in previous surveys. Pike reproduction and recruitment were good. Several younger year classes (ages 1-5) will continue to provide anglers a respectable Northern Pike fishing opportunity for years to come.
- In 2021, the Hilbert Lake Association constructed 15 fish cribs that were placed throughout the lake (9 during the winter and 6 in the fall). The construction and placement of additional fish cribs is planned for the next several years. The Hilbert Lake Association has also expressed interest in developing additional fish habitat projects such as a Walleye spawning reef or "fish sticks".
- The current fishing regulations are adequate to provide quality fishing opportunities for a variety of species. The next comprehensive fisheries survey (spring fyke netting, electrofishing {spring, summer, fall}) of Hilbert Lake is scheduled for 2029.

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INTRODUCTION

Most of Hilbert Lake is in northwest Marinette County but about 10% of the lake lies in Forest County. At 289 acres, the lake offers a variety of recreational opportunities in addition to fishing. Goodman Park offers visitors, a beach, playground, excellent shore fishing access and a boat launch.

Hilbert Lake is located within the Ceded Territory (22,400 square miles of northern Wisconsin that was ceded to the United States by the Lake Superior Chippewa Tribes in 1837 and 1842) and therefore eligible for tribal, off-reservation spearing harvest. No fish were harvested during the 2021 season.

The Wisconsin Department of Natural Resources (WDNR) stocked small fingerling Walleye *Sander vitreus* every other year at various rates (fish/acre) beginning in the mid 1990's (Table 1). he Hilbert Lake Association also stocked large fingerling Walleye periodically. By 2013 the Wisconsin Walleye Initiative allowed for the stocking of large fingerling walleye in alternate years at the rate of 5/acre.

Table 1. Hilbert Lake Walleye stocking history; Marinette County, WI.

Year	Age Class	Number Stocked	Average Length (inches)	Source
1992	FINGERLING	1000	5.0	PRIVATE HATCHERY
1992	FINGERLING	633	5.0	DNR HATCHERY
1994	FINGERLING	1500	6.0	PRIVATE HATCHERY
1995	FINGERLING	775	6.0	PRIVATE HATCHERY
1996	FINGERLING	940	4.5	DNR HATCHERY
1997	LARGE FINGERLING	1054	3.2	DNR HATCHERY
1998	SMALL FINGERLING	14000	1.5	DNR HATCHERY
2001	SMALL FINGERLING	4800	1.5	DNR HATCHERY
2001	SMALL FINGERLING	4800	1.5	DNR HATCHERY
2003	SMALL FINGERLING	9996	1.3	DNR HATCHERY
2003	LARGE FINGERLING	280	7.5	DNR HATCHERY
2005	SMALL FINGERLING	14400	1.4	DNR HATCHERY
2005	LARGE FINGERLING	250	7.0	PRIVATE HATCHERY
2006	LARGE FINGERLING	1161	7.3	PRIVATE HATCHERY
2007	LARGE FINGERLING	475	6.9	PRIVATE HATCHERY
2009	LARGE FINGERLING	300	7.0	PRIVATE HATCHERY
2009	SMALL FINGERLING	9717	1.8	DNR HATCHERY
2010	LARGE FINGERLING	500	7.0	PRIVATE HATCHERY
2011	SMALL FINGERLING	11650	1.8	DNR HATCHERY
2012	LARGE FINGERLING	1000	8.0	PRIVATE HATCHERY
2013	LARGE FINGERLING	1444	7.6	DNR HATCHERY
2015	LARGE FINGERLING	1388	7.7	DNR HATCHERY
2017	LARGE FINGERLING	1391	3.7	DNR HATCHERY
2019	LARGE FINGERLING	1391	7.0	DNR HATCHERY
2021	LARGE FINGERLING	1390	7.2	DNR HATCHERY

Walleye fishing regulations have recently changed on Hilbert Lake. The previous regulation consisted of a 15-inch minimum length limit (MLL) and the daily bag limit fluctuated based on tribal harvest declarations. The new MLL is 18 inches, and the daily bag limit is 3.

Previous fish surveys of Hilbert Lake were conducted in 2005 and 2013. The 2005 survey consisted of spring fyke netting and spring (SE1) gamefish electrofishing while the 2013 survey focused on late spring (SE2) gamefish and panfish electrofishing. Both surveys indicated healthy populations of panfish and gamefish.

The goal of the 2021 comprehensive fisheries survey was to assess the status of the fishery by characterizing gamefish populations based on relative abundance, proportional stock density (PSD), relative stock density (RSD), catch per unit effort (CPUE) and mean length at capture (age). Sampling in 2021 consisted of spring fyke netting, spring electrofishing (SE1 and SE2) and fall electrofishing. Due to the variability of sampling completed in 2005 and 2013, complete comparisons between these surveys and 2021 is not possible but will be made where possible.

METHODS

DATA COLLECTION

Standard fyke nets (spring & summer; 3-foot hoop, $^3/_4$-bar, 1.5-inch stretch), mini-fyke nets ($^1/_4$-inch stretch with turtle exclusion) and a standard WDNR electrofishing boat (spring/SE1, summer/SE2, fall) were used to collect fish on Hilbert Lake. All fish collected were measured to the nearest 0.1-inch (in) total length (TL). A sub-sample of scales, dorsal spines, or anal fin rays was collected for age and growth analysis from all gamefish. Aging structures were collected from 5 fish per half inch group. If sex could be determined, structures from 5 fish per sex were collected per half inch group. Ages were assigned to each fish using standard WDNR procedures.

DATA ANALYSIS

Catch per unit effort (CPUE) was calculated as catch by gear divided by sampling effort for each species collected. Length frequency distributions were tabulated from fish measured during the electrofishing and fyke net samples; not all panfish were measured. Proportional stock density (PSD) and relative stock density for preferred length fish (RSD^P) were calculated for dominant gamefish (Anderson and Neumann 1996). Preferred lengths of various gamefish have a minimum length between 45 and 55% of the world record length for that species (Anderson and Neumann 1996). Stock, quality, and preferred lengths were used as proposed by Gabelhouse (1984). Mean length at capture data was calculated for dominant

gamefish and compared to the average of mean length at age for northern Wisconsin.

RESULTS & DISCUSSION

Overall, 1,435 fish representing 12 species and were collected during the 2021 sampling season (Table 2). The five most abundant species collected by number were Bluegill *Lepomis macrochirus* (38%), Walleye *Sander vitreus* (16%), Largemouth Bass *Micropterus salmoides* (13%), Black Crappie *Pomoxis nigromaculatus* (10%) and Northern Pike *Esox lucius* (9%).

Table 2. Species composition of fishes collected during the 2021 comprehensive survey of Hilbert Lake, Marinette County, WI.

