

## 2017 Lake Winnebago Bottom Trawling Assessment Report

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There were several highlights from the 2017 Lake Winnebago bottom trawling survey, including strong yearling catch rates for walleye, crappie, and yellow perch from the 2016 year classes. The bottom trawl assessment continues to be one of the most critical fisheries assessments conducted on the Winnebago System and simply could not be conducted without the help of our dedicated volunteer base. Local volunteers continue to be the driving force behind being able to successfully complete the trawling survey each year and there were many new volunteers that boarded the Calumet in 2017. The objectives of the trawling assessment are to: 1) provide critical information on year class strength of game and nongame fish species, 2) monitor trends in the forage base, 3) monitor general population trends of game and nongame fish species. The survey also provides great opportunities for volunteers to get a hands-on experience with conducting survey work on the system.



Trawling crew showcasing the various fish species sampled from a trawl during August sampling

The survey consists of 46 standardized GPS waypoints that are sampled annually during the first week of August, September, and October. Each sampling event involves dragging a 27' wide bottom trawl net along the bottom for 5 minutes at 4 miles per hour, equating to about a 1 acre sample area. A fair amount of adult fish are captured during the survey, but the trawl is most effective at catching small fish (young of year (YOY) and yearlings). The standardized survey has been conducted since 1986, thus providing a long-term data set to evaluate trends in recruitment and adult abundance of various important game, pan, and forage fish species within Lake Winnebago.

## Walleye

The 2017 YOY walleye catch rate was 4.1/trawl, which is just below the overall average of 4.5/trawl (Figure 1). Although the 2017 catch rate didn't rank as a top ten year class like in 2016 (9.9/trawl, ranked 7<sup>th</sup> since 1986), a measurable year class was still produced. The trawling survey also revealed strong numbers of yearling walleye (2016 year class) with a catch rate of 6.5 yearling walleye/trawl in 2017 (ranked as the 3<sup>rd</sup> highest yearling catch since 1986). Favorable growing conditions, extended growing season and abundant forage, during 2016 and 2017 resulted in good growth of walleye from the 2016 year class (average length 10.3 inches during October trawling). As a result, the strong 2016 year class and measurable 2017 year class should contribute to the adult population in future years.

Spring water levels on the Wolf and upper Fox River are one of the main factors that drive walleye year class strength. High spring water levels are crucial for providing suitable walleye spawning conditions, including giving adult fish access to marsh habitat, while also providing adequate flows to keep eggs well aerated and flush out newly hatched fry. The 2017 Wolf River hydrograph in New London indicated 3 peaks in discharge throughout the spring, with the first peak discharge of 5,110 cubic feet per second (cfs) occurring on March 9 (Figure 2). The first peak in the hydrograph during early March provided just enough flow for the upper walleye marshes near New London and Shiocton to operate. However, many of the marshes located further downstream were dry, thus water level conditions weren't optimal for walleye spawning on the Wolf River.

River discharge decreased throughout March, reaching a low of 2,960 cfs on March 25<sup>th</sup>, before rain events led to a second peak (4,060 cfs) in discharge on April 6<sup>th</sup>. With peak walleye spawning occurring in early-mid April, this second peak in discharge was likely crucial for maintaining adequate water levels for spawning adults and maintaining water levels for egg incubation.

Discharge then decreased to 3,540 cfs by April 15<sup>th</sup>, before increasing throughout late April to a third peak discharge (6,310 cfs) on May 4<sup>th</sup>. Although most spawning was already complete by late April, this third peak in flow likely provided adequate conditions for egg incubation and to flush hatching fry from the marshes. Although 2017 spring conditions weren't optimal for walleye spawning compared to years such as 2016 and 2013, conditions were adequate for providing a measurable year class. Stay tuned for the 2017 Winnebago walleye report for more details regarding the overall walleye population and fishery.

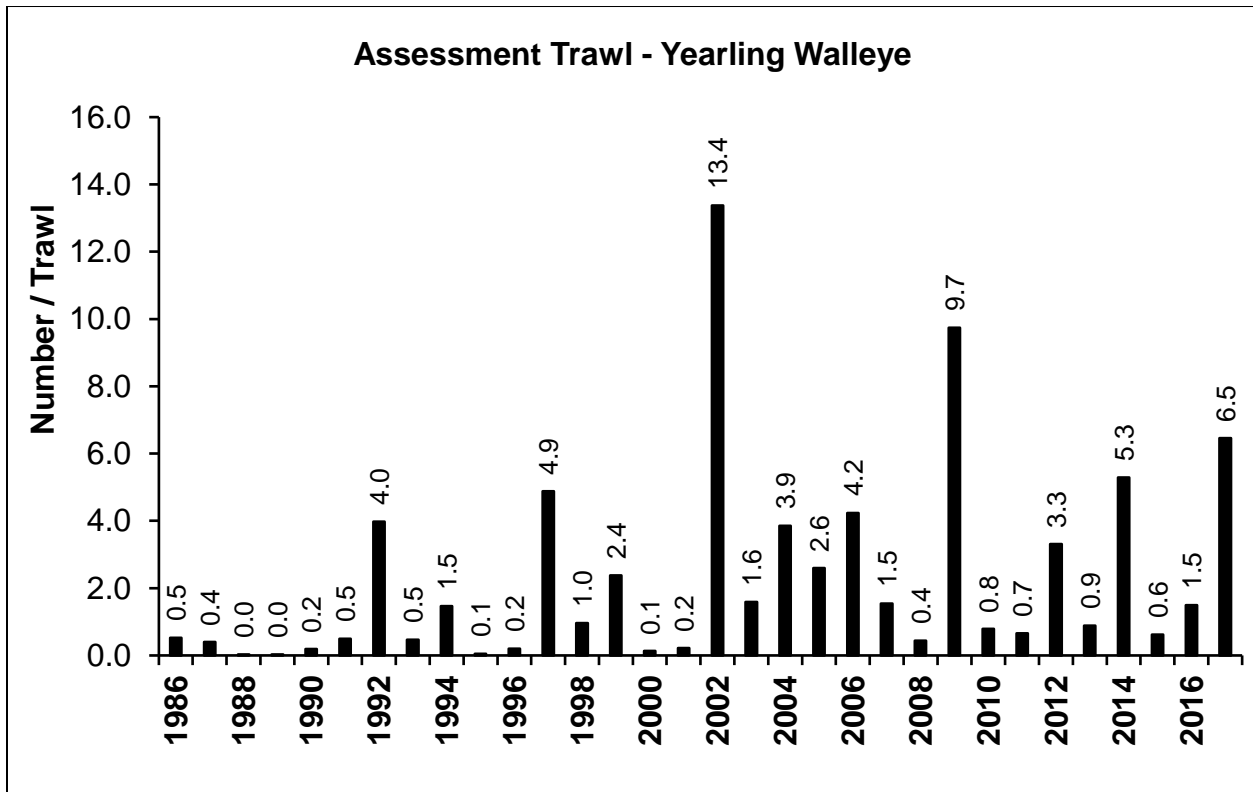
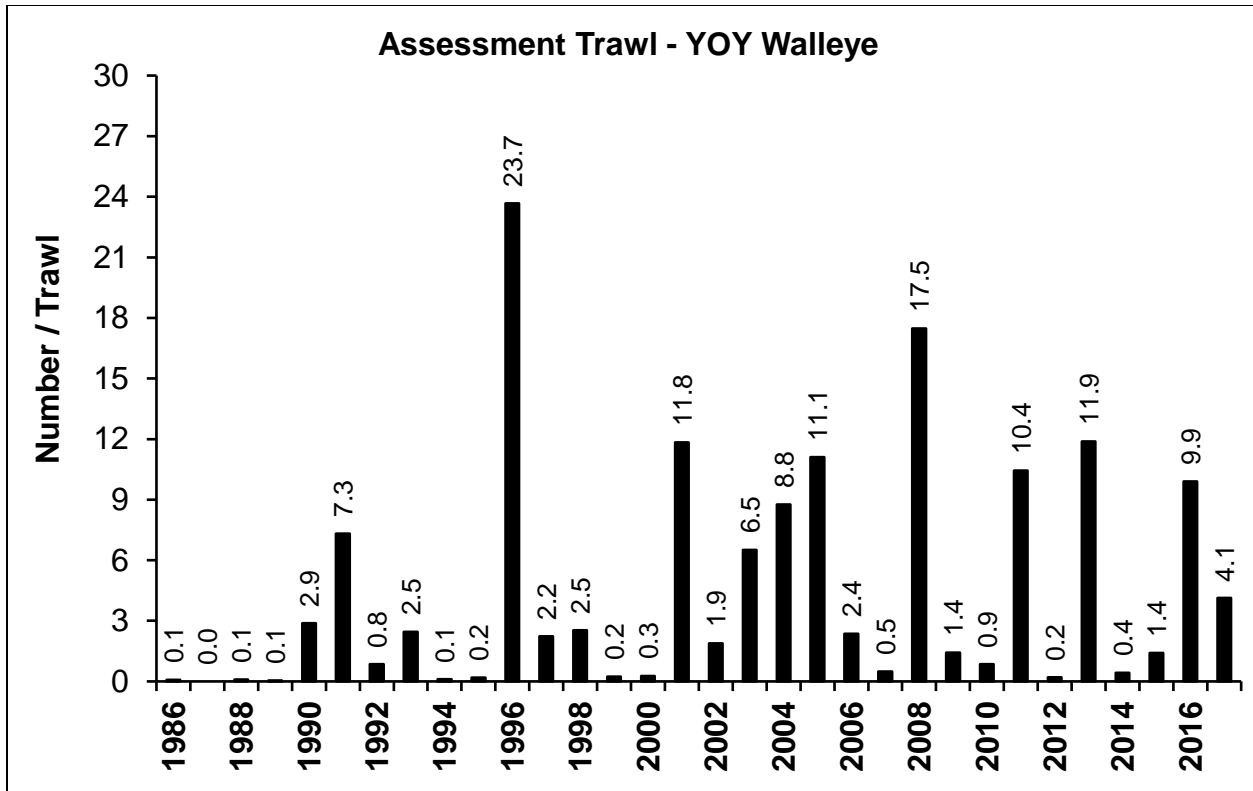


