2018 Winnebago System Yellow Perch Report

Ryan Koenigs, Winnebago Sturgeon and Panfish Biologist, July 16, 2018

The yellow perch fishery on the Winnebago System has grown in popularity over the last decade, which prompted the DNR fisheries crew to collect more information about trends within the perch population and the driving factors behind those trends. Two core assessments have been utilized to gather data. The bottom trawl assessment conducted on Lake Winnebago from August-October has provided annual catch per effort data for age-0 and adult yellow perch since 1986. More recently (2012), annual fyke netting surveys have been conducted shortly after ice out to collect pre-spawn yellow perch. The Fox River near Rainbow Park in Oshkosh and Asylum Bay on Lake Winnebago have served as reference sampling locations. Data on length, sex, and spawning stage are collected for each fish handled and aging structures are removed from a subsample of fish to estimate age distribution and growth and mortality rates. Additionally, in recent years a sample of fish have been marked with Floy anchor tags each year to gather movement data and estimate exploitation (harvest) rates by anglers. The tags have been white and include a unique identification number on one side and the DNR address on the other side.

Lake Winnebago Bottom Trawling Results

The annual bottom trawl assessment conducted on Lake Winnebago is one of the most important surveys conducted to gather information used to manage the Winnebago System fishery. The trawling survey consists of 46 trawl hauls conducted at standardized waypoints during the first week of August, September, and October. Each haul includes pulling a bottom trawl net (27' head rope) along the bottom for 5 minutes at 4 miles per hour, covering roughly 1.1 acres of lake bottom. This standardized assessment allows for catch data to be compared among years that provides a relative gauge of year class strength of various species.

All life stages of fish are captured during the survey, but the catch of age-0 (also known as young of year) fish is of most interest to managers. Catch rates of age-0 yellow perch has been variable through time (Figure 1), but in general were low from 1986-2000 (average 0.3 fish/trawl) before a stark increase since 2000 (average 2.7 fish/trawl). Consistent, strong year classes were produced between 2001-2011, but unfortunately recruitment has been more erratic in recent years. The 2016 year class was the first strong year class since 2011, as the catch rate of 2.3 fish/trawl ranked as the 6th largest year class over the course of the assessment. The catch rate of age-0 yellow perch in 2017 year class was not as strong (0.7 fish/trawl), but was still a measurable year class.

Catch rates of adult fish (age-1 and older for yellow perch) can also be compared to past years to gauge relative abundance of a given fish species. Similar to catch rates of age-0 yellow perch, adult catch rates have been quite variable. Yellow perch experience high mortality rates, thus a strong year class only makes a strong contribution to the adult population for 1-2 years. Strong year classes in 2004 and 2005 resulted in a record adult

catch rate during the 2006 trawling assessment. The good news for anglers is that adult perch catch rates during the 2017 trawling assessment increased substantially following consecutive very low adult catch rates in 2015 and 2016. The increase in abundance is largely influenced by the 2016 year class as age-1 fish in 2017.

Yellow perch on the Winnebago System exhibit rapid growth rates and thus recruit to angler harvest during their 3rd summer of growth. Most fish handled during October 2017 trawling assessments were 6.5-7.9", and smaller than what many anglers target for their harvest standards. With the rapid growth rates of yellow perch, these fish will mostly be >8" by the time perch fishing starts ramping up in July.

