

2018 Lake Winnebago Bottom Trawling Assessment Report

Adam Nickel, Winnebago System Gamefish Biologist, January 2019

The Lake Winnebago bottom trawling assessment continues to be one of the most critical fisheries assessments conducted on the Winnebago System. As DNR staff and a host of volunteers boarded the Calumet in 2018 one of the big questions was how the historic 2018 spring snow storm would impact recruitment of various fish species within the Winnebago System, particularly walleye. A mid-April weekend snow storm that brought more than 30 inches of snow to some areas spurred dramatic changes in water levels throughout the basin. What began as a record dry spring quickly turned into record high water levels on the Wolf River as snow melted away. The 2018 trawling results revealed a few highlights including a measurable walleye hatch, strong catches of adult panfish, and record low catches of adult freshwater drum.

Another highlight of the 2018 survey was the continued support from local volunteers who are the driving force behind successfully completing the trawling survey. In fact, there are more than 400 volunteer hours that go into completing the survey each year to meet survey objectives. The main 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, and 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 Winnebago System.



Trawling crew including Don Chrapla (volunteer), Larry Propson (volunteer), Jason Kohls (DNR staff), Scott Stankowski (volunteer), Dave Boyarski (DNR staff), and Dennis Cook (volunteer; left to right) showcasing the various fish species sampled during October trawling on Lake Winnebago.

The survey consists of sampling 46 standardized GPS waypoints during the first week of August, September, and October. Each sampling event involves towing a 27' wide trawl 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 annually 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 on the Winnebago System.

Walleye

Despite varying water level conditions on the Wolf River in 2018, the trawling results indicated that a measurable walleye year class was produced. Although mid-April is often already past the peak walleye spawn in most springs, it appears that the high water levels produced from the snow storm still provided viable conditions for some walleye spawning success. The 2018 YOY walleye catch rate of 5.1/trawl was just above the long-term average of 4.5/trawl (Figure 1). The catch rate of 2.8 yearling walleye/trawl indicates strong survival from the 2017 year class (4.1 YOY/trawl). Therefore, the measurable 2017 and 2018 year classes should contribute to the adult population in future years.

The strong 2016 year class (9.9 YOY/trawl, ranked 7th since 1986) was also well represented in the survey with fish measuring 11-13 inches during the October trawling. The strong 2016 year class is poised to contribute to the adult population and fishery in the near future. In fact, nearly 100% of males mature by age 3, meaning that males from this year class should 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). Therefore, it will take a few more years for the 2016 cohort of female walleye to make their first spawning runs. Stay tuned for the 2018 Winnebago walleye report for more details regarding the overall walleye population and fishery.



Images of YOY walleye ranging 5.0-8.0 inches (left) and a net full of 2016 year class walleye ranging 11-13 inches (right) that were sampled during October trawling on Lake Winnebago.

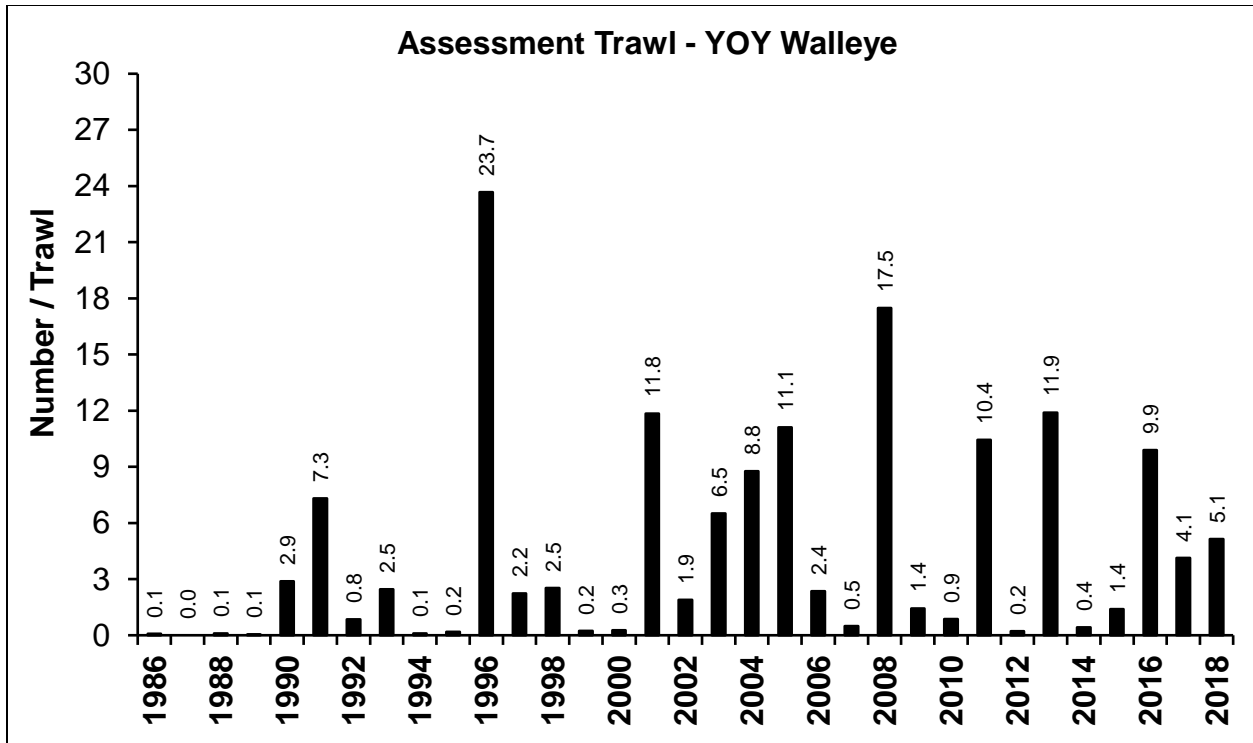


Figure 1. Average number of YOY walleye/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Yellow Perch

The 2018 bottom trawl assessment indicated that it was a strong year for yellow perch on the Winnebago System. The observed catch rate of 3.5 YOY/trawl is well above the long-term average of 1.6/trawl and is the highest catch rate observed since 2011 (5.7/trawl; Figure 2). There also was a respectable catch rate for adult yellow perch (6.7/trawl), ranking as the 6th highest catch rate since 1986 (Figure 2). The high adult perch catch rate was attributed to the measurable 2016 year class (2.3 YOY/trawl) that provided good angling opportunities during the summer of 2018 that may continue into 2019. The 2018 yellow perch year class should contribute to the population and fishery in future years as well. Contact Ryan Koenigs (Ryan.koenigs@wisconsin.gov) if you have any specific questions related to yellow perch assessment or management on the Winnebago System.



