2016 Lake Winnebago Bottom Trawling Assessment Report

Adam Nickel, Winnebago System Gamefish Biologist, January 2017

The 2016 Winnebago bottom trawling survey results are in and it was a great year to be on the boat as the survey revealed strong year classes for crappie, walleye, and forage base species. Over 36 volunteers (a mix of new and veteran) boarded the Calumet in 2016 and donated over 400 volunteer hours of labor. The bottom trawl assessment is the most critical fisheries assessment conducted on the Winnebago System and simply could not be conducted without the help of our dedicated volunteer base. 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 volunteers with a hands-on experience with conducting survey work on the system.

The same 46 GPS waypoints have been sampled annually during the first week of August, September, and October using standardized methods dating back to 1986. The standardized methods involve dragging a 27' wide bottom trawl on the lakebed for 5 minutes at 4 miles per hour, which equates to about a 1 acre sample area. The sampling gear does capture a fair amount of adult fish, but it is most effective at catching small fish (young of year (YOY) and yearlings). Therefore, this report will primarily focus on catch rates of YOY fish.

Trawling crew measuring a 70.0 inch lake sturgeon that was sampled during the October survey.

Walleye

The 2016 YOY walleye catch rate was 9.9/trawl, ranking as the 7th highest catch rate since 1986 (Figure 1). The 2016 catch rate was substantially higher than in 2014 (0.4/trawl) and 2015 (1.4/trawl), but comparable to strong year classes that occurred in 2011 and 2013. The strong 2016 year class can likely be attributed to the high spring water levels observed on the Wolf and upper Fox Rivers that led to favorable conditions on walleye spawning marshes. High spring water levels provide spawning adult walleye access to suitable habitat, while also providing adequate flows to keep eggs well aerated and flush out newly hatched fry. Besides having favorable water conditions, walleye fry also need a good available source of zooplankton for food to survive once they arrive in the upper pool lakes. Walleye fry survive off their yolk sac during their first few days of life; however, once the yolk sac is absorbed their survival is dependent on having a well-timed zooplankton hatch. Ultimately, Mother Nature is the major driving force that dictates spring water levels, zooplankton availability, and other factors that drive walleye year class strength on the system.

Although the Winnebago System experienced weak walleye year classes in 2014 and 2015, strong year classes from 2008, 2011, and 2013 continue to fuel a robust walleye fishery. Favorable growing conditions (extended growing season and abundant forage) resulted in good growth of fish from the 2016 year class (average length 6.9”), but this year class likely won’t contribute to the fishery for another 2-3 years. Nearly 100% of male walleye reach maturity at age 3, thus males from the 2016 year class will make their first spawning run in 2019. Female walleye typically reach maturity between 4-6 years of age (~30% mature at age 4, 82% by age 5, and 99% by age 6), thus females from the 2016 year class will spawn for the first time between 2020-2022. Although it will still take some time for females from this year class to reach maturity, the majority of the 2013 females will mature and make their first spawning run in 2018. Stay tuned for the 2016 Winnebago walleye report for more details.