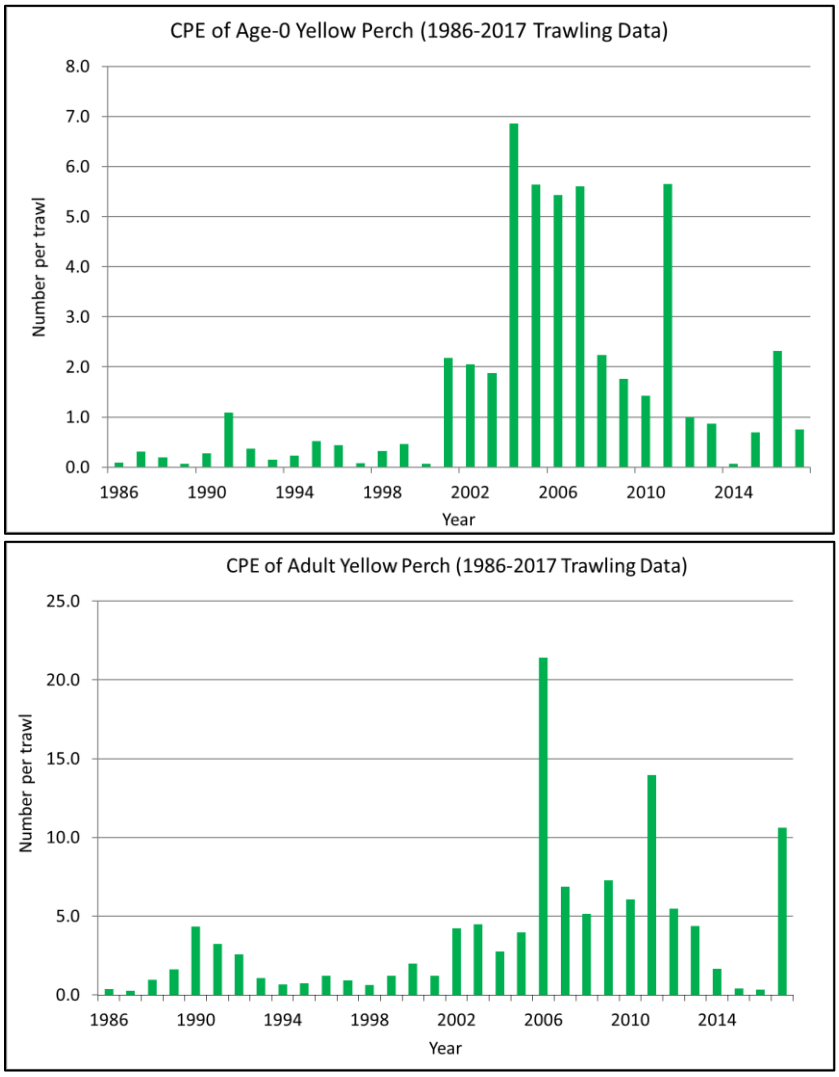

Figure 1. Catch per effort of age-0 (top) and adult (bottom) yellow perch observed during bottom trawl assessments conducted on Lake Winnebago (1986-2017).

Spring Fyke Net Assessments

Annual spring fyke net assessments began in 2012 with an extremely high catch rate of yellow perch in the Fox River near Rainbow Park (1,439 perch/net) and a high catch rate in Asylum Bay (183 perch/net). The catch rate in the Fox River was likely impacted by the abnormal, 80-degree weather conditions in March of 2012 that drastically condensed the spawning period for yellow perch. Regardless, there was an abundance of yellow perch as indicated by the high catch rate of yearling yellow perch during 2011 bottom trawling. Catch rates of yellow perch in the Fox River remained strong in 2013 (236.5 perch/net) and 2014 (250 perch/net), but declined precipitously in 2015-2017 (Table 1). Asylum Bay was not sampled in 2013 or 2014, but has been sampled annually since 2015. Similar to results from the Fox River, catch rates were quite low between 2015-2017 (Table 1). Catch rates at both locations rebounded in 2018 (145.9 perch/net in the Fox River and 251.1 perch/net in Asylum Bay). These results support trends observed during the 2017 fall bottom trawl assessment, which indicated an increase in relative abundance of yellow perch following 5 years of consistent decline (Figure 1).

Table 1. Catch rates of adult yellow perch observed during spring fyke net assessments conducted on the Fox River in Oshkosh and Asylum Bay (2012-2018).

Year	Fox River Yellow Perch/net	Asylum Bay Catch/net
2012	1439.0	183.0
2013	236.5	
2014	250.0	
2015	11.8	7.5
2016	3.0	3.7
2017	16.8	11.5
2018	145.9	251.1

The increased catch rates of yellow perch during 2018 assessments was a direct result of the 2016 year class recruiting to the adult population. Age and growth data indicated that 94.7% of the adult females handled and 99.6% of the males handled were age-2 (Figure 2). The strong contribution of age-2 fish resulted in a length frequency dominated by smaller fish (Figure 3). In fact, 72.8% of the female yellow perch handled were 7.0-8.4", while 82.3% of the males were 6.5-7.9".

Results observed during 2018 fyke net assessments were very similar to 2012. Both sampling years had high catch rates of adult fish and a size structure dominated by smaller fish (78.9% and 92.8% of the female and male population was 6.0-7.9" fish). A partial creel survey was conducted in 2012 to collect angler catch and harvest data from yellow perch fishery between July-September. Perch fishing in 2012 was exceptional and many anglers were harvesting limits of 8+" yellow perch by early July and 9+" fish by early September. 2018 should follow a similar trend and provide some exceptional yellow perch angling opportunities.