Net full of yellow perch sampled during October trawling

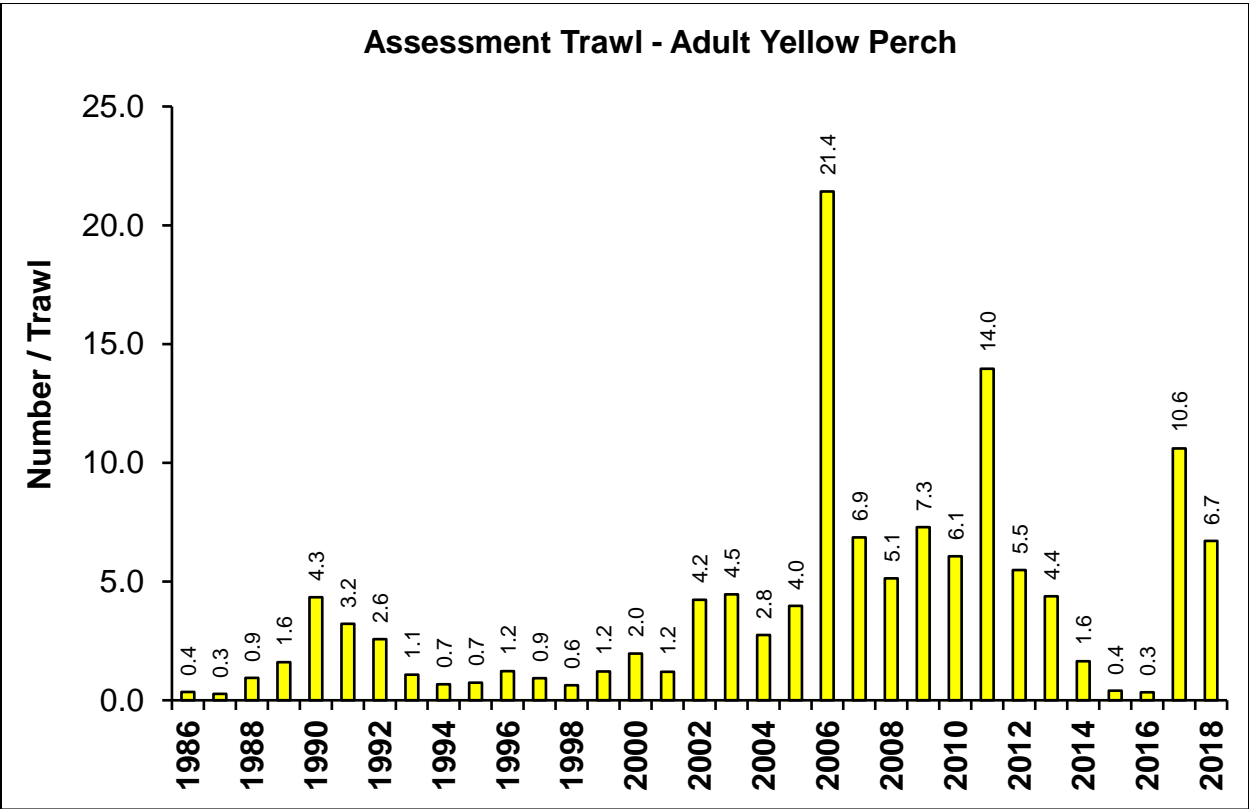
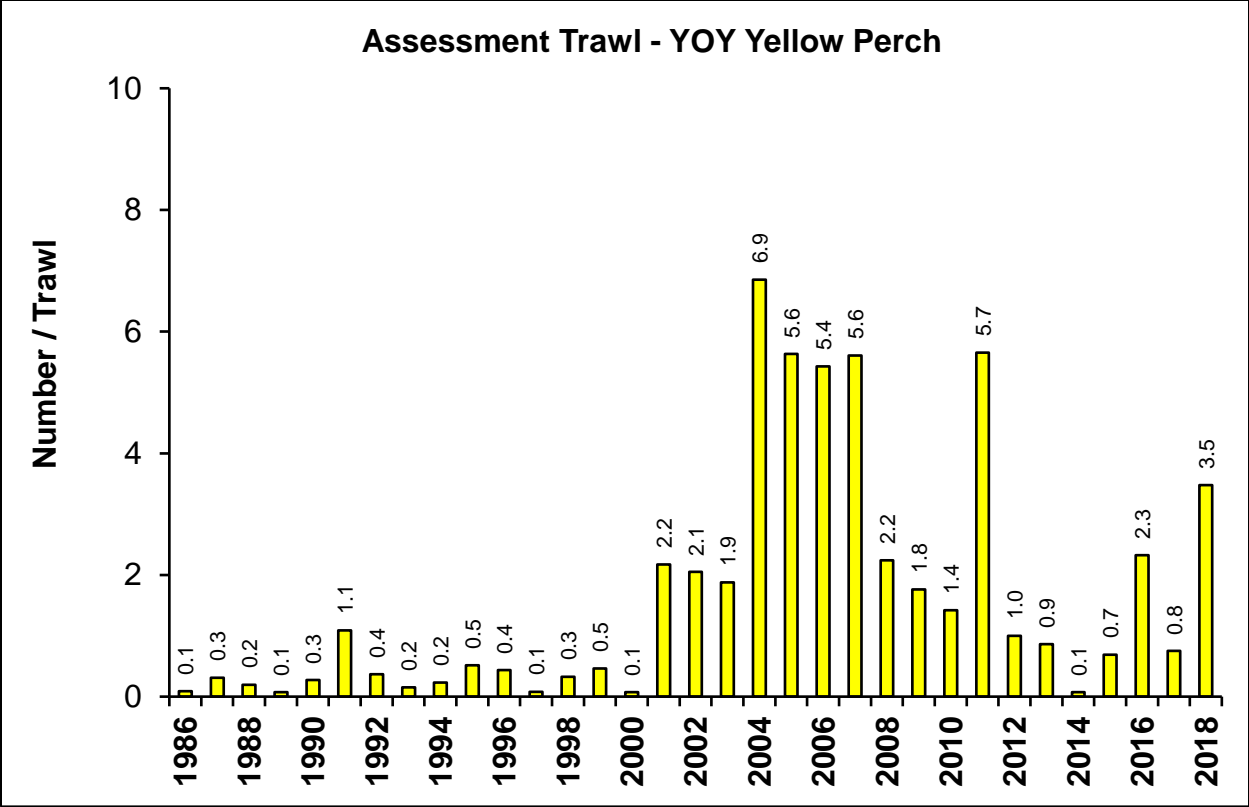