Figure 1. Average number of yearling walleye/trawl (lower panel) and YOY walleye/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

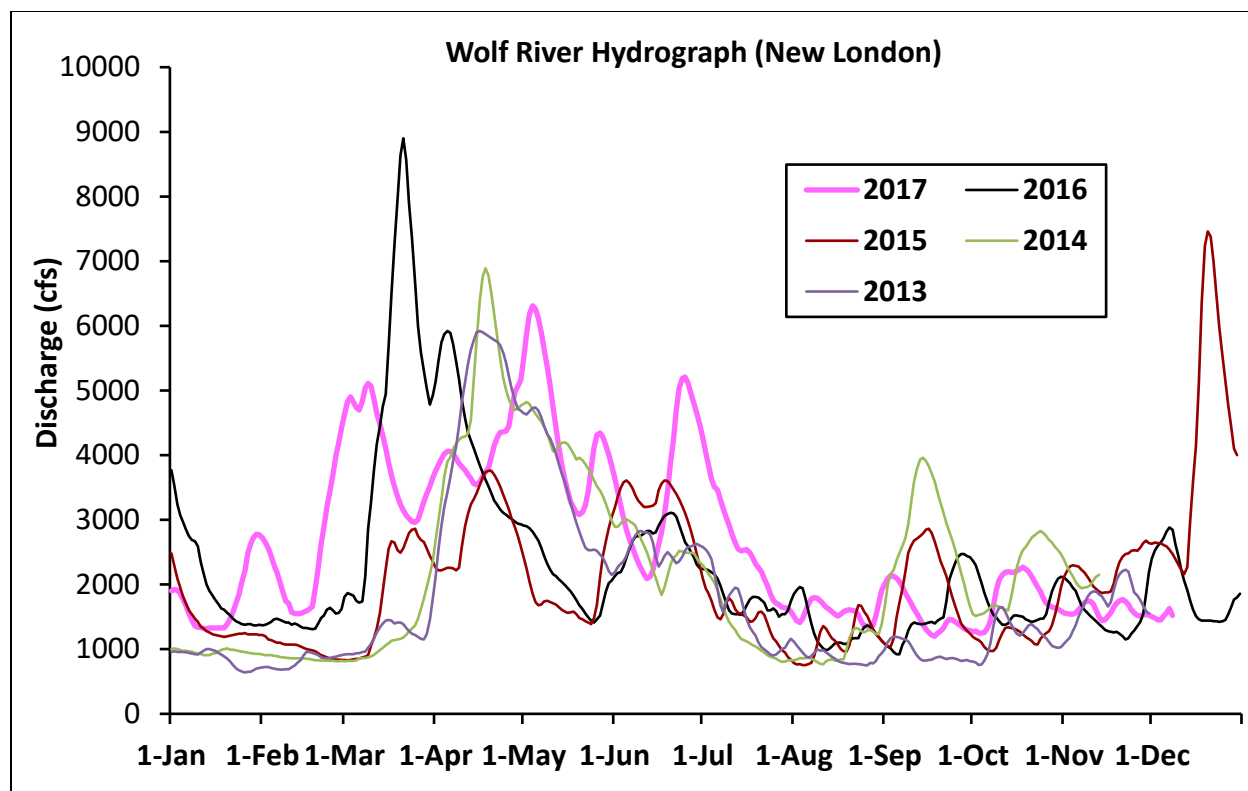


Figure 2. Average daily discharge (cfs) at the USGS Wolf River gauging station in New London from 2013-2017.

### Sauger

There were no YOY sauger captured during the 2017 trawling survey. Since fry stocking ceased in 2010, only 15 YOY saugers have been sampled. Although some natural reproduction is likely occurring, YOY catch rates and year class strength continue to be low since the Sauger Rehabilitation Program ended in 2010 (Figure 3). The program was conducted on Lake Winnebago from 2001-2010 and included several facets. Rock reefs were installed on the north end of Lake Winnebago to bolster sauger spawning habitat and extensive stocking was conducted (7,998,000 fry, 10,000 fingerlings, and 6,576 extended growth fingerlings in Lake Winnebago). The goal of the program was to enhance sauger spawning habitat and increase adult sauger numbers to increase the potential for natural reproduction.

As a result of the project efforts, catch rates of YOY sauger sampled during annual trawl surveys increased between 2001-2010 and adult sauger also increased from 0.24/trawl in 2001 to 2.49/trawl in 2010 (Figure 3). However, the lack of natural reproduction since the stocking efforts ceased in 2010 has led to a decrease in adult sauger numbers. In fact, the 2017 adult sauger catch rate (0.6/trawl) was similar to catch rates observed prior to the Sauger Rehabilitation Program.