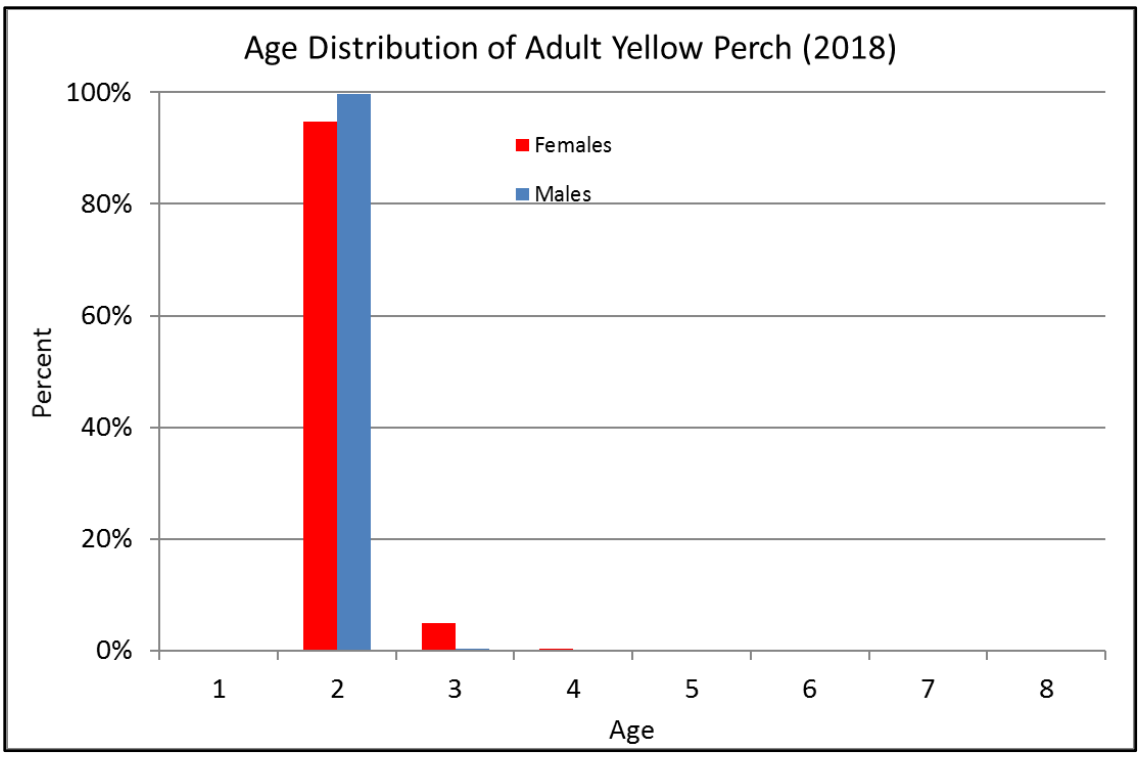

Figure 2. Age distribution of adult yellow perch captured during spring fyke net assessments conducted on the Fox River (Oshkosh) and Asylum Bay in 2018.