Figure 2. Average number of adult yellow perch/trawl (lower panel) and YOY yellow perch/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Crappie

The 2018 hatch of black crappie appears to be weak based on bottom trawl results of 2.1 YOY crappie/trawl (Figure 3). The record year class from 2016 (24.1 YOY/trawl) should provide a boost to the adult population and provide anglers with some keeper sized crappies in 2019. However, it should be noted that the adult crappie catch rate decreased from 7.8/trawl (primarily yearlings) in 2017 to 1.1/trawl in 2018 (Figure 4). The same trend was documented in 2011 when adult catch decreased from 21.8/trawl (primarily yearlings) to 5.1/trawl in 2012. The factors contributing to substantial declines in catch rates from the yearling stage to age 2 are unknown. However, potential sources include poor survival, increased ability to escape the trawl at age 2, or changes in habitat use. For example, crappie fishing was superb on the system in 2016 despite having low adult crappie catch rates on the trawl (0.4/trawl). Nonetheless, it will be interesting to see how productive crappie fishing will be on the system in 2019.

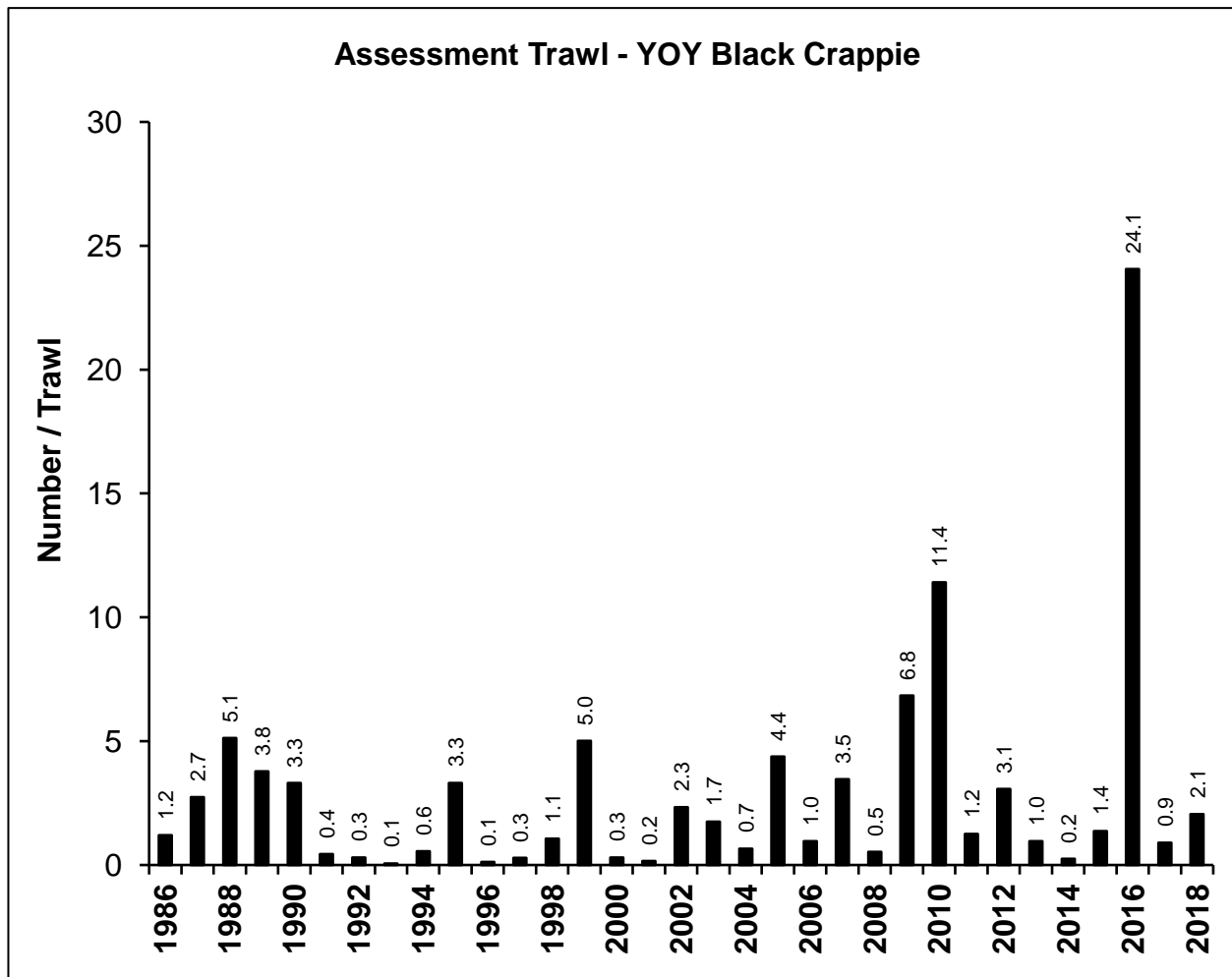


Figure 3. Average number of YOY black crappie/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