2021							
SPECIES COMPOSITION OF FISHES COLLECTED							
***COMMON NAME**	**TOTAL NUMBER COLLECTED**	**PERCENT**	**NUMBER COLLECTED (FN)**	**NUMBER COLLECTED (Spring - EF)**	**NUMBER COLLECTED (Summer - EF)**	**AVERAGE LENGTH (inches)**	**LENGTH RANGE (inches)**
Bluegill	550	38%	384		166	5.3	2.0-10.5
Walleye**	232	16%	201	27	4	18.9	11.5-29.0
Largemouth bass	187	13%	25		162	12.1	3.0-19.5
Black crappie	138	10%	127		11	7.7	3.5-14.0
Northern pike	123	9%	113		10	21.6	9.2-33.4
Rock bass	110	8%	98		12	6.9	4.0-10.0
Pumpkinseed	35	2%	23		12	6.3	3.5-8.5
Yellow perch	25	2%	18		7	6.2	4.0-9.0
Smallmouth bass	23	2%			23	13.3	6.5-16.0
White sucker	8	1%	8			-	-
Black bullhead	3	< 1%	3			12.8	11.9-13.5
Brown bullhead	1	< 1%			1	-	13.7
TOTALS	**1,435**		**1,000**	**27**	**408**		
* Common names of fishes recognized by the American Fisheries Society.							
** Recapures not included							

A total of 550 Bluegill was collected which accounted for 38% of the fish collected. Bluegill ranged in length from 2.0 to 10.5 inches and averaged 5.3 inches (Figure 1). Forty percent of all Bluegill collected during SE2 electrofishing were 6 in or greater and considered harvestable. Electrofishing (EF) CPUE increased from 19 to 111 Bluegill/mile (mi) between 2013 and 2021. Bluegill PSD from the electrofishing sample increased from 36 to 44 between 2013 and 2021. However, RSD^P declined from 25 to 11 but is within the desirable range of 5 to 20. This decline in RSD^P was likely due to a smaller sample size between years rather an indication of a change in Bluegill size structure (Figure 1).

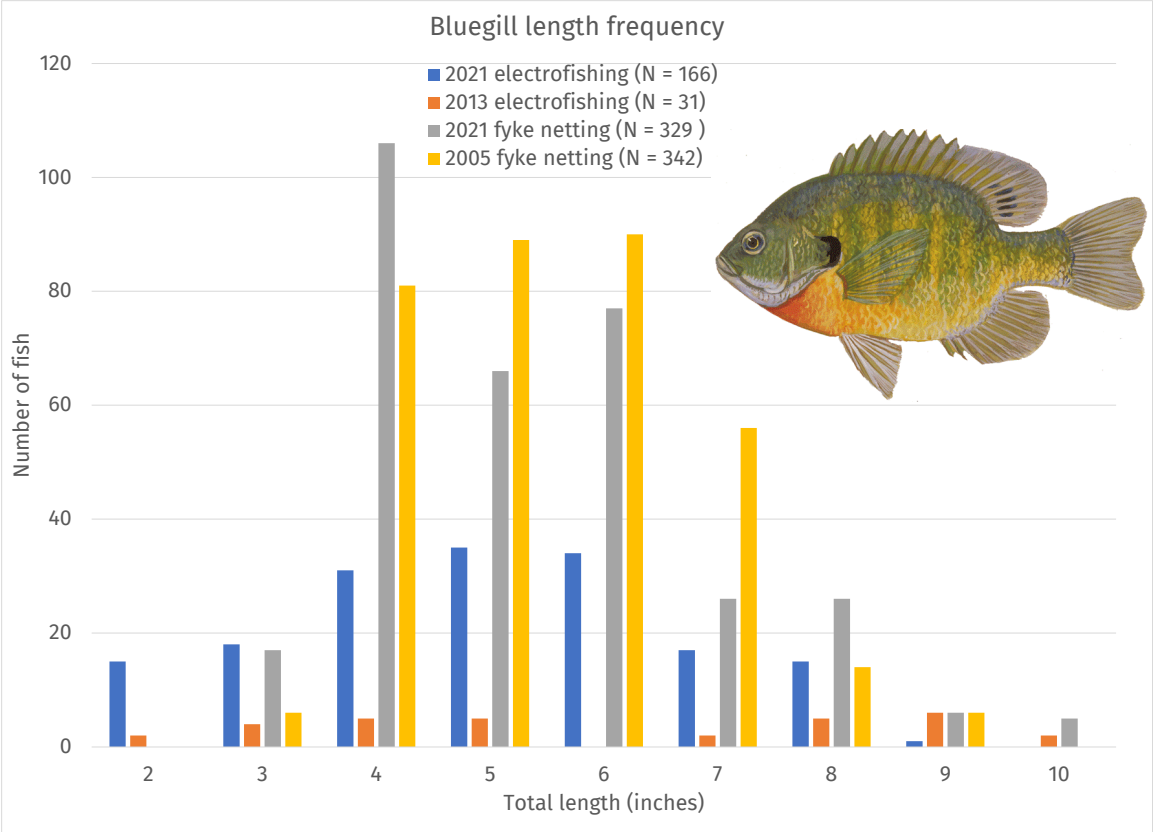


Figure 1. Length frequency of Bluegill collected in Hilbert Lake, Marinette County, WI.

A subsample of 66 Bluegill was aged from 2 to 10 years old. Thirty-six percent of the Bluegill aged were 5 years old and averaged 6.5 inches. Bluegill were stocked 3 times between 2014 and 2017 (Table 3) and the age-5 year class corresponds to one of these stocking events. In 2021, growth was average up to age 6 and improved slightly at older ages compared to the mean length at age of Bluegill in northern Wisconsin (Figure 2).

Table 3. Stocking history of Bluegill in Hilbert Lake, Marinette County, WI.

Year	Number Stocked	Average Length (inches)
2014	998	5.0
2016	837	6.0
2017	197	5.0

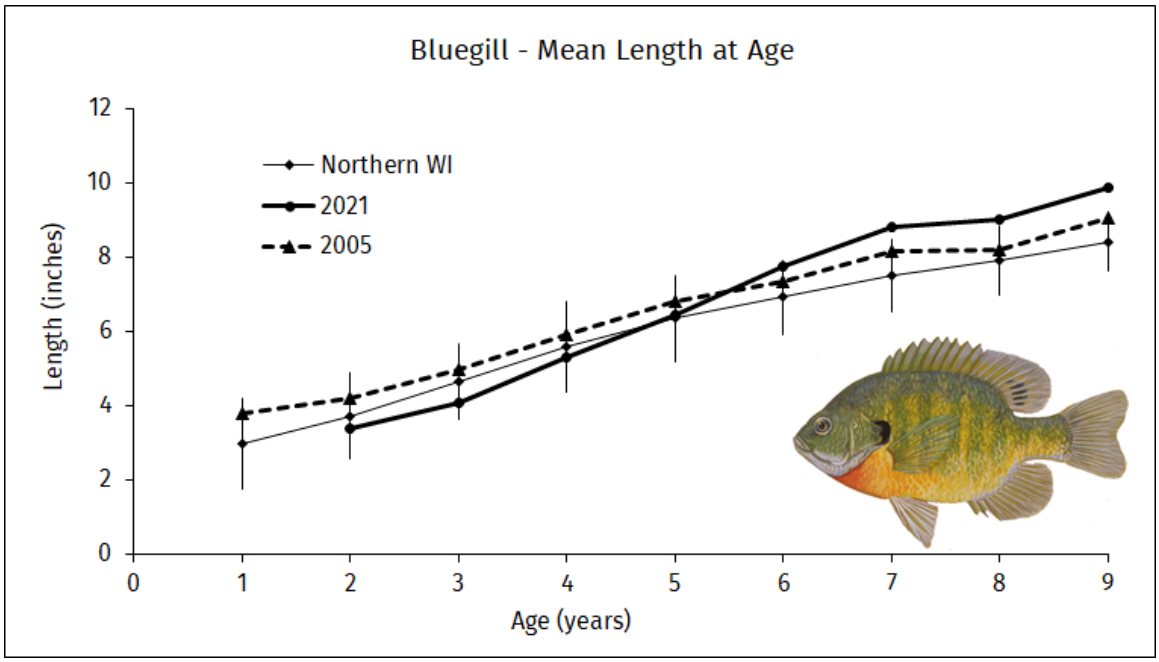


Figure 2. Mean length at age of Bluegill from 2005 and 2021 surveys in Hilbert Lake, Marinette County, WI.