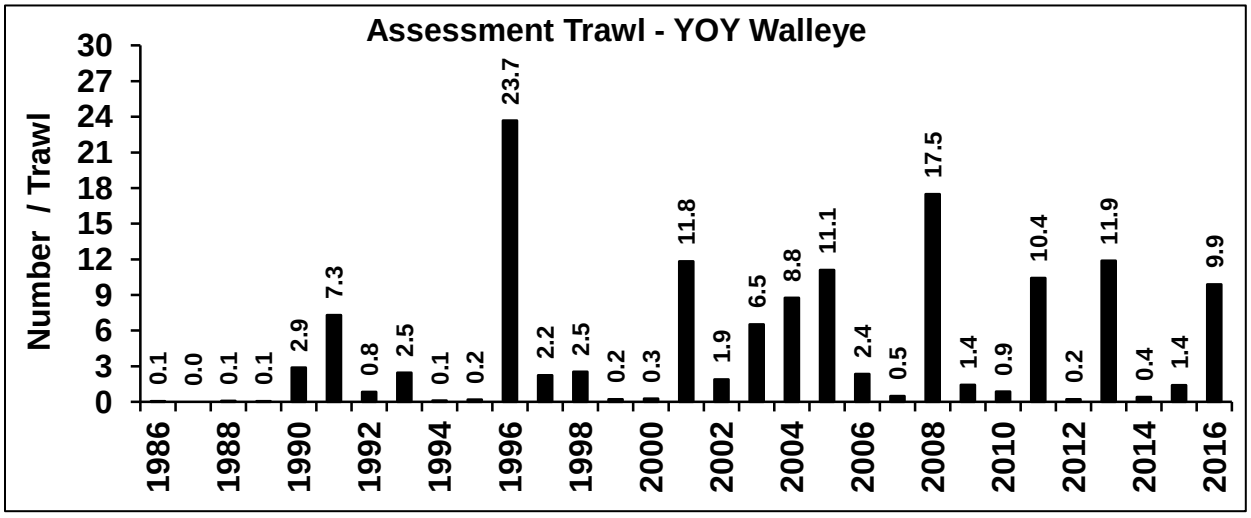

Figure 1. Average number of YOY walleye/trawl in Lake Winnebago from 1986-2016.

Sauger

A sauger rehabilitation program that aimed to rebuild the Lake Winnebago adult sauger population and bolster natural reproduction was conducted on Lake Winnebago from 2001-2010. The project included a number of facets including installation of rock reefs to improve sauger spawning habitat and intensive stocking (7,998,000 fry, 10,000 fingerlings, and 6,576 extended growth fingerling in the Winnebago System). As a result, the number of YOY sauger sampled during annual trawl surveys increased during 2001-2010 (Figure 2) and the stocking program was successful at increasing adult sauger numbers, with adult sauger catch rates increasing from 0.24/trawl in 2001 to 2.49/trawl in 2010 (Table 1). Stocking efforts ceased in 2010 to allow for an evaluation period to determine whether increased adult abundance would result in more natural reproduction observed via annual bottom trawl surveys.

Since stocking ceased only 15 YOY saugers have been sampled and adult sauger numbers have also declined, averaging 0.75/trawl in 2016. The 2016 catch rate of YOY sauger was 0.02/trawl, indicating a weak year class. Although the presence of YOY sauger indicate that some natural reproduction is occurring, catch rates and year class strength continue to be low. As a result, the adult sauger population will likely continue to be present, but at lower densities similar to what was present prior to the 2001-2010 stockings.