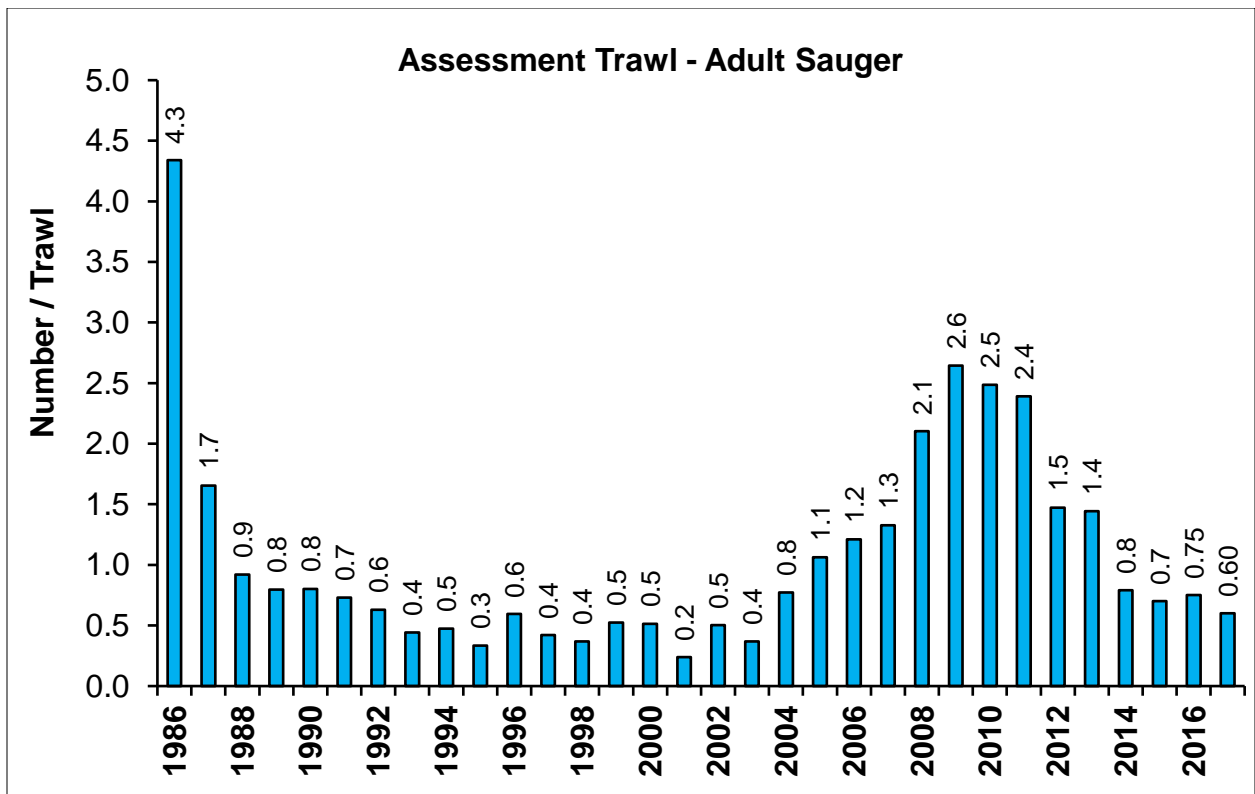
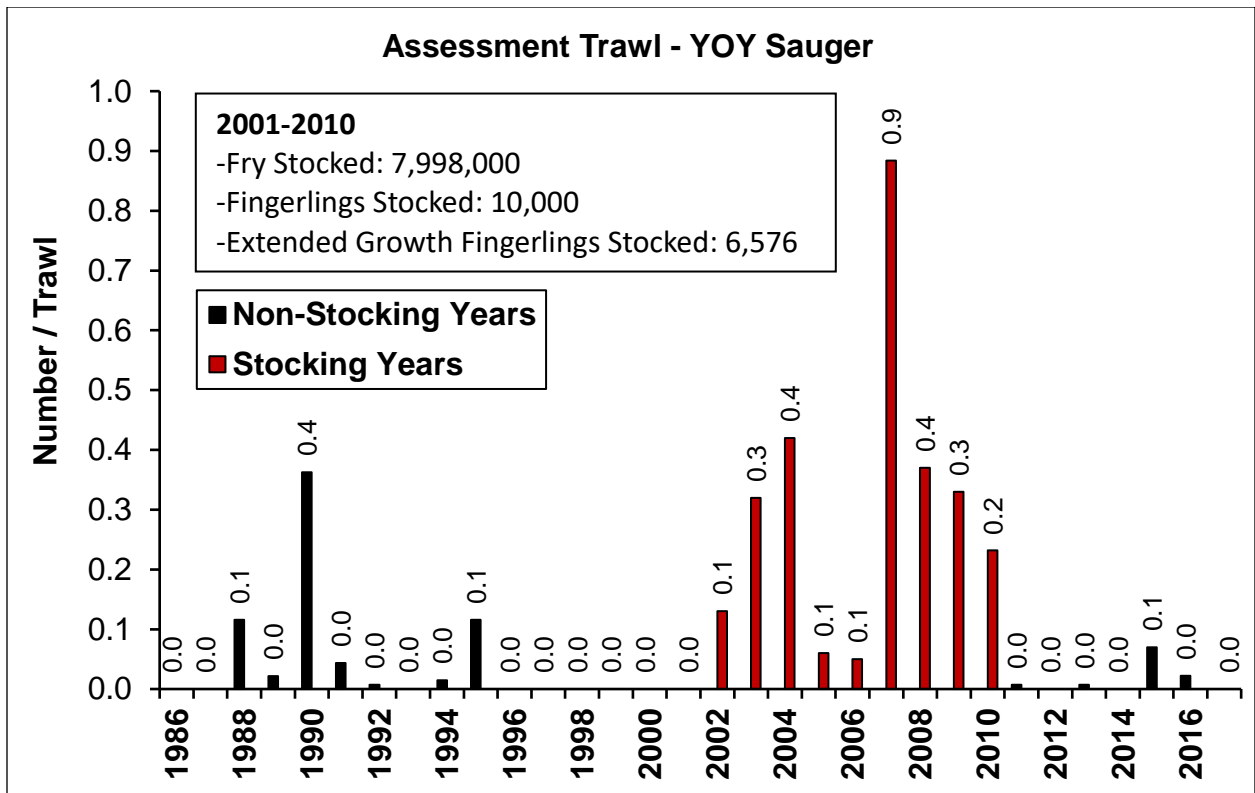


Figure 3. Average number of adult sauger/trawl (lower panel) and YOY sauger/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

During the 2016 Winnebago Fisheries Advisory Council (WFAC) meeting representatives from various clubs discussed the current state of the sauger population and management options going forward. Three options were discussed including: (1) let nature prevail and likely manage for a low density population, (2) resume sauger fry stocking in Lake Winnebago to increase adult numbers, and (3) experimental fry stocking in the upper Fox River. It was also discussed that options 2 and 3 would require volunteers to lead the project with limited Department staff involvement. Various pros and cons were discussed for each option and WFAC members voted for option three and Walleyes for Tomorrow offered to lead the project.