Walleye made up 16% of the total catch with 232 fish collected (Table 2). This total includes Walleye collected during spring fyke netting, spring (SE1) and summer (SE2) electrofishing. Walleye ranged in length from 11.5 to 26.0 inches and averaged 18.9 inches across all samples (Figure 3). Electrofishing CPUE (SE1) was 15.2/mile and improved from the 3.6/mile observed in 2005. Spring fyke netting CPUE declined slightly from 5.6 in 2005 to 4.3 in 2021. The fall electrofishing survey was conducted prior to stocking. No young-of-the year Walleye were collected during that survey which suggests natural reproduction is not occurring in Hilbert Lake.

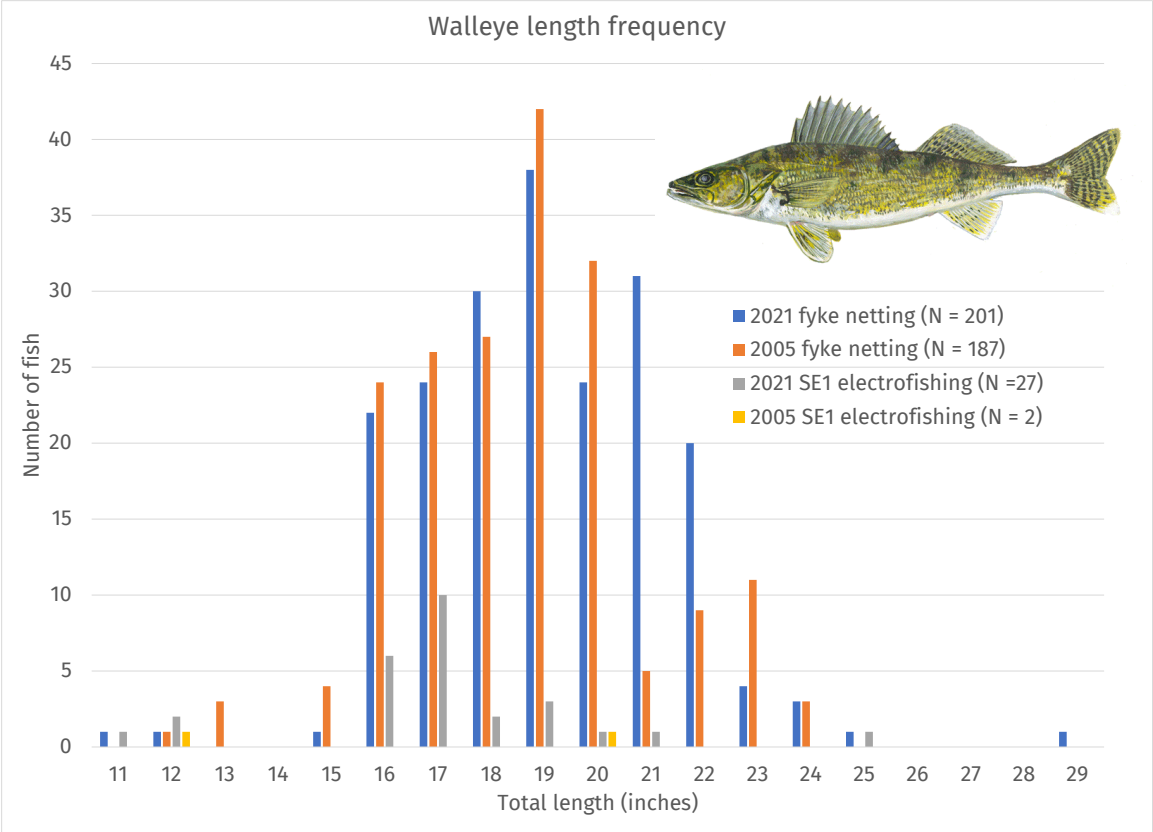


Figure 3. Length frequency of Walleye collected during 2005 and 2021 surveys in Hilbert Lake, Marinette County, WI.

A subsample of 117 Walleye was aged. Fish ranged in age from 2 to 16 years old (Figure 4). Walleye were reaching legal size (18 inches) at age 4. Strong year classes of 4- and 6-year-old Walleye were present and made up over 75% of the fish aged. These year classes also correspond to Walleye stockings in 2015 and 2017. However, Walleye stocked in 2017 averaged only 3.7 inches in length compared to 7.7 inches in 2015 (Table 1). The 2021 population estimate for adult Walleye was 289 or 1.0 adult/acre. This was less that what was observed in 2005 when the population estimate was 386 or 1.3 adults/acre. Compared to the average length at age for northern Wisconsin, Walleye growth was above average until age 6 and average at older ages. Only 1 fish represented the oldest age groups (15 and 16).

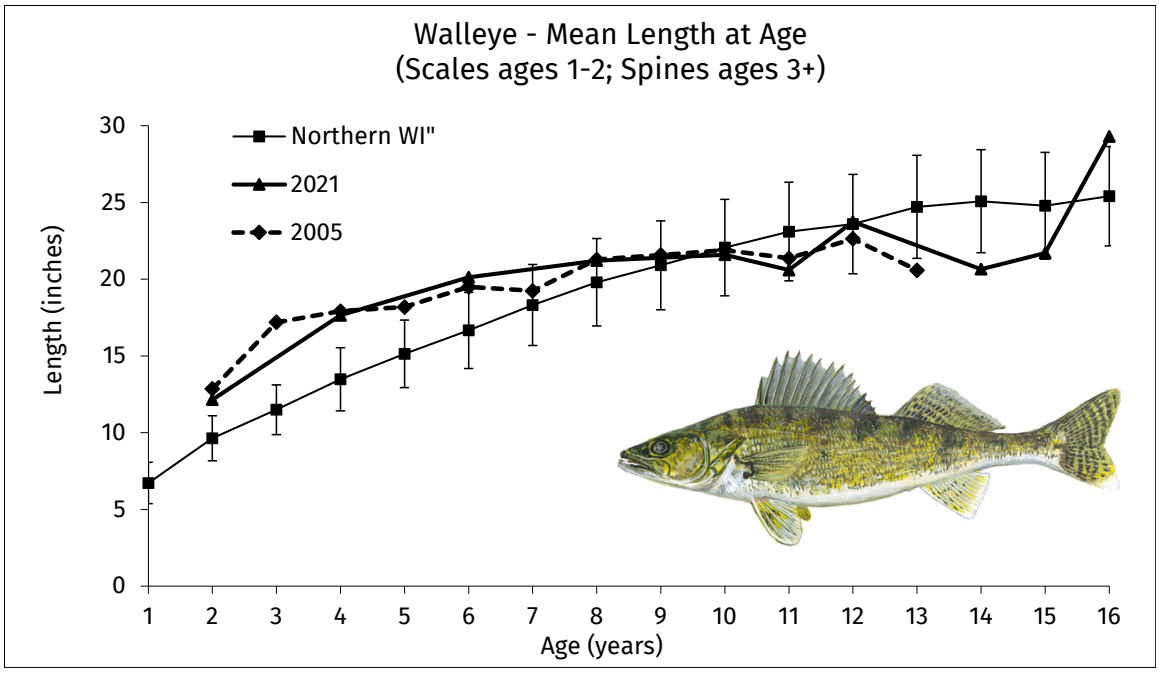


Figure 4. Mean length at age of Walleye from 2005 and 2021 surveys in Hilbert Lake, Marinette County, WI.