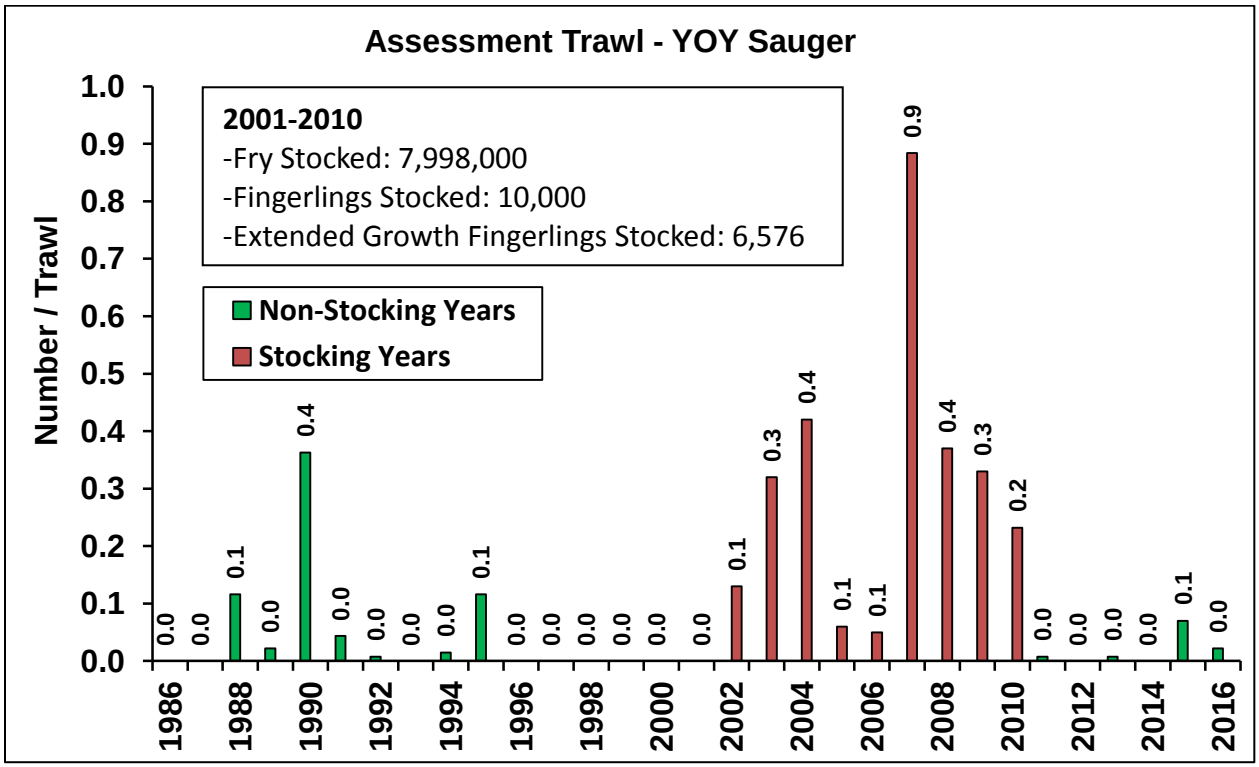

Figure 2. Average number of YOY sauger/trawl in Lake Winnebago from 1986-2016 with red bars indicating years that stocking occurred and green bars indicating years when stocking was not conducted.

Crappie

One of the highlights of the 2016 survey was the YOY crappie catch, averaging 24.1/trawl and ranking as the highest catch rate on record. The 2016 hatch was substantially greater than the historical average of 2.9/trawl and more than doubled the previous highest ranked catch of 11.4/trawl in 2010 (Figure 3). The strong crappie year classes from 2009 and 2010 continue to dominate the adult population and provide good fishing opportunities, but these dominant year classes will continue to fade out of the adult population in coming years. Fortunately, the phenomenal 2016 year class will make up for the below average catches from 2011-2015 and should provide some superb fishing opportunities in the future.

Similar to walleye, environmental conditions and habitat are the main factors driving crappie recruitment. In particular, vegetation appears to be a major habitat component that drives crappie year class strength on the system. Crappies are a nest building species, thus vegetation provides both cover and material for nest construction during the spring spawning period. More importantly, vegetation provides cover for fry and juvenile fish to escape predation. Increasing water clarity during the mid-late 2000s led to improved vegetation growth throughout the system, which coincided with the strong 2009 and 2010 crappie hatches. Anecdotal reports from 2016 indicated that the system experienced some of the best vegetation growth noted since the late 2000's. Nonetheless, it will be interesting to see how habitat trends and crappie year class strength emerge in the future.