The upper Fox River is quite turbid and does have some gravel/rock substrate, which is similar to other rivers in the Midwest where spawning river run sauger populations exist. Therefore, it is possible that the upper Fox River could provide habitat suitable to meet the various life history requirements of sauger and may have the potential to support a naturally reproducing population. The Upper Fox River Experimental Sauger Fry Stocking Project has three primary objectives: (1) assess sauger recruitment (natural and stocked) via fall bottom trawl surveys conducted on Lake Winnebago and electrofishing surveys conducted on the upper Fox River and Lake Butte des Morts, (2) evaluate sauger movement in the upper Fox River and throughout the system, and (3) evaluate the potential for natural reproduction in the upper Fox River if adult spawning runs occur.

Volunteers from Walleyes for Tomorrow led efforts to begin experimental fry stocking on the upper Fox River in spring of 2017. Approximately 200 adult sauger were netted on the north end of Lake Winnebago. Spawn was taken from fish at High Cliff State Park and transferred to a portable walleye wagon on the upper Fox River in Berlin, approximately 597,500 fry were stocked at the site. Genetic samples were taken from all adult parents, which will allow for sauger captured during future years to be genetically tested to evaluate if they were produced from fry stockings or natural reproduction. The 2017 efforts served as a pilot year for the project and Walleyes for Tomorrow plans to run the project for 3-5 years. It will certainly be interesting to see how the project develops in future years as preliminary results become available.

### **Crappie**

The 2017 YOY crappie catch averaged 0.9/trawl, ranking below the historical average of 2.9/trawl. Although a weak year class was produced in 2017, one of the highlights of the 2017 survey was the strong showing of yearling crappie from the record 2016 year class (24.1 YOY/trawl). In fact, the 2016 YOY catch rate more than doubled the previous highest ranked catches of 11.4/trawl in 2010 and 6.8 in 2009 (Figure 4). Fish from the 2016 year class seem to have survived well also, as the 2017 yearling crappie catch rate was 7.7/trawl, which ranks 2<sup>nd</sup> on record behind only 2011 (12.9/trawl). Although the strong crappie year classes from 2009

and 2010 have provided some great fishing opportunities, these dominant year classes have decreased in abundance and will continue to fade out of the adult population. Fortunately, the phenomenal 2016 year class has demonstrated good growth, yearlings averaged 7.3 inches (range 6.2-8.2 inches) during October sampling. Therefore, keeper sized crappies could start showing up after another summer of growth and into 2019.

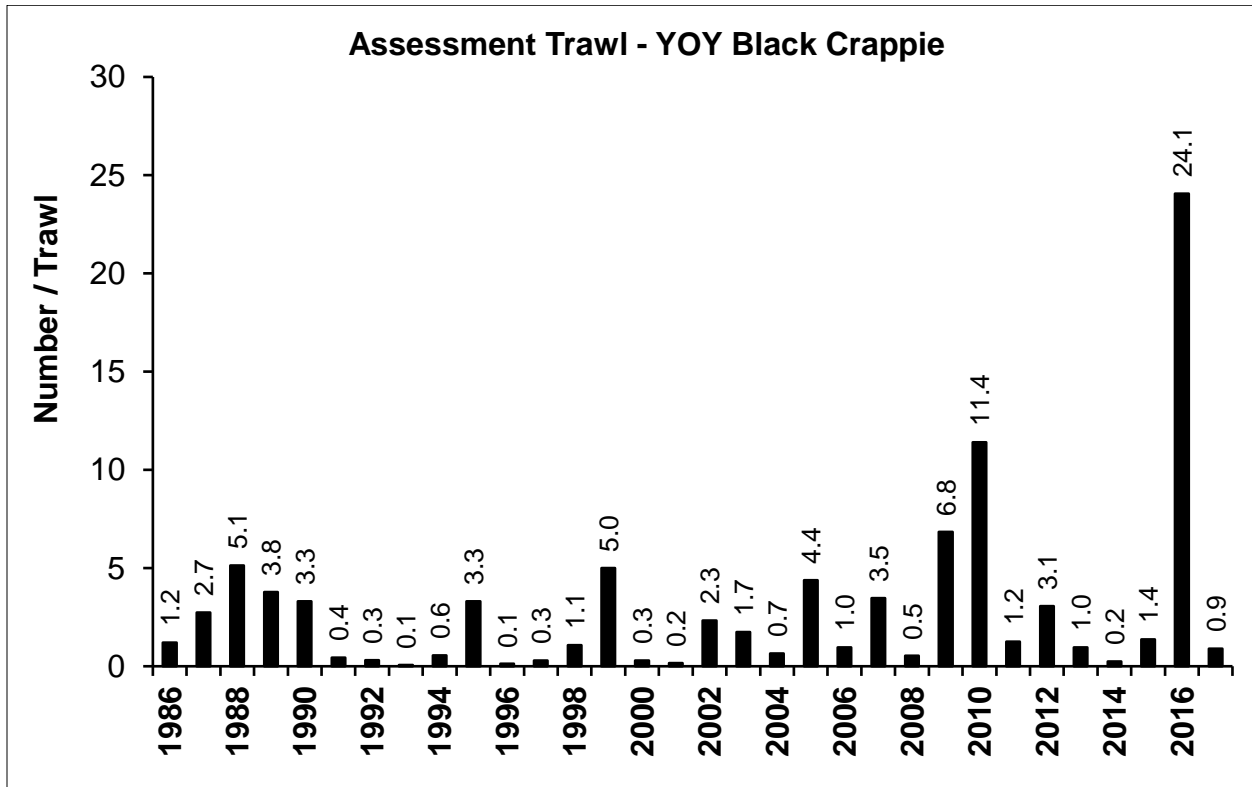


Figure 4. Average number of YOY black crappie/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

### Yellow Perch

The 2017 YOY yellow perch catch averaged 0.8/trawl, ranking below the historical average of 1.6/trawl (Figure 5). However, similar to crappie the yearling yellow perch catch was strong. Although 2017 will be documented as a weak year class, the outlook is more positive than in the past few years. In fact, the 2017 adult yellow perch catch rate of 10.6/trawl (mainly comprised of yearlings) ranked as the third highest adult perch catch since 1986 behind only 2006 (21.4/trawl) and 2011 (14.0/trawl). Yearling yellow perch captured during 2017 October trawling efforts averaged 7.3 inches (range: 6.2-8.5 inches). Therefore, it is likely that 2018 could produce some of the best yellow perch fishing opportunities on the system since 2012. A more detailed yellow perch report will be coming out in the near future. Contact Ryan Koenigs ([Ryan.koenigs@wisconsin.gov](mailto:Ryan.koenigs@wisconsin.gov)) if you have any specific questions related to yellow perch assessment or management on the Winnebago System.