Largemouth Bass were the third most abundant species collected during the 2021 survey (Table 2). Overall, 187 Largemouth were collected that ranged in length from 3.0 to 19.5 inches and averaged 12.1 inches (Figure 5). Electrofishing CPUE increased substantially between 2013 and 2021 from 12.9/mile to 23.1/mile. PSD declined slightly from 78 to 71 between 2013 and 2021. However, RSD^{P} improved significantly from 5 to 22 between surveys. The increase in RSD^{P} can be attributed to the number of Bass collected over 15 inches in 2021 (Figure 5).

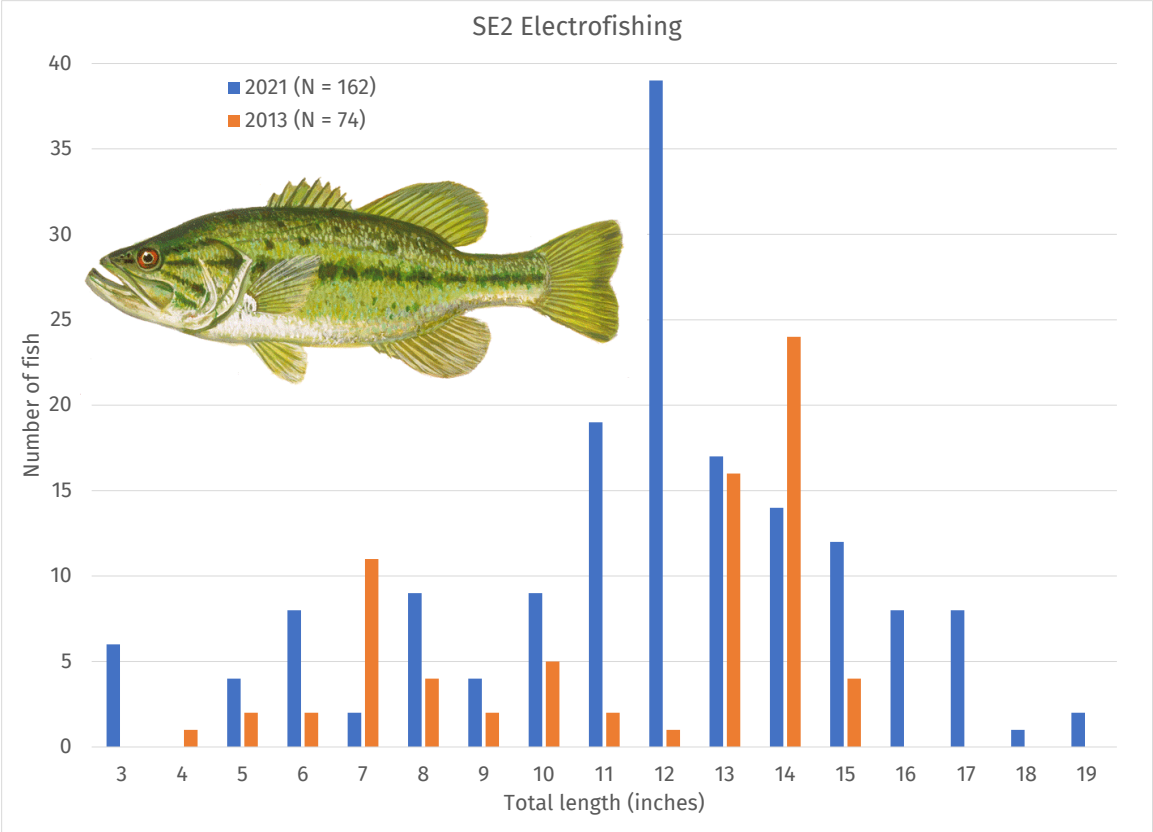


Figure 5. Length frequency of Largemouth Bass collected during 2013 and 2021 SE2 electrofishing surveys in Hilbert Lake, Marinette County, WI.

A subsample of 111 Largemouth Bass was aged using scales (<12”) and dorsal spines (>12”). Ages ranged from 1 to 13 years old (Figure 6). Bass growth was average at all ages and were reaching 14 inches between age 5 and 6. Good year classes of Largemouth Bass from age 2 through age 5 were present indicating successful reproduction and recruitment.

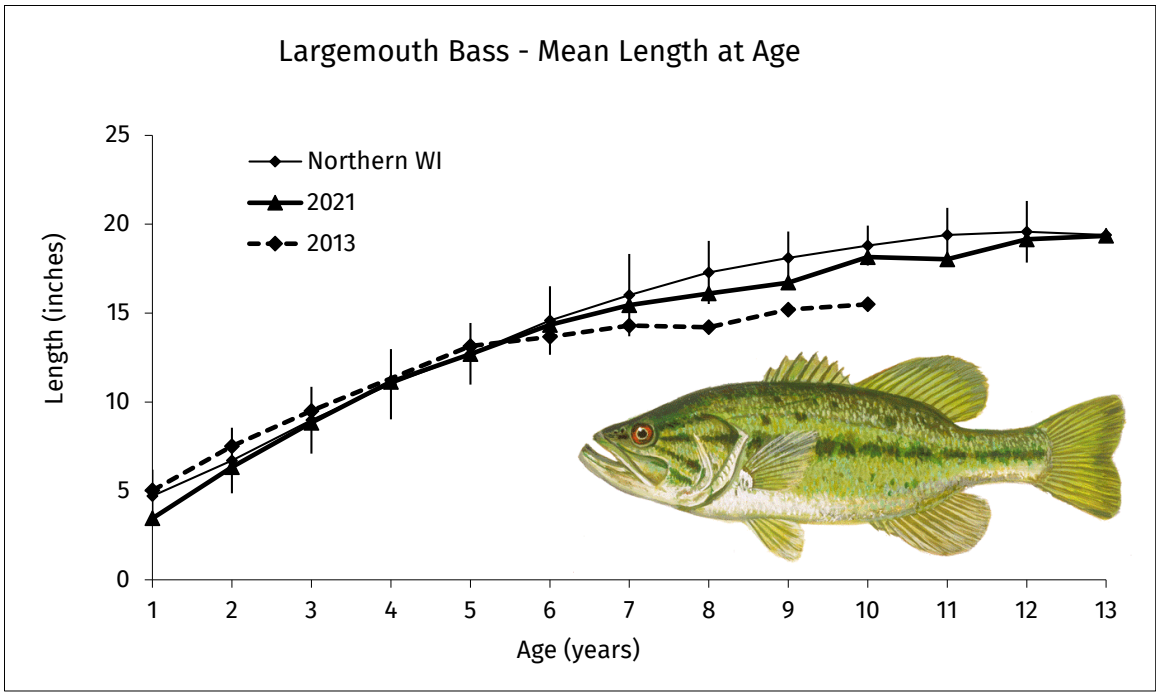


Figure 6. Mean length at age of Largemouth Bass from 2013 and 2021 surveys in Hilbert Lake, Marinette County, WI.