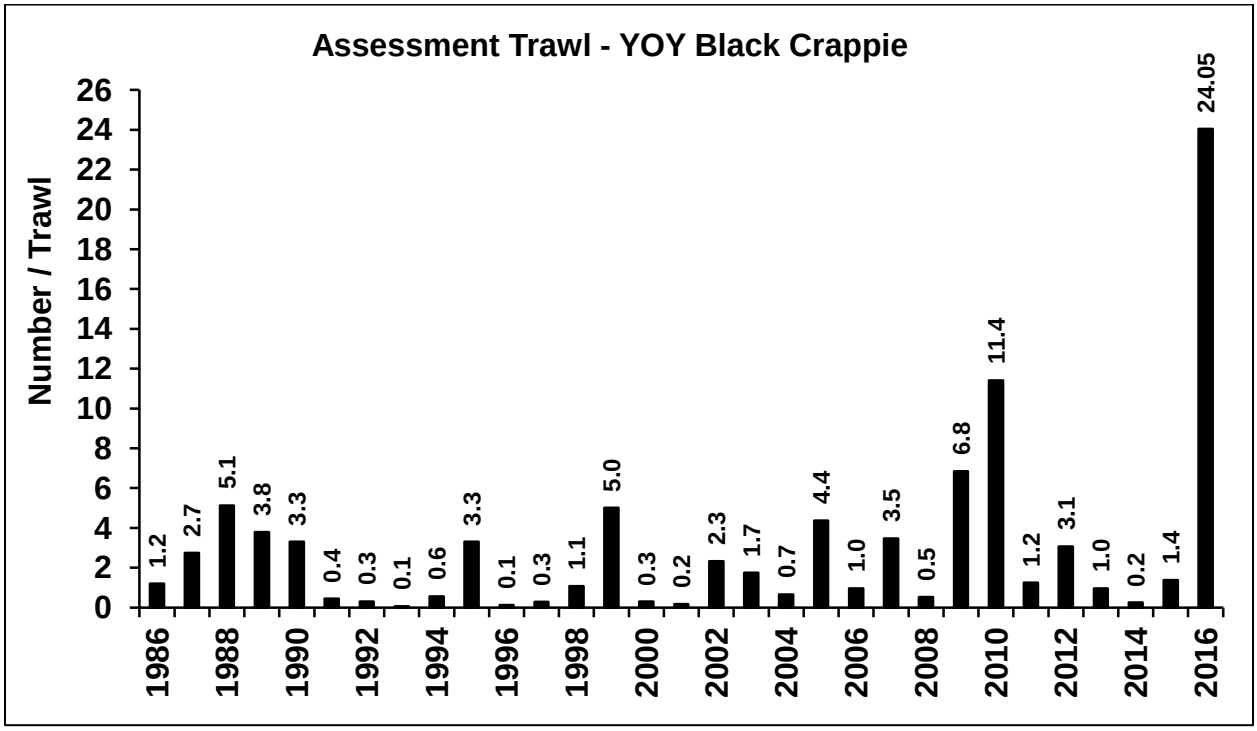

Figure 3. Average number of YOY black crappie/trawl in Lake Winnebago from 1986-2016.

Yellow Perch

The 2016 YOY yellow perch catch averaged 2.3/trawl, ranking slightly above the historical average of 1.6/trawl (Figure 4). Although 2016 wasn't a top-ranking year class, it will be documented as a measureable year class and the highest catch since 2011 (5.7/trawl). In addition, the catch rate during the month of October was 3.7/trawl, ranking as the third highest October catch since 1986. Anglers also had some encouraging news, indicating that there was some productive fishing for nice sized perch (8-11 inches) during the latter part of summer into fall. Therefore, it is possible that the trend of difficult yellow perch fishing could take a more positive turn in the future. A more detailed yellow perch report was completed in July of 2016, contact Ryan Koenigs (Ryan.koenigs@wisconsin.gov) if you are interested in receiving that report.