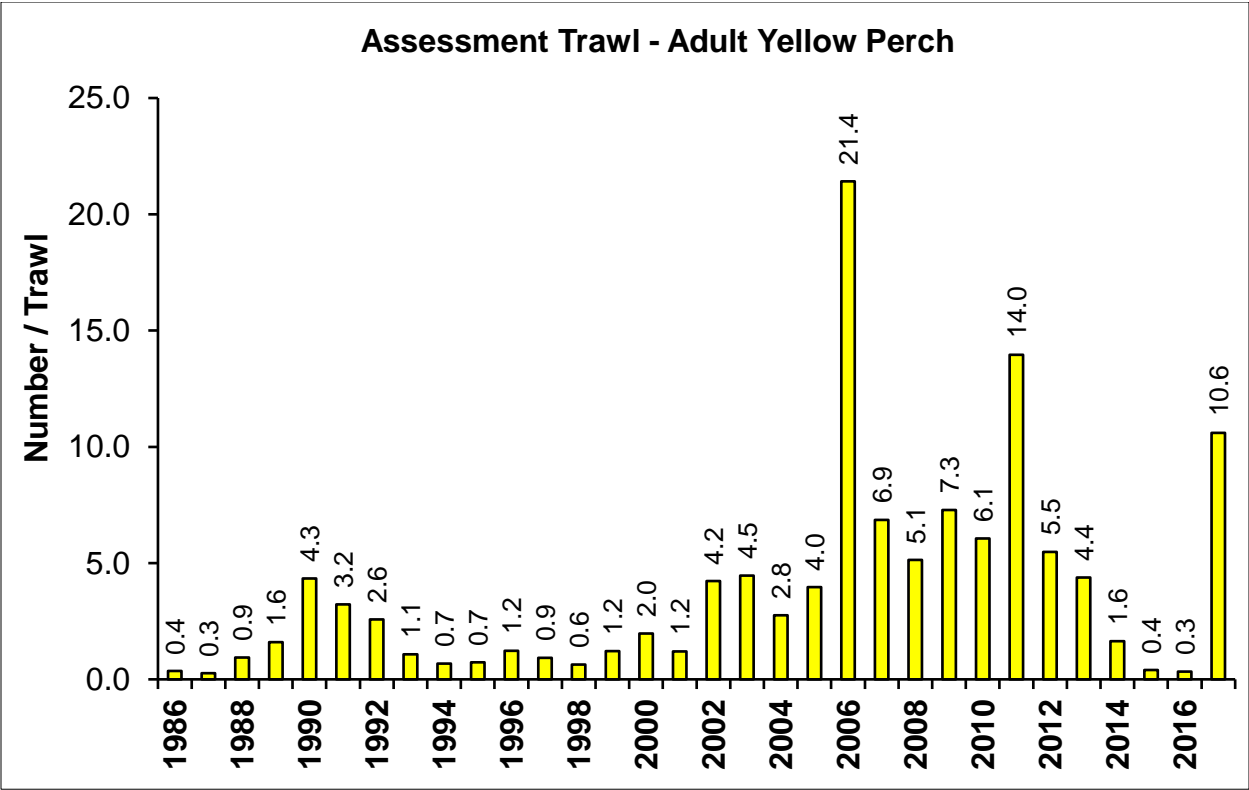
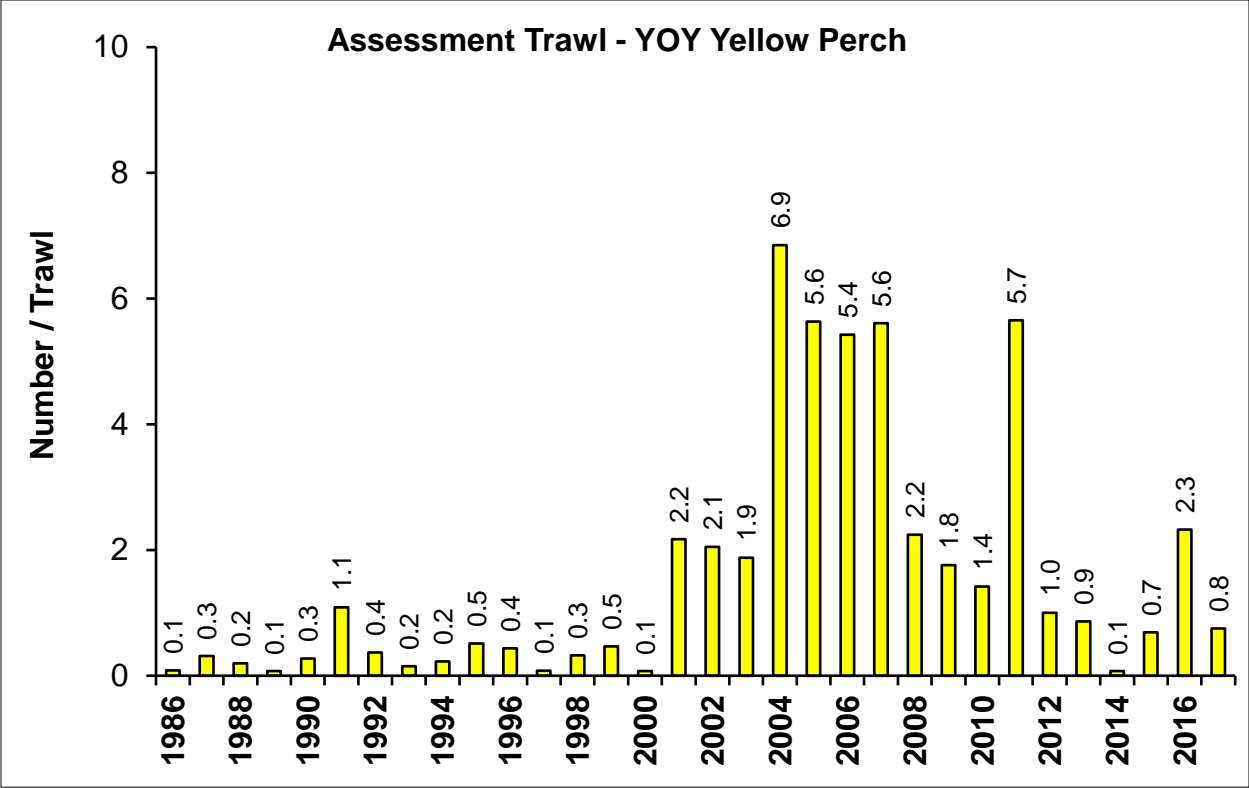


Figure 5. Average number of adult yellow perch/trawl (lower panel) and YOY yellow perch/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.



## White Bass

White bass continue to be a dominant species sampled in bottom trawl surveys, averaging 32.0 YOY/trawl since 1986 (Figure 6). The 2017 YOY white bass catch rate was 7.4/trawl indicating a weak year class. The strong 2011 year class (2<sup>nd</sup> largest on record; averaged 102.4/trawl) and above average 2012 year class continue to drive the fishery and provide angling opportunities. The weak, but measurable 2015-2017 year classes should also help to provide some additional white bass fishing opportunities in the future.