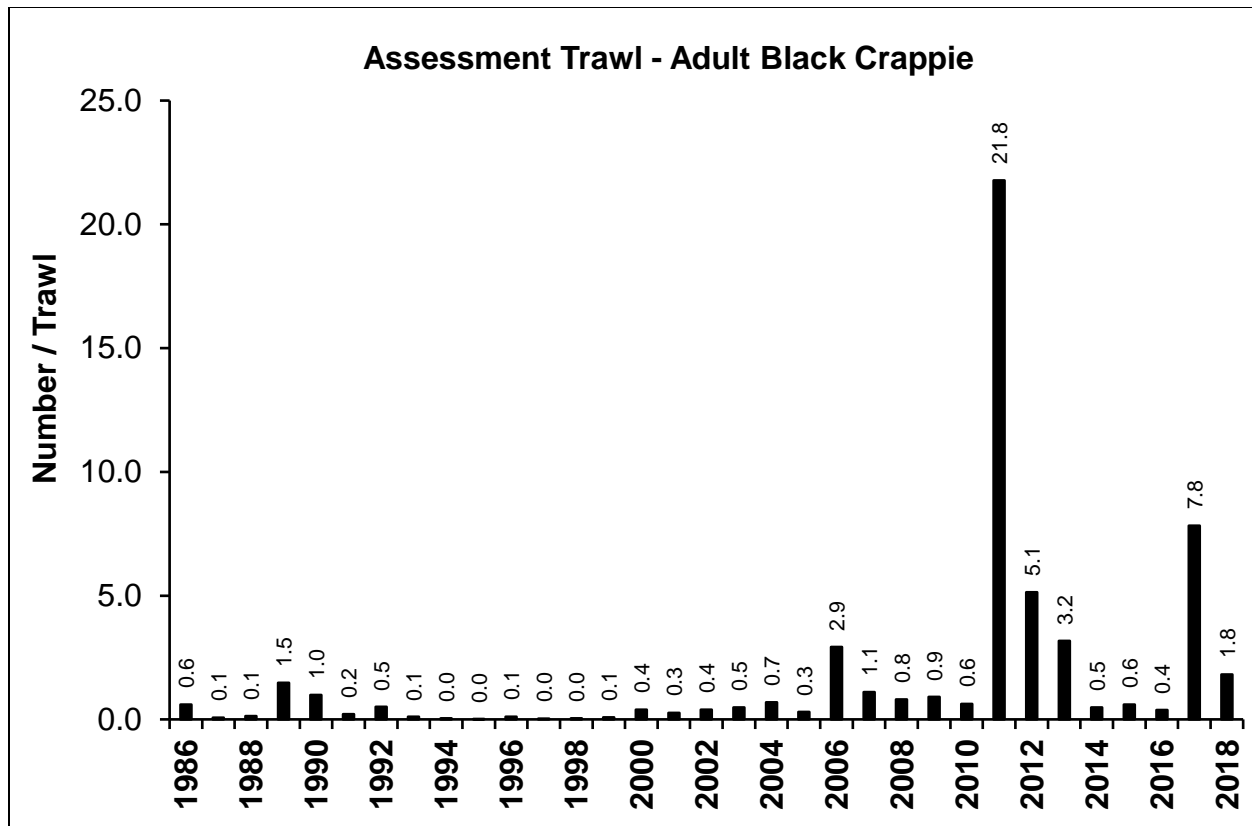


Figure 4. Average number of adult black crappie/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

White Bass

White bass are an important sport fish species in the Winnebago System, particularly in spring and winter. In addition to the fisheries value, early life stages of white bass also contribute to the forage base. The catch rate of 0.8 YOY white bass/trawl observed in 2018 was well below the long-term average of 32.0/trawl (Figure 5). The strong 2011 year class (2nd largest on record; averaged 102.4/trawl) and the above average 2012 year class have dominated the adult white bass population in recent years. However, some anglers reported that white bass were tough to find in 2018, particularly during the famous spring river run. Environmental conditions such as water levels and forage trends can affect fishing success but having strong year classes is critical for providing a quality fishery. As the 2011 and 2012 year classes fade from the adult population, the fishery will depend on more recent year classes. The catch rate for adult white bass during 2018 sampling was 5.0/trawl, which was the highest adult catch rate since 2013 (Figure 5). The majority of adults sampled ranged in size from 11-12 inches, which could be from the measurable 2016 year class (17.6 YOY/trawl). Therefore, it will be interesting to see if anglers find better white bass fishing opportunities in 2019.

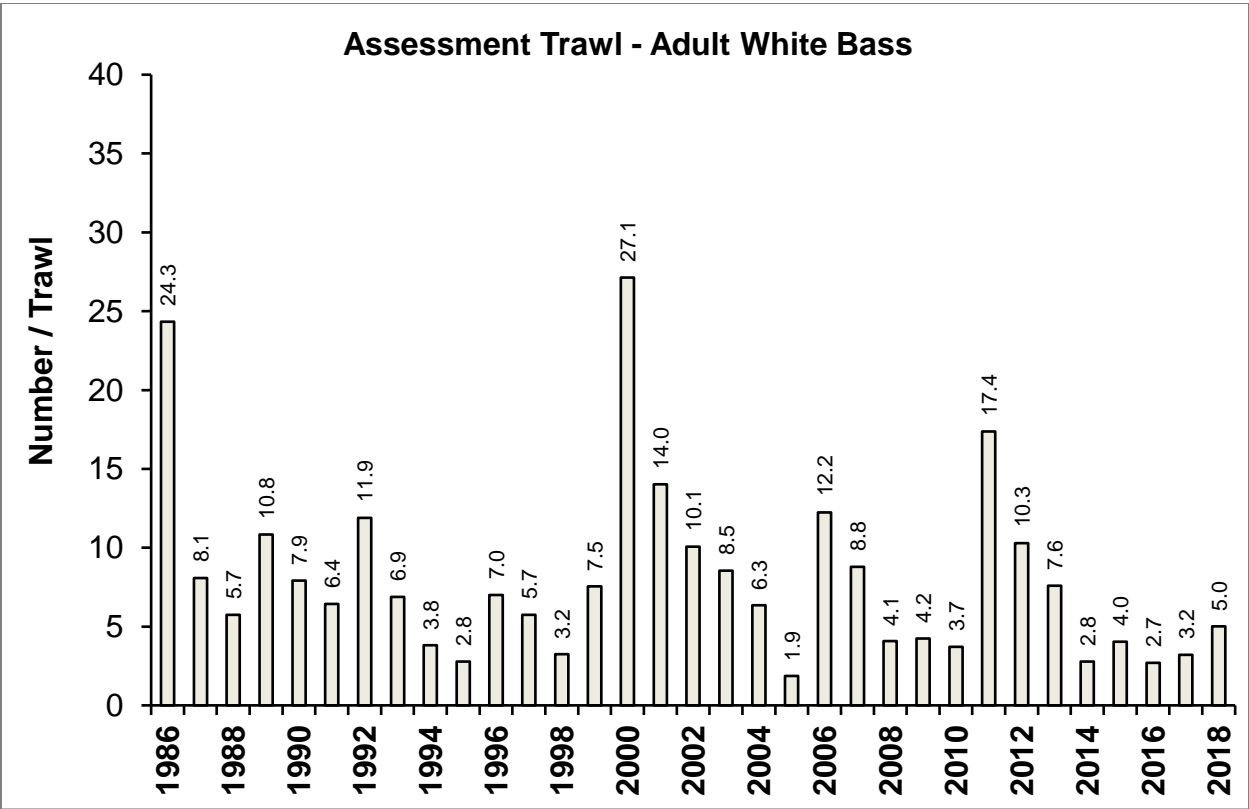
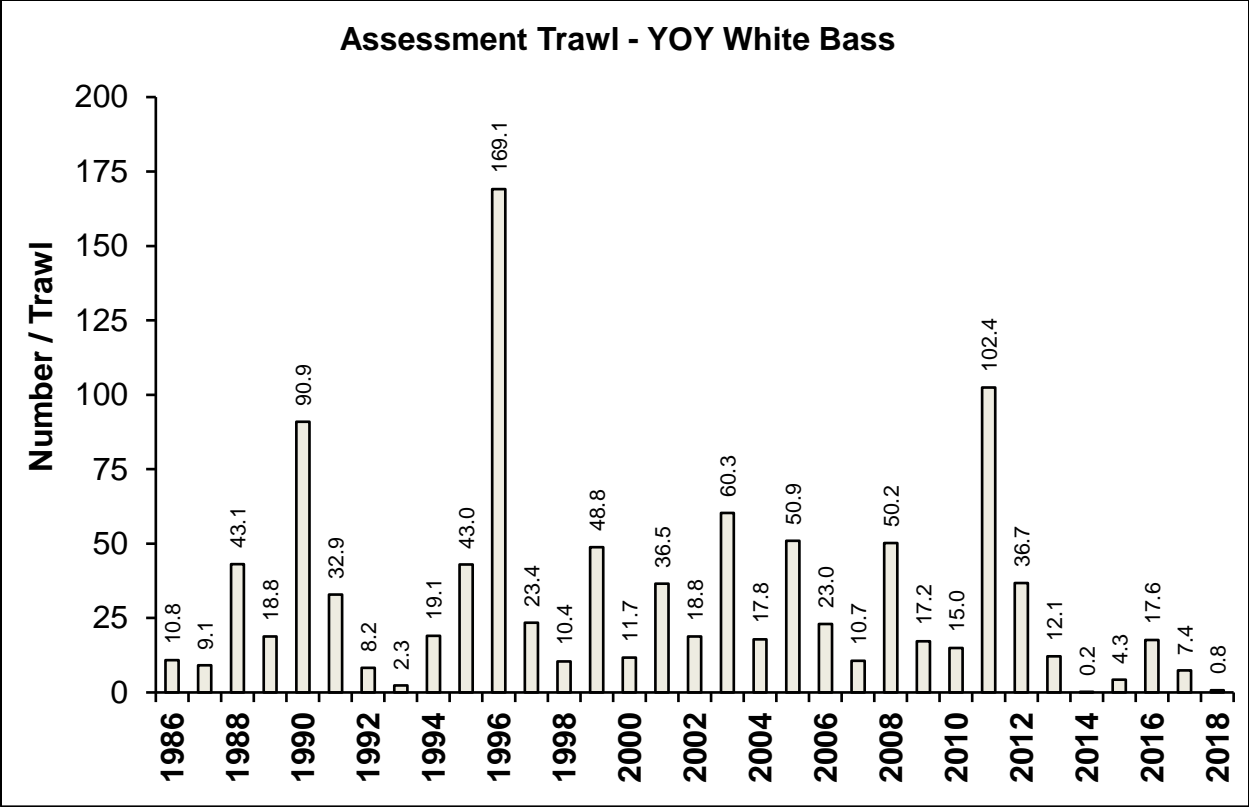