A total of 138 Black Crappie was collected during the survey (127 – spring fyke netting; 11 – SE2 electrofishing). Crappie ranged in length from 3.5 to 14.0 inches and averaged 7.7 inches (Figure 7). Fyke netting CPUE decreased from 5.7/NN in 2005 to 2.0/NN in 2021 despite 4 stocking events between 2014 and 2020 (Table 4).

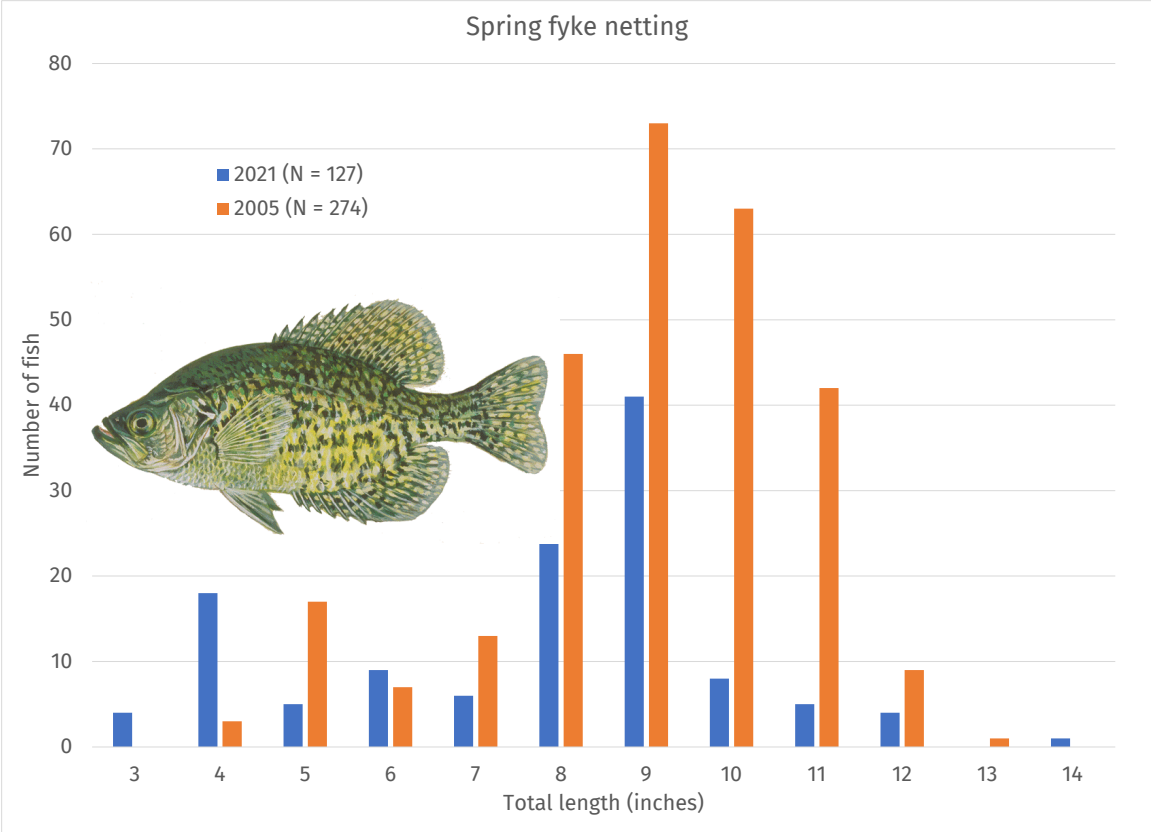
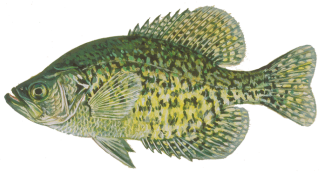


Figure 7. Length frequency of Black Crappie collected during spring fyke netting in 2005 and 2021 in Hilbert Lake, Marinette County, WI.

Table 4. Stocking history of Black Crappie in Hilbert Lake, Marinette County, WI.



Year	Number Stocked	Average Length (inches)
2014	675	5.0
2015	499	6.0
2017	195	5.0
2020	800	3.5
2021	600	5.0

A subsample of 74 Black Crappie was aged and ranged from 2 to 12 years old. Several good year classes were present, which is indicative of the cyclic spawning nature of Crappie, but none corresponded to previous stocking events. Thirty-one

percent of the Crappie aged were 5 years old and averaged 9.0 inches. In 2021, Crappie growth was average at all ages compared to the mean length at age of Crappie in northern Wisconsin (Figure 8).

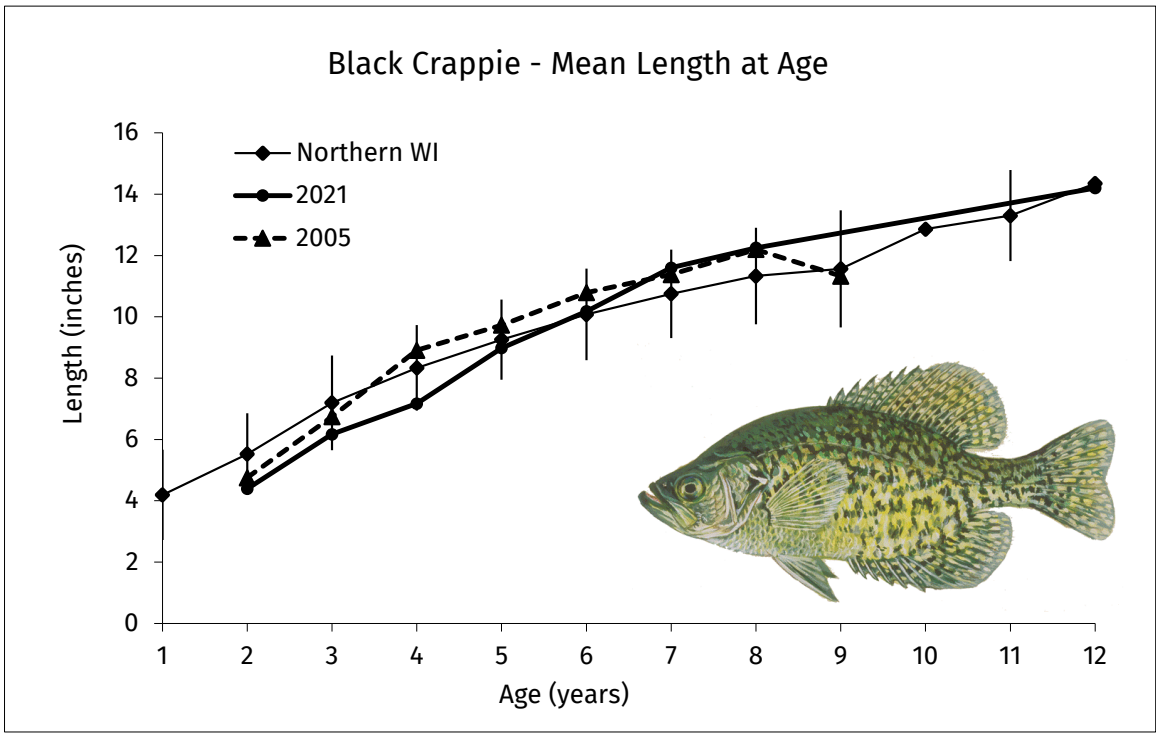


Figure 8. Mean length at age of Black Crappie from 2005 and 2021 surveys in Hilbert Lake, Marinette County, WI.