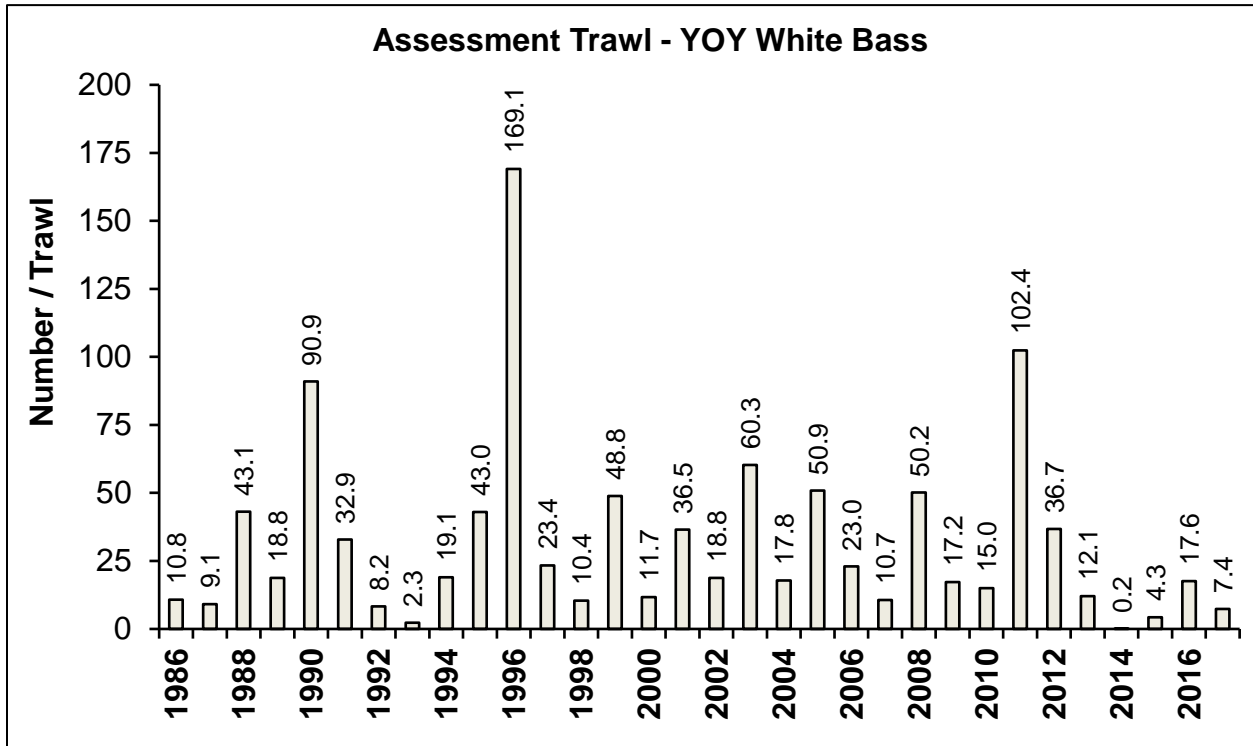


Figure 6. Average number of YOY white bass/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

## Forage Fish Species

### *Trout Perch*

One of the highlights of the trawling survey the last two years has been the resurgence of YOY trout perch catch rates. The average YOY catch of 359.8/trawl in 2016 and 456.3/trawl in 2017 surpassed the historical average catch rate of 220.4/trawl (Figure 7). Trout perch continue to be a staple diet item for many gamefish species and the small size of YOY trout perch provide important forage for other larger juvenile gamefish species, particularly walleye and black crappie. Nonetheless, the increase in trout perch numbers since the low catches between 2012-2015 (average catch of 108.7/trawl) is a key factor for maintaining a stable forage base and sport fishery.

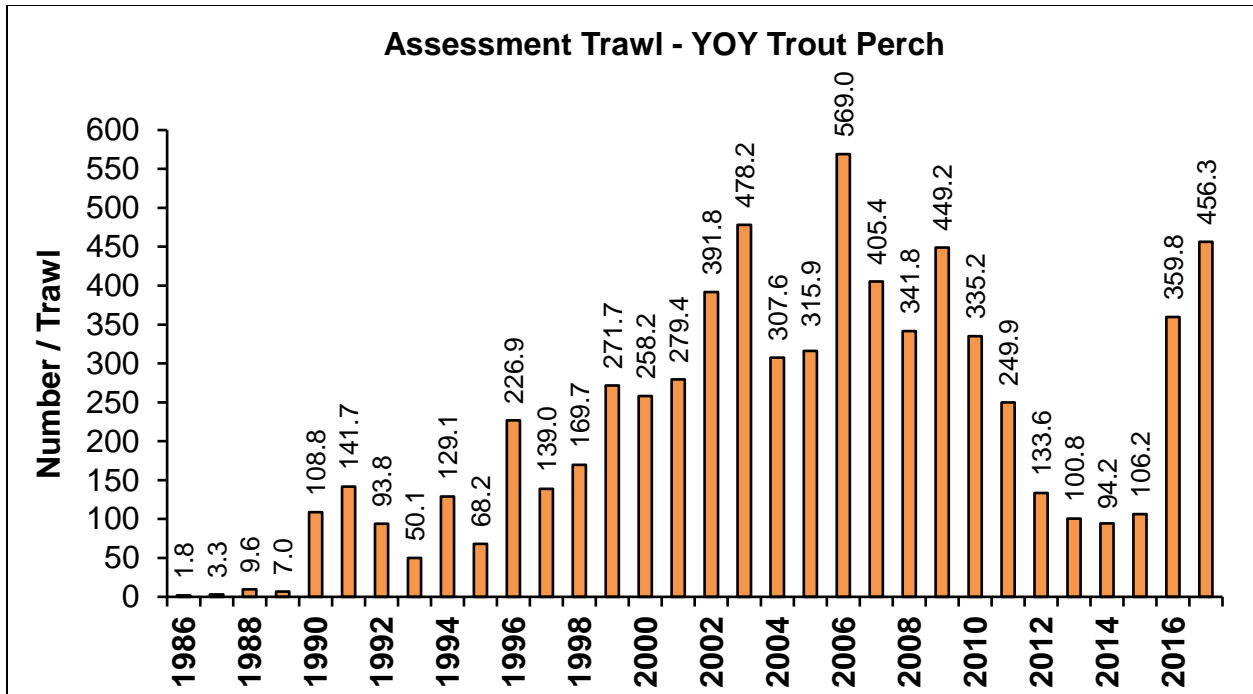


Figure 7. Average number of YOY trout perch/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

### *Gizzard Shad*

Gizzard shad are an important forage fish found in the Winnebago System and are well known for their boom and bust recruitment cycles. The 2017 trawling survey revealed a weak gizzard shad hatch with a catch rate of 1.3 YOY gizzard shad/trawl (Figure 8). In fact, 2017 will be documented as the lowest catch rate observed since 1998 (0.1/trawl). Anglers throughout the system know that gizzard shad can often dictate fishing success for gamefish species, particularly walleye and northern pike. Therefore, the weak 2017 gizzard shad hatch could lead to some productive fishing opportunities for walleye and maybe even some toothy northern pike around system.

Despite the poor gizzard shad hatch, yearling shad were captured in high numbers. In fact, the adult (primarily yearling) gizzard shad catch rate of 10.2/trawl ranked as the highest on record and nearly doubled the second highest catch rate in 2011 (6.6/trawl; Figure 8). The high 2017 yearling gizzard shad catch is the result of above average winter survival of the strong 2016 year class. Wisconsin is at the northern range of gizzard shad distribution so winter die offs are a natural event, however, it appears that the mild winter of 2016-17 led to better overall gizzard shad winter survival. Due to quick growth rates exhibited by shad, the yearling fish are already 7-9 inches long and surpass the gape width for species such as walleye. Nevertheless, it will be interesting to see what yearling shad survival is like during the 2018-19 winter.