Figure 5. Average number of adult white bass/trawl (lower panel) and YOY white bass/trawl (upper panel) captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Forage Fish Species

Trout Perch

Trout perch are a staple forage item for many gamefish species on the system. One of the highlights of trawling survey over the last few years has been the resurgence of YOY trout perch catch rates, particularly in 2016 (359.8/trawl) and 2017 (456.3/trawl). The 2018 YOY trout perch catch rate of 206.3/trawl was just below the long-term average of 220.0/trawl (Figure 6). Despite the decrease in catch during 2018, there has been an overall increase in trout perch numbers since the low catches observed between 2012-2015.

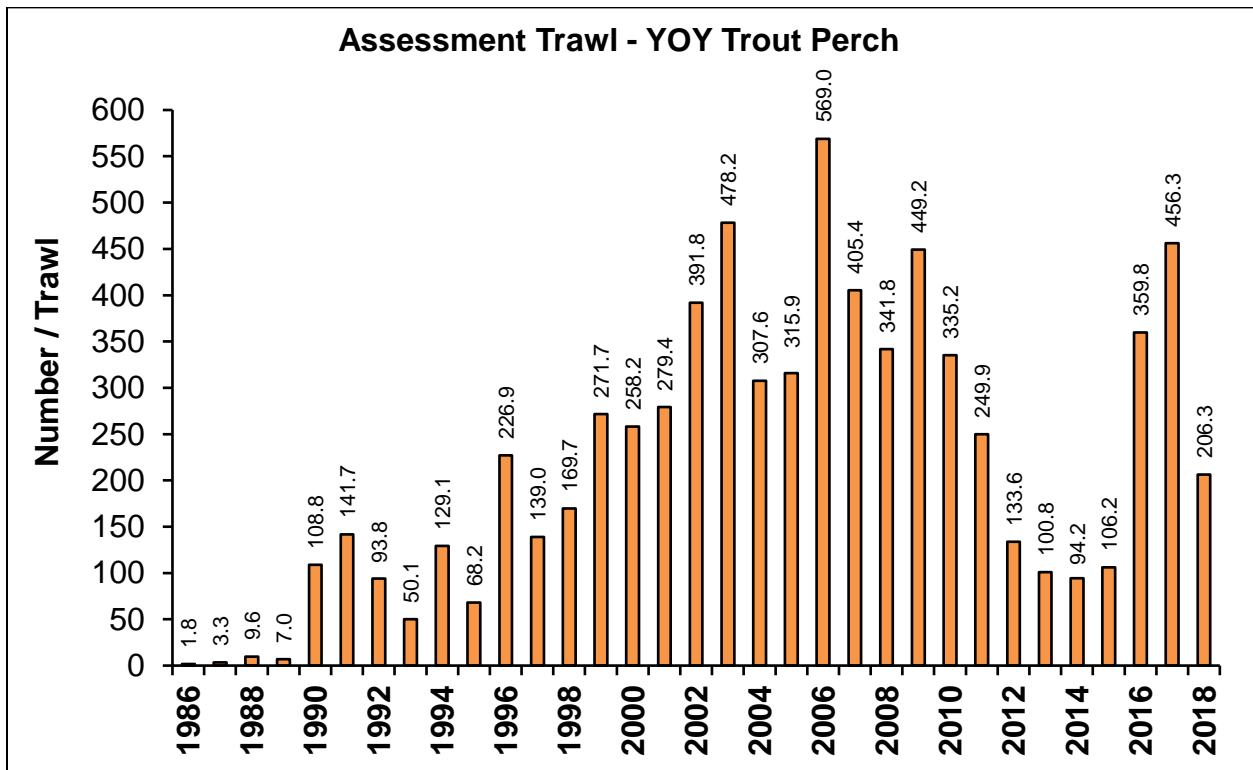


Figure 6. Average number of YOY trout perch/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Gizzard Shad

How was the gizzard shad hatch this year? That's often one of the first questions anglers ask when the trawling survey is completed each year. Gizzard shad are known for their boom or bust recruitment cycles and can often drive fishing success for gamefish species on the system. Boom year classes of gizzard shad can saturate the forage base with natural forage, contributing to increased fish condition and decreased angling success. Even sturgeon key in on dead or dying gizzard shad during the winter months. The 2018 trawling survey indicated a weak gizzard shad hatch with a catch rate of 0.4 YOY/trawl, that was similar to 2017 (1.3

YOY/trawl; Figure 7). The weak shad hatch in 2017 contributed to superb ice fishing opportunities for walleye throughout the system during the 2017-18 winter, with some anglers stating that it was the best year of winter walleye fishing they could remember. With another weak shad hatch in 2018, anglers could be in for another productive year of walleye fishing on the system. Anglers may also find some good northern pike angling opportunities, particularly through the ice on the Upriver Lakes. Nonetheless, it will be interesting to see how the 2019 walleye and northern pike bite compares to years past.