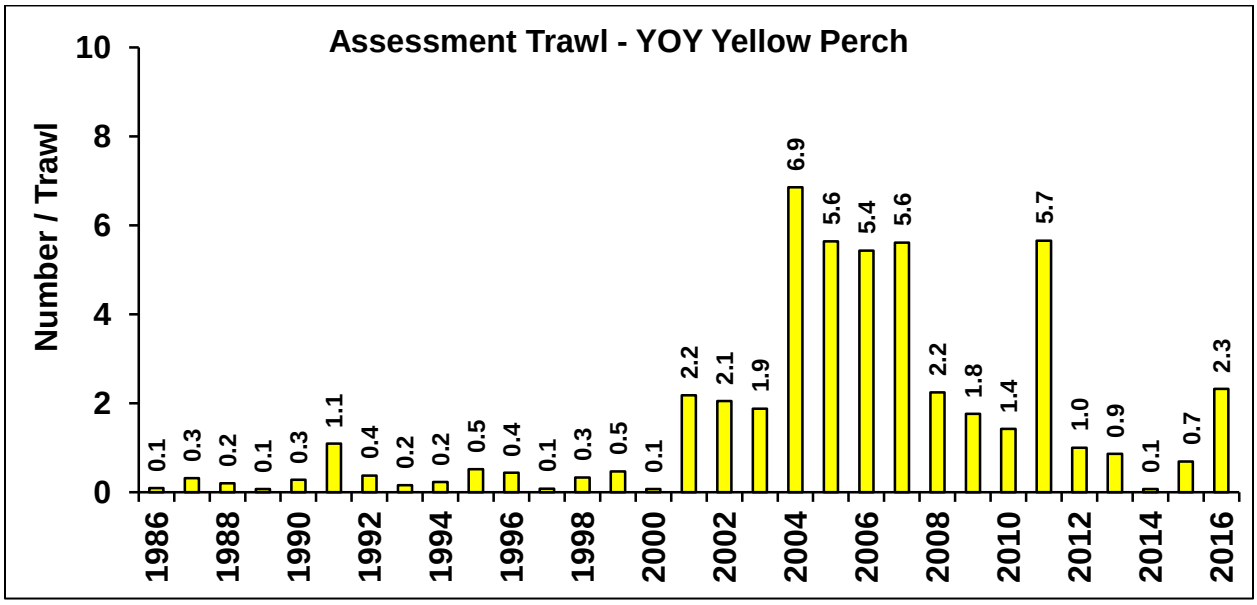

Figure 4. Average number of YOY yellow perch/trawl in Lake Winnebago from 1986-2016.

White Bass

White bass continue to be a dominant species sampled in bottom trawl surveys averaging 32.8 YOY/trawl since 1986 (Figure 5). Although the 2016 YOY white bass catch rate of 17.6/trawl was below the historical average, it ranks as the highest catch noted since 2012. The strong 2011 year class (2nd largest on record; averaged 102.4/trawl) and above average 2012 year class continue to drive the fishery and provide quality angling opportunities. Although these strong year classes will begin to fade from the population, the measureable 2016 year class should help to provide additional white bass fishing opportunities in the future.