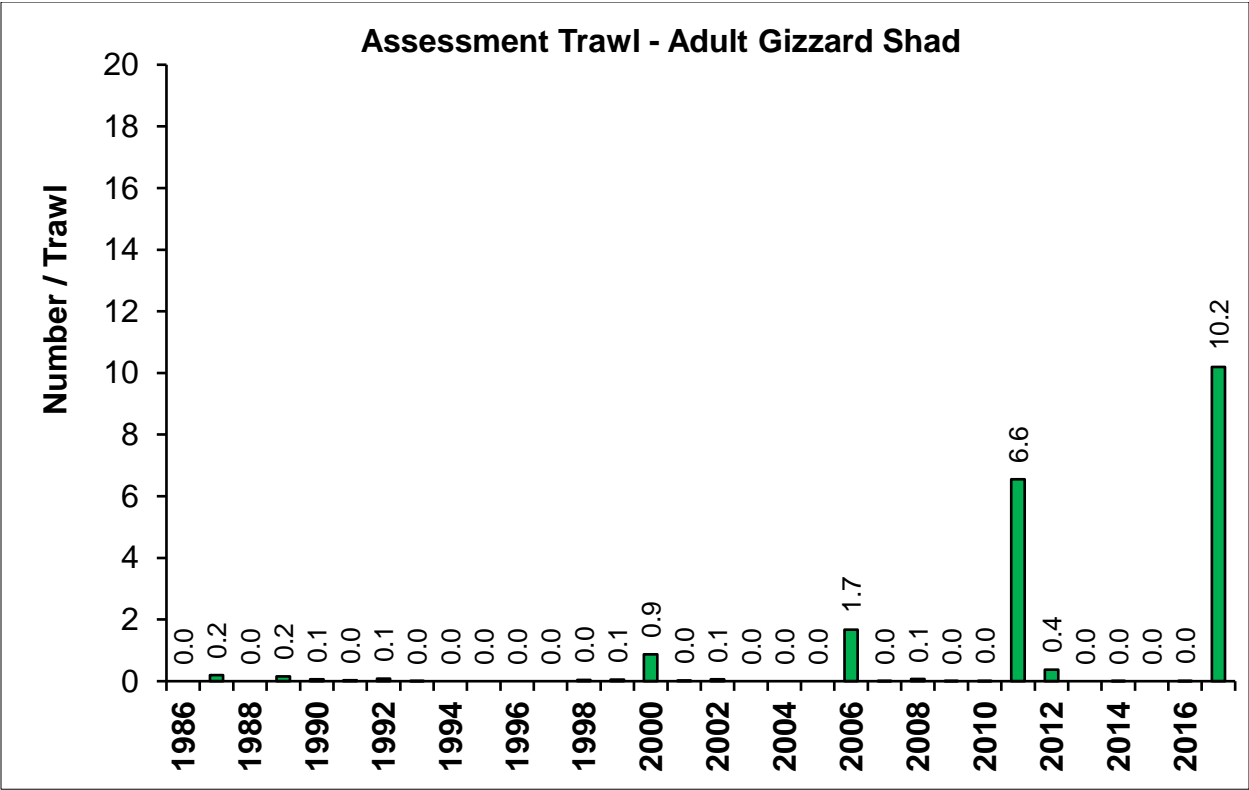
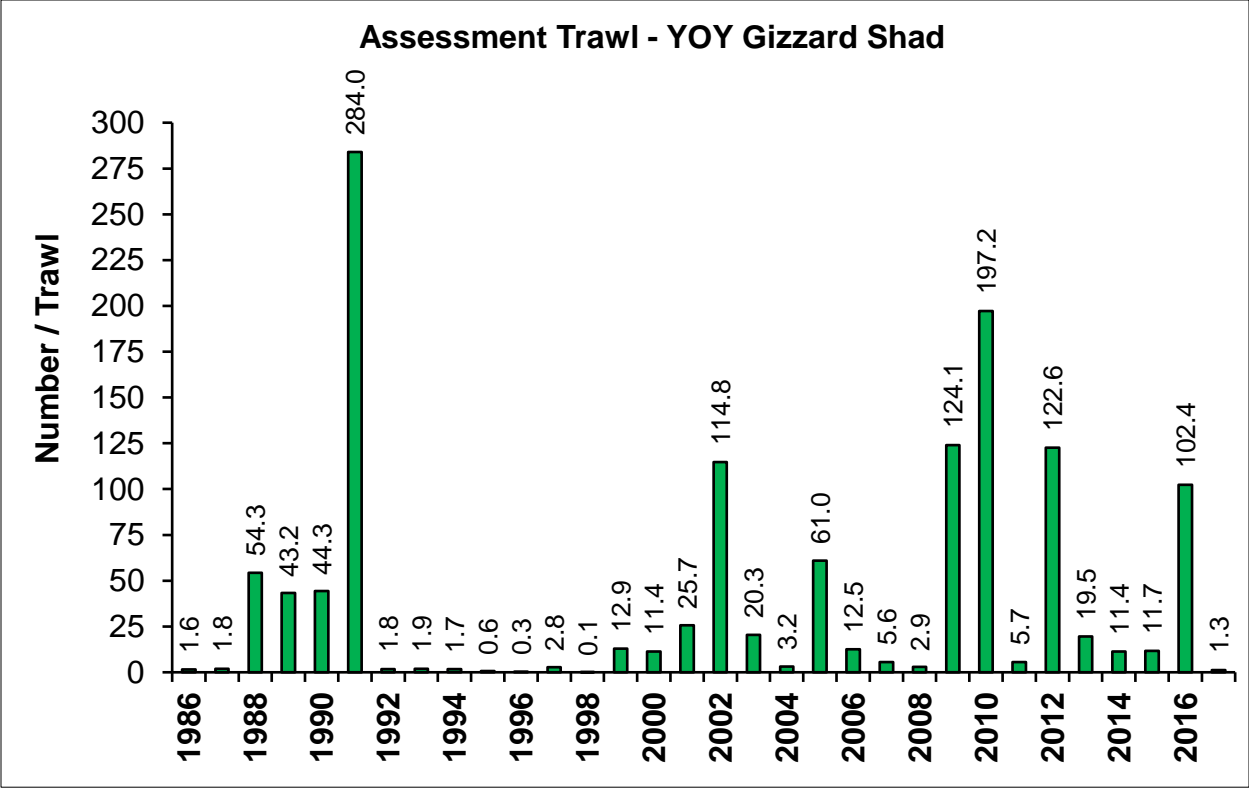


Figure 8. Average number of adult gizzard shad/trawl (lower panel) and YOY gizzard shad/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

## Freshwater Drum

Lastly and often overlooked, YOY freshwater drum are an important forage item within the food web. Unlike the boom and bust nature of gizzard shad, measurable year classes of freshwater drum are produced annually providing stability to the forage base. The 2017 YOY freshwater drum catch of 50.8/trawl was below the historical average of 86.6/trawl, but will qualify as another measurable year class (Figure 9). In addition, adult freshwater drum dominate trawling catch and adult numbers have been stable since the survey began in 1986 (average catch rate of 490.7/trawl). The 2017 adult catch rate of 734.5/trawl ranked as the second highest catch since 1986. The high 2017 catch rate can be attributed to yearlings that were sampled from the above average 2016 year class and adults from the strong 2012 year class. Nonetheless, it appears that adult freshwater drum will continue to be a dominant fish species sampled during future years.