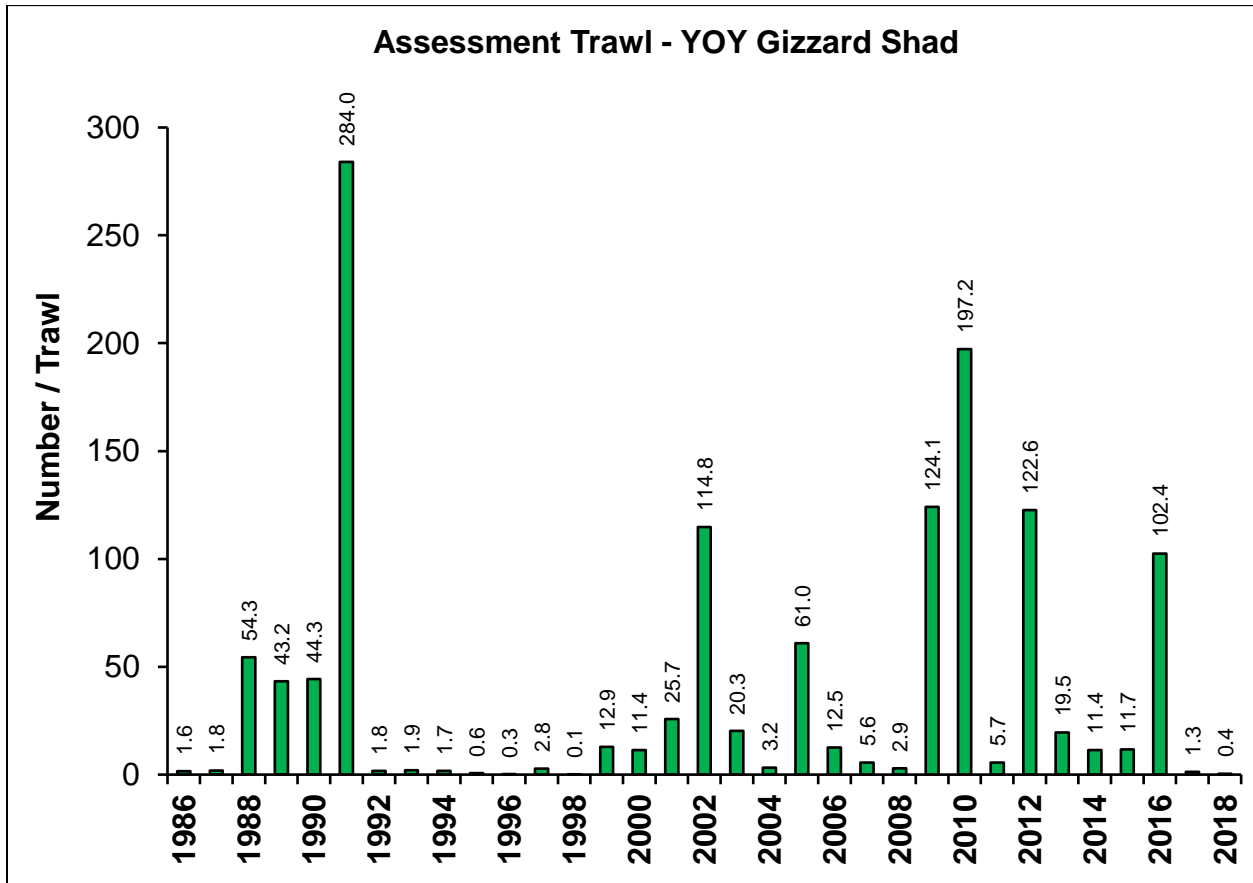


Figure 7. Average number of YOY gizzard shad/trawl captured during fall bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Freshwater Drum

Adult freshwater drum, also known as sheepshead, were on the minds of many lakeshore property owners during the spring of 2018. Reports of dead fish that primarily consisted of adult freshwater drum first surfaced in the Fond du Lac area on April 24th. Additional reports followed around the lake in late April and early May. Other species including black crappie, yellow perch, bluegill, and largemouth bass were also noted, but in low numbers. During the die-off, DNR staff collected 58 dead or dying freshwater drum, 7 black crappie, 1 yellow perch, 1 bluegill, and 1 largemouth bass from various locations around Lake Winnebago.

The fish were taken to the U.S. Fish and Wildlife Service laboratory near La Crosse for testing and results later indicated that all fish processed tested positive for viral hemorrhagic septicemia (VHS). Freshwater drum was the species most impacted by the VHS kill, while impacts on gamefish species appeared to be limited based on the amount of dead fish observed around the lake.

Adult freshwater drum often dominate the trawling catch and numbers have been stable since the survey began in 1986 (average catch rate of 482.8/rawl; Figure 8). In 2017, the adult catch rate was 734.5/rawl, which ranked as the 2nd highest catch rate since 1986. The high catch rate was partly attributable to a strong contribution of yearling fish from the 2016 year class. However, the adult freshwater drum catch rate hit a record low of 230.1/rawl in 2018, which represents a 68.7% decrease from 2017. Therefore, the spring VHS kill appears to have resulted in a substantial decrease in abundance of adult freshwater drum in Lake Winnebago.

Many anglers have asked why VHS was more prevalent this year and why adult freshwater drum were impacted the most. Since the first VHS outbreak on the Winnebago System in spring of 2007, the occurrence of VHS related fish kills has been fairly low and unsubstantial. However, it appears that the late winter and weather conditions during the spring of 2018 led to favorable conditions for the virus. The virus is most active between water temperatures of 38-54° F and becomes inactive once temperatures surpass 68° F. Although we will never know exactly why adult freshwater drum were impacted the most by the virus, there are a few plausible explanations. For starters, adult freshwater drum abundance is high, particularly in 2017. The high abundance may have led to increased competition for resources and lower overall fish condition heading into the spring making adult drum more susceptible to stressors such as VHS. There has also been research suggesting that fish may build immunity to the VHS virus after exposure. Therefore, it is possible that the large 2016 year class of freshwater drum may have provided a source of drum that were naïve to the virus and thus more susceptible.