Northern Pike accounted for 9% of the fish collected (123 total). Pike ranged in length from 9.2 to 33.4 inches and averaged 21.6 inches (Figure 9). In 2021, fyke netting CPUE was 1.8/NN but declined from 2005 when CPUE was 4.6/NN. The drop in fyke netting CPUE was affected by changes in water levels between 2005 and 2021. In the late 2000's, water levels were unusually low but rose over the last several years. Increased water levels provided pike more shallow-water habitat to spawn thereby making them less vulnerable to capture during our survey. Additionally, our fyke netting effort specifically targeted spawning Walleye. Because there is little overlap in spawning habitat use by Walleye and Northern Pike, it is not surprising that fyke netting CPUE for pike was lower than the last survey.

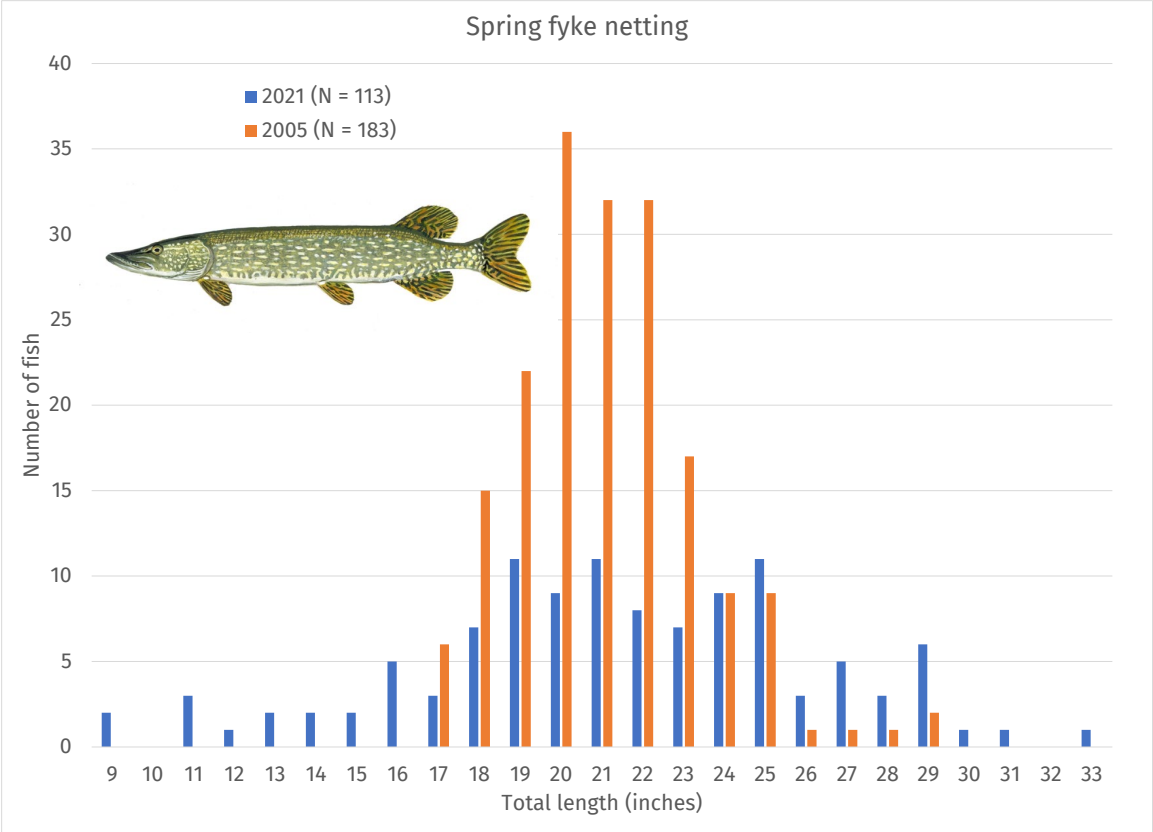


Figure 9. Length frequency of Northern Pike collected during spring fyke netting in 2005 and 2021 in Hilbert Lake, Marinette County, WI.

A subsample of 76 pike was aged using anal fin rays. Pike were aged from 2 to 11 years old (Figure 10). Northern Pike were reaching 26 inches between ages 4 and 5. Pike reproduction and recruitment were good as evidenced by the presence of consecutive year classes of younger fish (ages 1 -5).

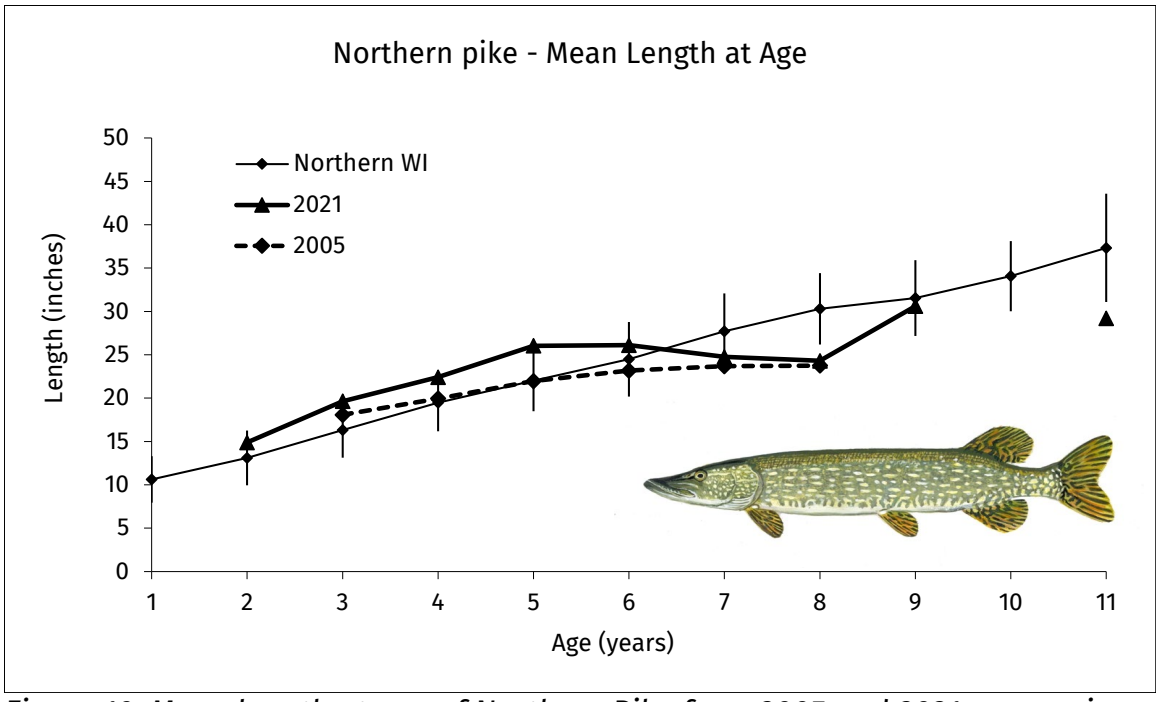


Figure 10. Mean length at age of Northern Pike from 2005 and 2021 surveys in Hilbert Lake, Marinette County, WI.

In 2005, Rock Bass were the most abundant species collected. By 2021, Rock Bass abundance declined significantly whereby fyke netting CPUE decreased from 12.6/NN in 2005 to 1.6/NN in 2021. Rock Bass averaged 6.9 inches and ranged in length from 4.0 to 10.0 inches (Figure 11).