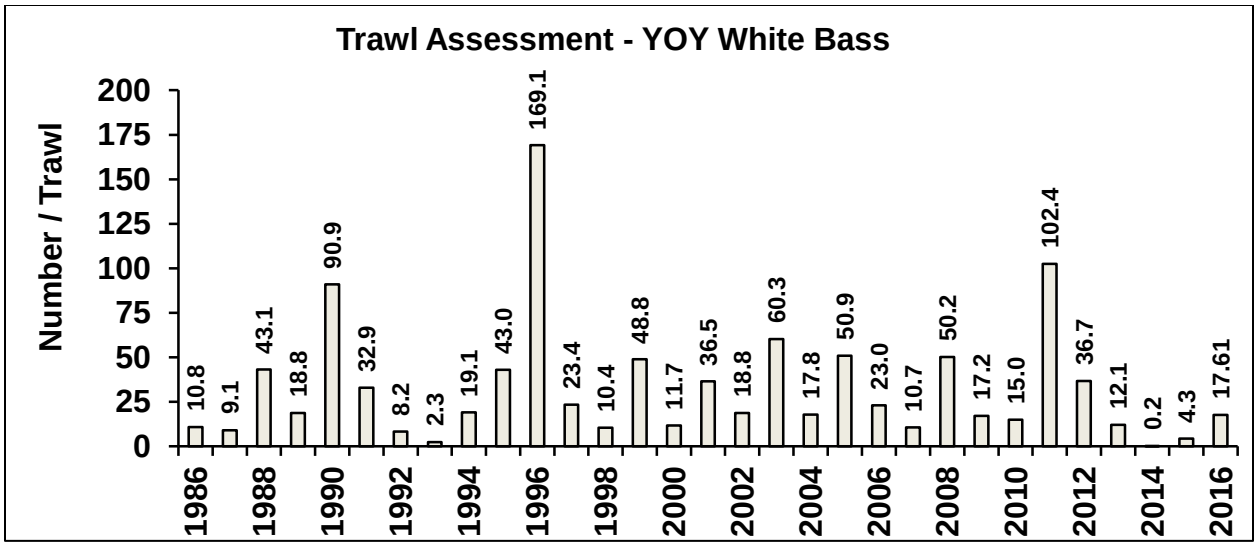

Figure 5. Average number of YOY white bass/trawl in Lake Winnebago from 1986-2016.

Forage Fish Species

One of the main highpoints of the 2016 survey was the rebound in YOY trout perch numbers as the average catch of 359.8/trawl surpasses the historical average catch rate of 212.8/trawl. Although many anglers have never seen a trout perch, they are a staple diet item for many gamefish and panfish species. Besides their sheer abundance, the small size of YOY trout perch provides important forage for other larger juvenile species, particularly walleye. Although YOY trout perch experienced sharp declines from 2010-2012 (Figure 6), it appears that adult trout perch still have the ability to pull off large hatches with the right environmental conditions. Trout perch will continue to play a key role in maintaining a stable forage base and sport fishery, thus the rebound in numbers is greatly welcomed.

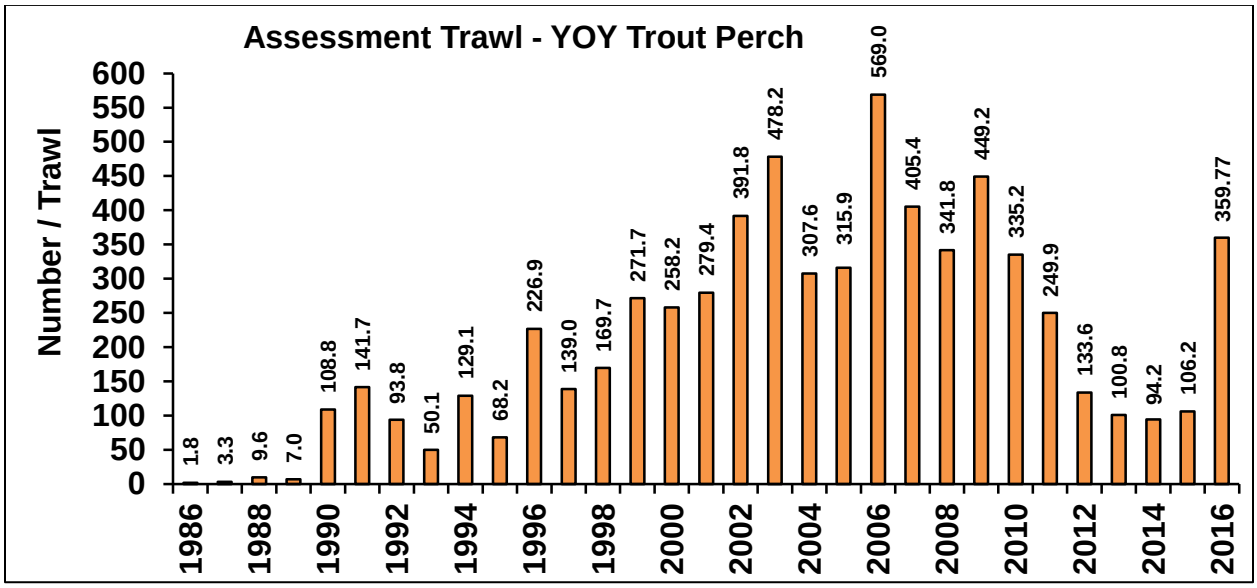

Figure 6. Average number of YOY trout perch/trawl in Lake Winnebago from 1986-2016.