Although adult freshwater drum catch rates were lower than the long-term average, fish populations often respond to substantial population declines by increasing recruitment to boost the population. Despite the large die-off in the spring, freshwater drum still produced a measurable year class in 2018 with a YOY catch rate of 23.0/rawl. Although freshwater drum are often overlooked or viewed negatively on the system, their early life stages are an important forage item for gamefish species, including walleye. Unlike the boom and bust nature of gizzard shad, measurable year classes of freshwater drum are produced annually providing stability to the forage base. Nonetheless, it will be interesting to track the freshwater drum population and their response to the die-off over the next few trawling assessments.

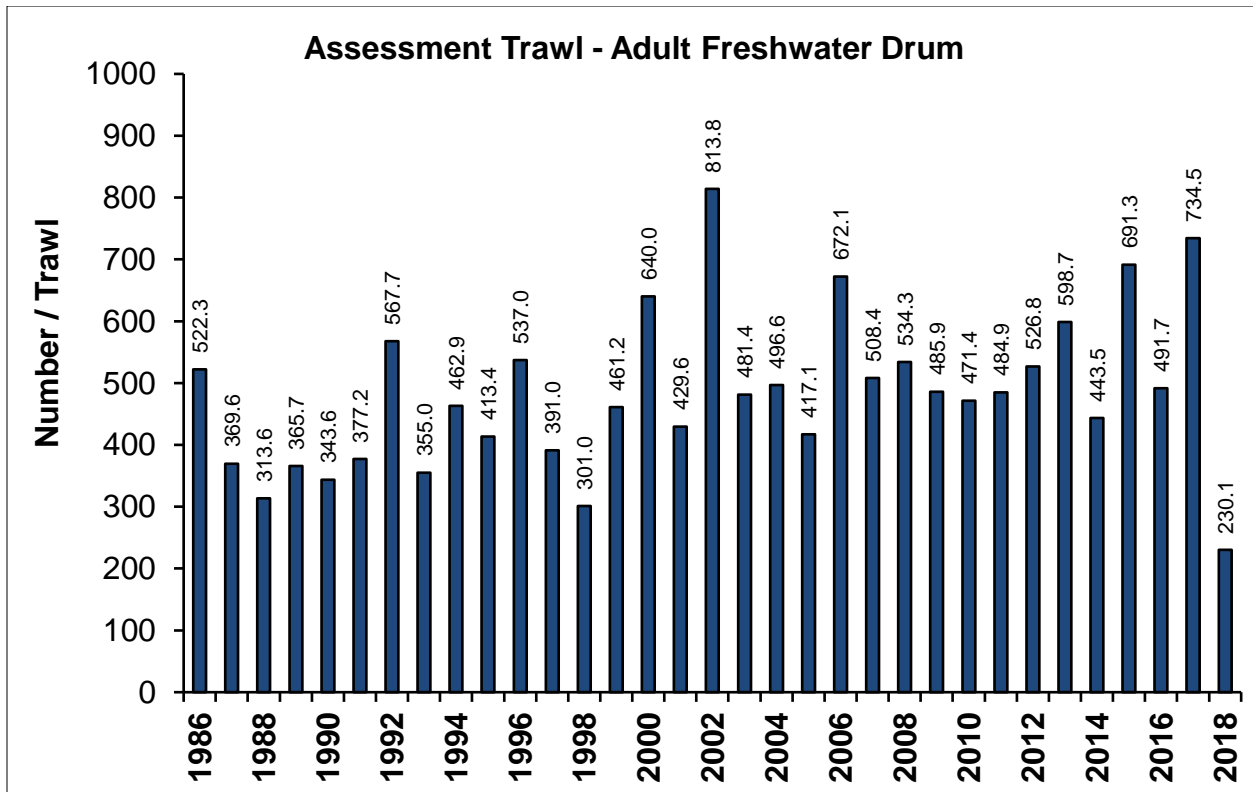
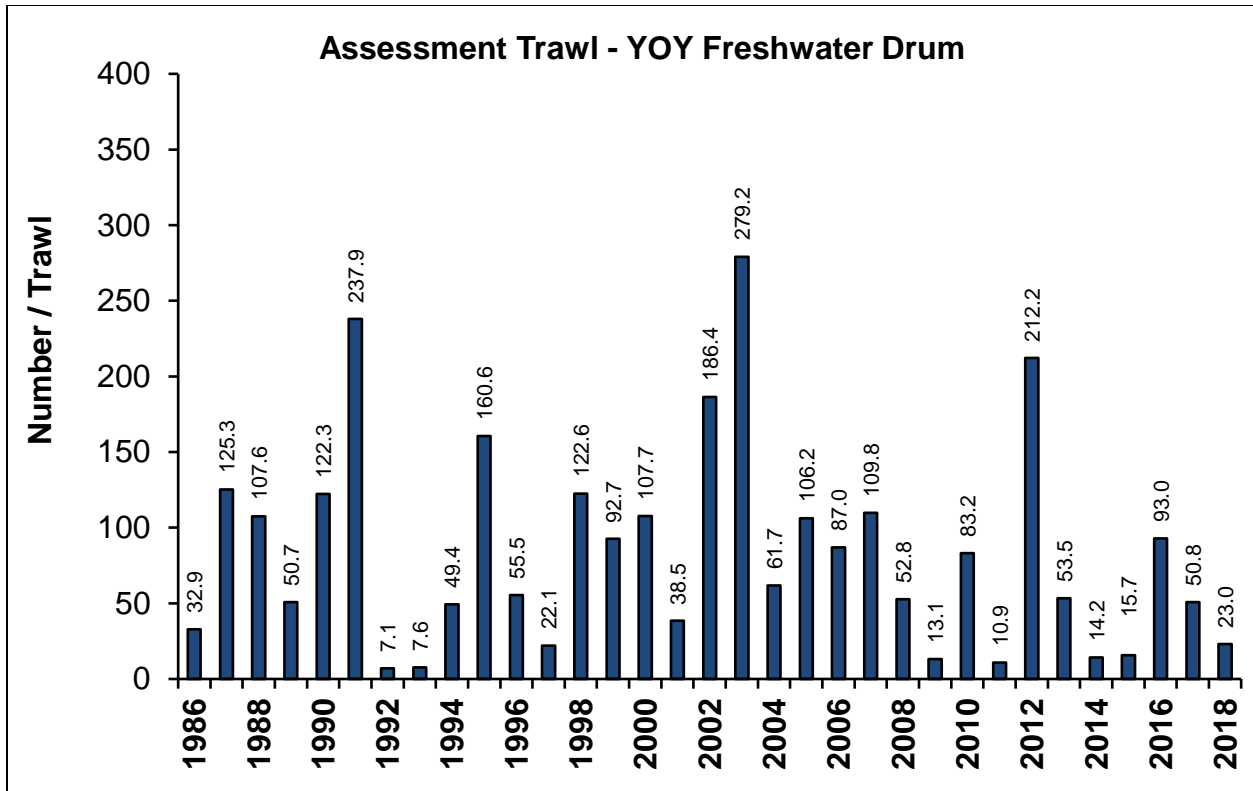