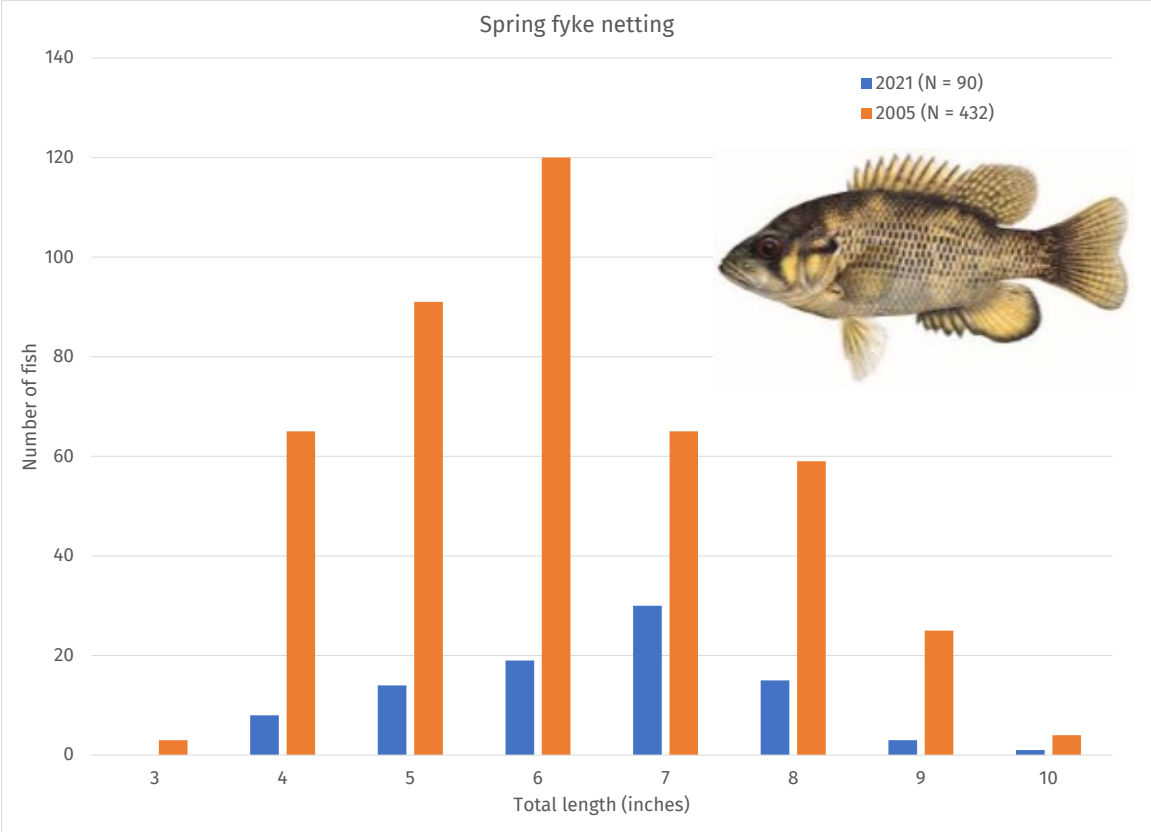


Figure 11. Length frequency of Rock Bass collected during spring fyke netting in 2005 and 2021 in Hilbert Lake, Marinette County, WI.

Yellow Perch abundance remains low despite a continued stocking effort by the Hilbert Lake Association (Table 5). Fyke netting CPUE was 0.4/NN in 2005 and 0.3/NN in 2021. Only 18 perch were collected during each spring fyke netting survey in 2005 and 2021.

Table 5. Stocking history of Yellow Perch in Hilbert Lake, Marinette County, WI.

Year	Number Stocked	Average Length (inches)
2006	1470	7.0
2008	450	8.0
2008	278	7.0
2010	750	7.0
2011	599	7.0
2012	345	8.0
2016	610	7.0
2017	200	7.0
2018	550	7.0
2019	1200	5.0
2020	600	7.5
2021	600	5.0

Smallmouth Bass contribute to the diversity of predators in Hilbert Lake but there are not many fish present. Overall, 23 Smallmouth Bass were collected that ranged in length from 6.5 to 16.0 inches and averaged 13.3 inches (Figure 12). Electrofishing CPUE was 3.0/mile in 2013 and 3.3/mile in 2021 and essentially unchanged between surveys. PSD increased from 79 to 95 between 2013 and 2021 but RSD^{P} declined slightly from 53 to 45 between surveys. This increase in PSD and decrease in RSDP can be attributed to the lack of smaller fish (<12 inches) collected in 2021 (Figure 12). Regardless, the Smallmouth Bass population continues to hang on in Hilbert Lake.

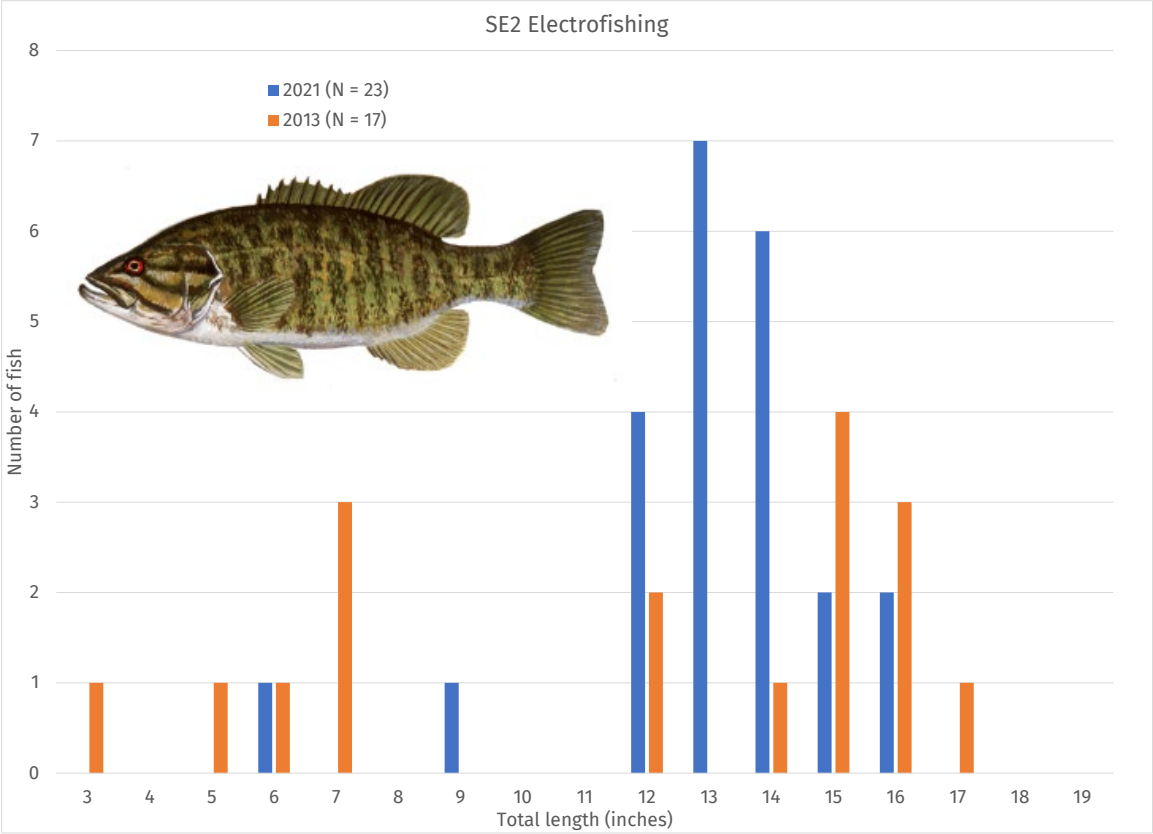


Figure 12. Length frequency of Smallmouth Bass collected during 2013 and 2021 SE2 electrofishing surveys in Hilbert Lake, Marinette County, WI.