Gizzard shad are another important forage fish found in the Winnebago System, but are notorious for boom and bust recruitment cycles. Anglers throughout the system are well aware of how gamefish species, particularly northern pike and walleye, can become tight lipped following a strong shad hatch. For example, the strong year classes of gizzard shad observed in 2009 (124.1/trawl) and 2010 (197.2/trawl) coincided with a significant decrease in estimated adult female walleye exploitation from 55.1% in 2009 (pre-shad hatch) to 20.6% in 2010 and 9.2% in 2011 (post-shad hatch). The 2016 trawl survey revealed a catch rate of 102.4 YOY gizzard shad/trawl, ranking as the 6th strongest hatch since 1986 (Figure 7). Anecdotal reports also indicated a fair number of shad on the Upriver Lakes throughout the summer, thus it would appear that a fairly strong hatch occurred system-wide. Therefore, gamefish on the system may be more tightly lipped this year and anglers may need to spend some additional time on the water to produce fish.

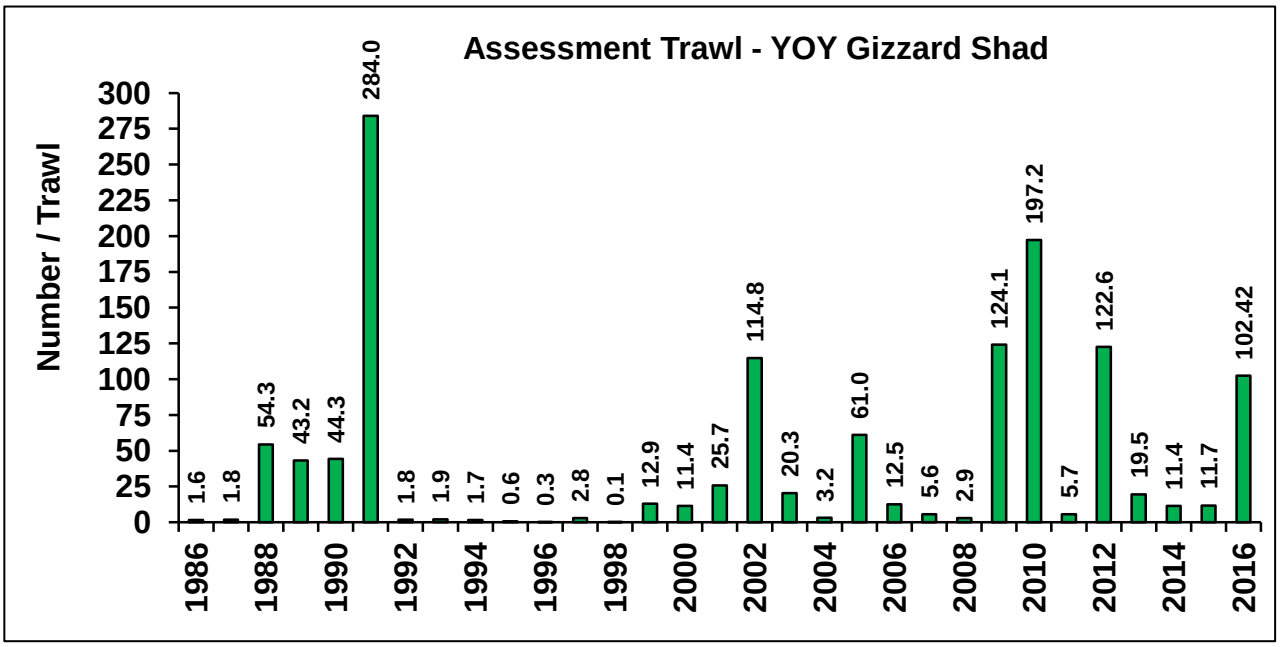

Figure 7. Average number of YOY gizzard shad/trawl in Lake Winnebago from 1986-2016.