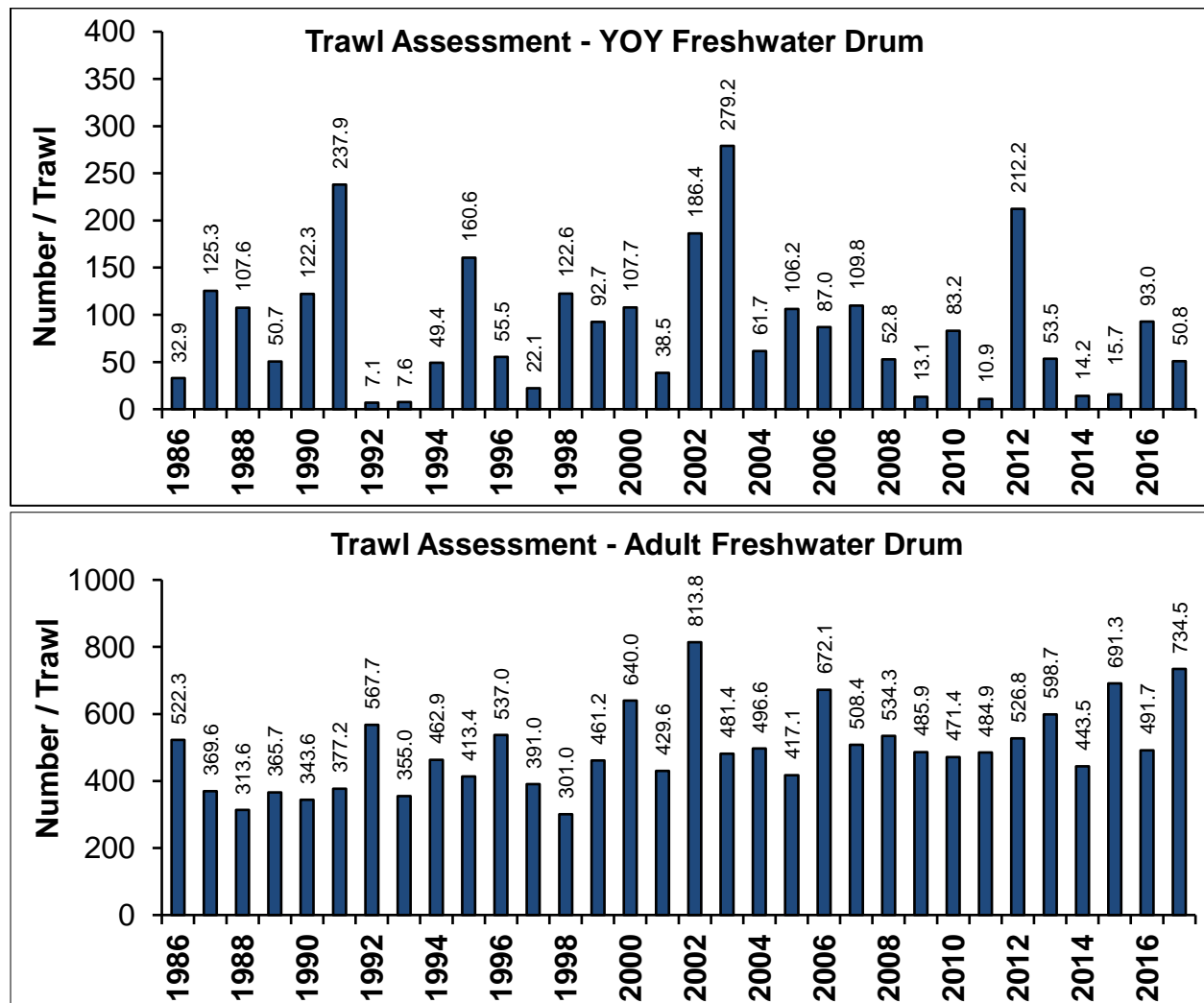


Figure 9. Average number of adult freshwater drum/trawl (lower panel) and YOY freshwater drum/trawl (upper panel) captured during bottom trawl assessments conducted on Lake Winnebago from 1986-2017.

I hope you enjoyed the 2017 Winnebago trawling report, if you have any questions or comments regarding the Winnebago trawling survey please contact me at the phone number or email listed below. Anyone interested in volunteering for the 2018 trawling survey should also contact me and we will try to get you on the schedule. The trawling survey could not be conducted without the help of our great volunteers and we are always looking for new volunteers to bring aboard the Calumet. Good luck fishing, be safe on the ice and water, and remember to take a kid or someone new out fishing in 2018!



Yearling freshwater drum, walleye, crappie, yellow perch, and gizzard shad sampled during 2017 October trawling



Local volunteers holding up some of the days catch during 2017 October trawling

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Table 1. List of trawling records for the primary young of year fish species sampled during the Lake Winnebago trawling survey (1986-2017).

Year	Freshwater Drum	White Bass	Walleye	Sauger	Yellow Perch	Black Crappie	Trout Perch	Emerald Shiner	Gizzard Shad
1986	32.9	10.8	0.1	0.0	0.1	1.2	1.8	0.0	1.6
1987	125.3	9.1	0.0	0.0	0.3	2.7	3.3	0.0	1.8
1988	107.6	43.1	0.1	0.1	0.2	5.1	9.6	0.2	54.3
1989	50.7	18.8	0.1	0.0	0.1	3.8	7.0	0.0	43.2
1990	122.3	90.9	2.9	0.4	0.3	3.3	108.8	0.2	44.3
1991	237.9	32.9	7.3	0.0	1.1	0.4	141.7	0.2	284.0
1992	7.1	8.2	0.8	0.0	0.4	0.3	93.8	0.0	1.8
1993	7.6	2.3	2.5	0.0	0.2	0.1	50.1	0.0	1.9
1994	49.4	19.1	0.1	0.0	0.2	0.6	129.1	0.0	1.7
1995	160.6	43.0	0.2	0.1	0.5	3.3	68.2	0.0	0.6
1996	55.5	169.1	23.7	0.0	0.4	0.1	226.9	0.2	0.3
1997	22.1	23.4	2.2	0.0	0.1	0.3	139.0	0.2	2.8
1998	122.6	10.4	2.5	0.0	0.3	1.1	169.7	0.2	0.1
1999	92.7	48.8	0.2	0.0	0.5	5.0	271.7	1.1	12.9
2000	107.7	11.7	0.3	0.0	0.1	0.3	258.2	0.8	11.4
2001	38.5	36.5	11.8	0.0	2.2	0.2	279.4	0.2	25.7
2002	186.4	18.8	1.9	0.1	2.1	2.3	391.8	0.3	114.8
2003	279.2	60.3	6.5	0.3	1.9	1.7	478.2	0.0	20.3
2004	61.7	17.8	8.8	0.4	6.9	0.7	307.6	0.1	3.2
2005	106.2	50.9	11.1	0.1	5.6	4.4	315.9	0.6	61.0
2006	87.0	23.0	2.4	0.1	5.4	1.0	569.0	0.3	12.5
2007	109.8	10.7	0.5	0.9	5.6	3.5	405.4	16.9	5.6
2008	52.8	50.2	17.5	0.4	2.2	0.5	341.8	1.1	2.9
2009	13.1	17.2	1.4	0.3	1.8	6.8	449.2	1.6	124.1
2010	83.2	15.0	0.9	0.2	1.4	11.4	335.2	1.3	197.2
2011	10.9	102.4	10.4	0.0	5.7	1.2	249.9	1.7	5.7
2012	212.2	36.7	0.2	0.0	1.0	3.1	133.6	5.5	122.6
2013	53.5	12.1	11.9	0.0	0.9	1.0	100.8	3.4	19.5
2014	14.2	0.2	0.4	0.0	0.1	0.2	94.2	0.2	11.4
2015	15.7	4.3	1.4	0.1	0.7	1.4	106.2	0.1	11.7
2016	93.0	17.6	9.9	0.0	2.3	24.1	359.8	3.5	102.4
2017	50.8	7.4	4.1	0.0	0.8	0.9	456.3	0.2	1.3
Average	86.6	32.0	4.5	0.1	1.6	2.9	220.4	1.3	40.8