Figure 8. Average number of adult freshwater drum/trawl (lower panel) and YOY freshwater drum/trawl (upper panel) captured during bottom trawl assessments conducted on Lake Winnebago from 1986-2018.

Other Species

Overall, there were 12 species of YOY fish sampled during the 2018 trawling survey (Table 1). The bluegill YOY catch rate was 0.12/trawl, which was above the long-term average (0.04/trawl) and the highest catch since 2012. Emerald shiners were also collected during the survey at a catch rate of 0.72 YOY/trawl, that should provide some additional forage in the system. There were no YOY sauger sampled during the 2018 trawling survey but stay tuned for an updated Winnebago Sauger report.

I hope you have enjoyed reading the 2018 Winnebago trawling report. Please contact me at the phone number or email below if you have any questions or comments regarding the Winnebago trawling survey. Anyone interested in volunteering for the 2019 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 (over 400 hours donated annually) 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 2019!



Local volunteers and DNR staff sorting/counting young of year fish that were sampled during a September trawl.

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Table 1. List of trawling records (#/trawl) for the young of year fish species sampled during the Lake Winnebago trawling survey in 2018.

Year	Freshwater Drum	White Bass	Walleye	Bluegill	Yellow Perch	Black Crappie	White Crappie	Trout Perch	Emerald Shiner	Quillback	Common Carp	Gizzard Shad
1986	32.90	10.82	0.07	0.03	0.09	1.20	0.13	1.80	0.03	0.00	0.00	1.58
1987	125.26	9.11	0.00	0.04	0.31	2.74	0.12	3.30	0.03	0.01	0.02	1.83
1988	107.59	43.12	0.09	0.00	0.20	5.13	0.02	9.56	0.25	0.51	0.00	54.32
1989	50.72	18.77	0.05	0.00	0.07	3.78	0.16	7.01	0.01	0.00	0.00	43.23
1990	122.29	90.95	2.88	0.00	0.27	3.31	0.05	108.76	0.16	0.00	0.00	44.27
1991	237.93	32.88	7.31	0.00	1.09	0.45	0.19	141.72	0.17	0.02	0.02	283.99
1992	7.09	8.25	0.85	0.00	0.37	0.30	0.18	93.83	0.02	0.00	0.00	1.78
1993	7.57	2.33	2.46	0.01	0.15	0.06	0.02	50.12	0.00	0.00	0.02	1.95
1994	49.41	19.05	0.10	0.01	0.23	0.56	0.00	129.12	0.04	0.00	0.00	1.66
1995	160.56	42.98	0.19	0.05	0.51	3.31	0.00	68.16	0.00	0.04	0.01	0.62
1996	55.49	169.11	23.67	0.00	0.43	0.12	0.00	226.88	0.19	0.00	0.01	0.25
1997	22.09	23.41	2.23	0.00	0.08	0.29	0.00	138.99	0.25	0.00	0.00	2.83
1998	122.58	10.45	2.53	0.06	0.33	1.07	0.00	169.69	0.15	0.00	0.01	0.13
1999	92.69	48.85	0.23	0.04	0.46	5.01	0.00	271.65	1.12	0.00	0.12	12.89
2000	107.74	11.73	0.27	0.00	0.07	0.30	0.00	258.15	0.85	0.01	0.00	11.39
2001	38.51	36.53	11.83	0.00	2.17	0.17	0.00	279.38	0.25	0.00	0.00	25.72
2002	186.39	18.78	1.89	0.01	2.05	2.33	0.04	391.83	0.26	0.01	0.01	114.75
2003	279.15	60.26	6.51	0.00	1.88	1.75	0.00	478.25	0.02	0.00	0.01	20.33
2004	61.73	17.83	8.76	0.01	6.85	0.65	0.00	307.62	0.14	0.00	0.00	3.18
2005	106.18	50.93	11.10	0.08	5.63	4.38	0.00	315.94	0.59	0.01	0.04	60.96
2006	87.02	23.00	2.36	0.01	5.43	0.96	0.00	568.96	0.32	0.00	0.01	12.51
2007	109.79	10.68	0.49	0.13	5.61	3.46	0.00	405.41	16.95	0.01	0.00	5.60
2008	52.78	50.17	17.48	0.04	2.24	0.53	0.00	341.75	1.05	0.00	0.13	2.87
2009	13.08	17.19	1.43	0.03	1.76	6.84	0.00	449.16	1.58	0.01	0.00	124.05
2010	83.24	14.97	0.86	0.41	1.42	11.41	0.00	335.21	1.31	0.00	0.02	197.21
2011	10.92	102.41	10.44	0.03	5.65	1.25	0.00	249.89	1.72	0.00	0.01	5.65
2012	212.19	36.71	0.21	0.39	1.00	3.07	0.00	133.61	5.46	0.00	0.01	122.60
2013	53.46	12.09	11.88	0.00	0.86	0.96	0.00	100.78	3.43	0.01	0.00	19.49
2014	14.20	0.20	0.42	0.00	0.07	0.25	0.00	94.23	0.17	0.00	0.00	11.41
2015	15.67	4.28	1.40	0.00	0.69	1.37	0.00	106.19	0.08	0.01	0.00	11.70
2016	92.96	17.61	9.90	0.00	2.32	24.05	0.00	359.77	3.47	0.00	0.00	102.42
2017	50.78	7.38	4.13	0.00	0.75	0.90	0.00	456.30	0.16	0.00	0.00	1.28
2018	23.02	0.78	5.14	0.12	3.48	2.06	0.01	206.35	0.72	0.01	0.10	0.39
Average	84.64	31.96	4.52	0.04	1.60	2.85	0.03	219.98	1.26	0.02	0.01	39.54