Although often overlooked, YOY freshwater drum are also an important forage item within the systems food web. Unlike the boom and bust nature of gizzard shad, measureable year classes of freshwater drum are often produced annually which helps add some stability to the forage base. The 2016 YOY freshwater drum catch of 93.0/trawl was comparable to the historical average of 87.7/trawl. Overall, the cumulative average catch for trout perch, gizzard shad, and freshwater drum was 555.2/trawl, making 2016 the highest catch noted since 2010 (Figure 8). In addition, the 2016 YOY emerald shiner catch rate was 3.5/trawl, ranking as the 3rd highest catch since 1986. The strong year classes of multiple forage species should help to provide more stability in the forage base and produce some plump fish for anglers in 2017.

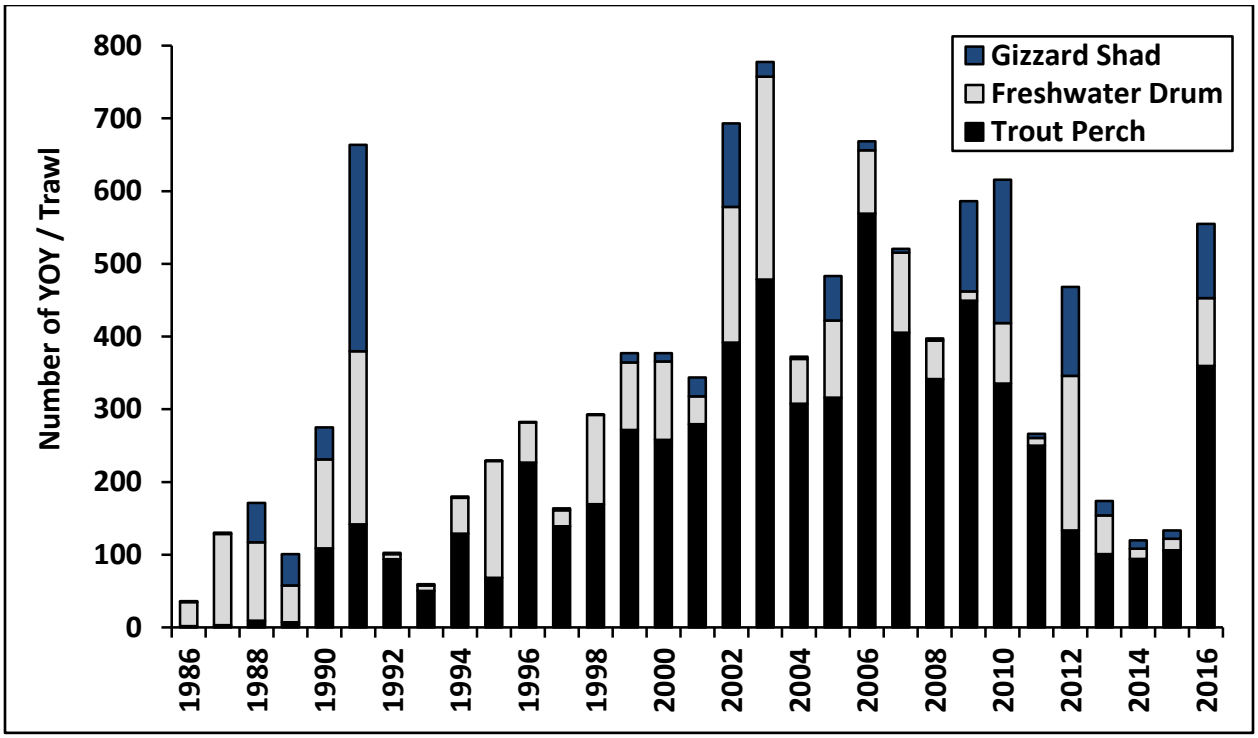

Figure 8. Average number of YOY trout perch (black bars), freshwater drum (gray bars), and gizzard shad (blue bars)/trawl in Lake Winnebago from 1986-2016.

I hope you enjoyed this year's 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 2017 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 2017!

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Table 1. List of trawling records for young of year fish species sampled during the 2016 Lake Winnebago trawling survey.

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
Average	87.7	32.8	4.5	0.1	1.6	2.9	212.8	1.3	42.0