A subsample of 22 smallmouth Bass was aged using scales (<12”) and dorsal spines (>12”). Ages ranged from 2 to 7 years old (Figure 13). Smallmouth Bass growth was average at all ages and were reaching 14 inches between age 5. Smallmouth Bass reproduction and recruitment are limited by adult abundance but are consistent to what had been observed in previous surveys.

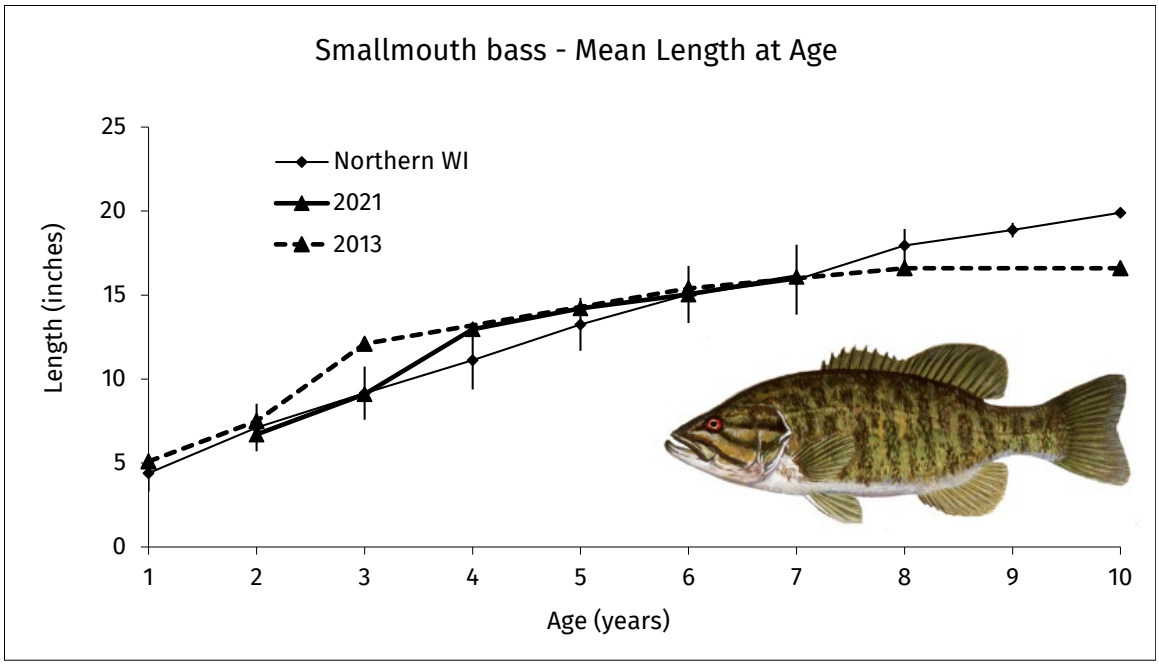


Figure 13. Mean length at age of Smallmouth Bass from 2013 and 2021 surveys in Hilbert Lake, Marinette County, WI.

Additionally, Pumpkinseed, White Sucker *Catostomus commersonii* and Bullheads *Ameiurus spp.* (black and brown) were collected and accounted for just over 3% of the total number of fish collected during the 2021 fish survey in Hilbert Lake (Table 2).

CONCLUSIONS & RECOMMENDATIONS

Hilbert Lake boasts quality fishing opportunities for a variety of species. Panfish abundance, namely Bluegill, improved between 2013 and 2021. Bluegill were stocked several times between surveys (Table 3), but increased water levels over the last several years likely had a greater influence on abundance than stocking. Increased water levels dramatically improved the available habitat panfish require for successful reproduction and recruitment. As a result, the last several years of high water have generally benefited panfish populations.

Large fingerling Walleye stocking was initiated in 2013 and new Walleye fishing regulations were established in 2015 to improve Walleye fishing opportunities on Hilbert Lake. However, adult density did not improve between 2005 and 2021. In 2005, the population estimate for adult Walleye was 386 or 1.3/acre but declined to 289 or 1.0 adult/acre in 2021. Walleye stockings prior to 2005 consisted primarily of small fingerlings (Table 1) but were able to produce a fishable Walleye population. Increasing the stocking rate of large fingerling Walleye to 10/acre in

alternate years or 5/acre annually would likely improve adult density over time and a higher stocking rate by WDNR will be pursued.

Largemouth Bass electrofishing CPUE almost doubled between 2013 and 2021 from 12.9/mile to 23.1/mile. The increase in Bass CPUE between years was likely influenced by increased water levels. Elevated water levels improved shallow-water habitat. As a result, Largemouth Bass were more vulnerable to capture. Overall, the improvement in near-shore habitat will benefit Largemouth Bass reproduction and recruitment.

Panfish stockings have had little influence on abundance since the last survey. Crappie and Yellow Perch CPUE declined between 2005 and 2021 despite several stocking events. On the other hand, Bluegill electrofishing CPUE increased substantially. However, the increased electrofishing CPUE observed between surveys can likely be attributed to enhanced littoral habitat created because of recent high-water levels.

Despite the lower fyke netting CPUE for Northern Pike, pike abundance and size structure remain similar to what was observed in previous surveys. Pike reproduction and recruitment were good. Several younger year classes (ages 1-5) will continue to provide anglers a respectable Northern Pike fishing opportunity for years to come.

In 2021, the Hilbert Lake Association constructed 15 fish cribs that were placed throughout the lake (9 during the winter and 6 in the fall) (Figure 14). The construction and placement of additional fish cribs is planned for the next several years. The Hilbert Lake Association has also expressed interest in developing additional fish habitat projects such as a Walleye spawning reef or “fish sticks”.

Figure 14. Fish crib construction on Hilbert Lake (2021), Marinette County, WI.

The current fishing regulations are adequate to provide quality fishing opportunities for a variety of species. The next comprehensive fisheries survey (spring fyke netting, electrofishing {spring, summer, fall}) of Hilbert Lake is scheduled for 2029 and will focus on the age, growth, abundance, and recruitment of the dominant gamefish. Our specific goals will be to assess Walleye density, panfish abundance and size structure.

As mentioned throughout this report, Hilbert Lake has experienced very wide swings in natural water levels. Sixteen years between netting surveys likely does not explain related changes to this fishery. Although a 2013 electrofishing survey provided very useful information that aided in the management of this fishery. While another comprehensive survey will not be conducted until 2029, we will likely perform another summer EF survey before then especially since various habitat improvements are planned.

Access to Hilbert Lake is adequate. One boat landing is located on the west side of the lake in Forest County and the other on the east side in Goodman Park (Marinette County). Boaters are reminded to remove all vegetation from their boat and trailer before leaving to limit the spread of this and other invasive species. A

map of Hilbert Lake can be found at the following internet address; http://dnr.wi.gov/lakes/maps/DNR/0501200a.pdf

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