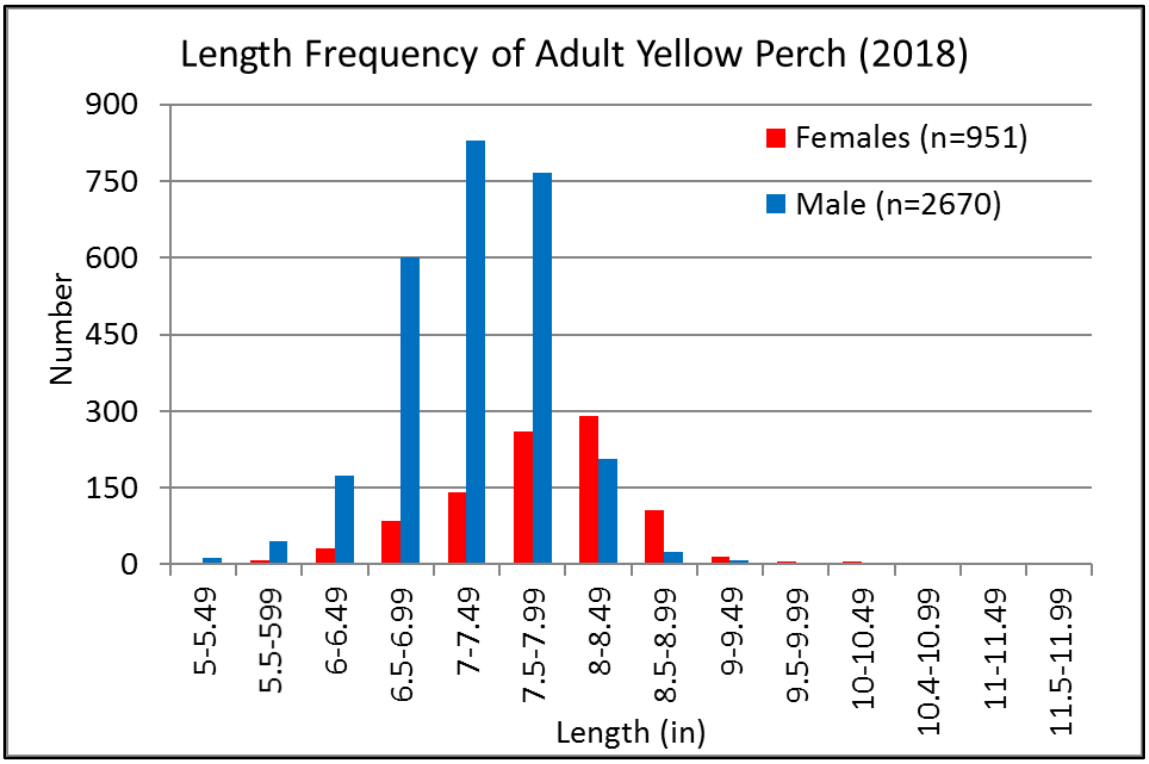

Figure 3. Length frequency of adult yellow perch captured during spring fyke net assessments conducted on the Fox River (Oshkosh) and Asylum Bay in 2018.

Angler Harvest and Exploitation

The two assessments described earlier in the report provide great insight into the relative abundance, size structure and age structure of the yellow perch population. However, these assessments do not provide insight into how harvest impacts the population. Age data collected over the years indicate that total annual mortality is high (61.6% for females and 69.0% for males) for yellow perch on the Winnebago System, but there is limited harvest data available to assess whether the high mortality is attributable mostly to harvest or natural mortality. A partial creel survey that was conducted in 2012 (report available upon request) indicated that harvest of yellow perch can be high, but limited funding restricted survey objectives to collecting data related to catch/harvest rates and size and sex of harvested fish. There was not an estimation of total effort and therefore not a total harvest estimate.

A yellow perch tagging project began in 2015 to better evaluate the impact of harvest on yellow perch. White Floy anchor tags have been used each spring to mark fish (photo inset), similar to how walleye have been marked with yellow tags since the early 1990s. Anglers should notify DNR staff of whenever they catch a tagged fish. We know how many fish of each sex are tagged each spring and can thus estimate exploitation (harvest) rates for the population. Fish have been tagged at various locations throughout the Winnebago Pool Lakes, but for this report we will focus on fish tagged at the reference locations of the Fox River (Oshkosh) and Asylum Bay.

Lower catch rates of adult yellow perch in 2015-2017 made it difficult to tag large numbers of yellow perch (Table 2). Ideally, a minimum of 500 fish of each sex would be marked to estimate exploitation, but that simply was not possible over the first 3 years of the study. A 39% tag reporting rate was used to estimate exploitation rates based on preliminary results from a reward tag study being conducted on the Winnebago System for walleye. Exploitation rates observed over the three years were quite variable (Figure 4), but in general were much lower in 2015 (11.8% for females; 3.6% for males) than 2017 (49.2% for females; 46.0% for males). Tagging numbers (36 fish total) were very low in 2016, thus extreme caution should be used when reporting exploitation rates for that year.

The resurgence of the yellow perch population in 2018 presents the best opportunity to estimate exploitation rates for yellow perch. For starters, an adequate sample size of fish was tagged. Further, 2018 should present excellent fishing opportunities and thus fishing effort should be high. This year will mark an important year for the yellow perch fishery.

Anglers who catch a tagged yellow perch, walleye, northern pike, largemouth bass or smallmouth bass should notify the DNR via email (DNRWinnebagoSystemTagReturns@Wisconsin.gov), phone (920-303-5429), or mail to the Oshkosh DNR office (625 East County Road Y, Oshkosh WI 54901) anytime they catch a tagged fish. The data collected from angler tag returns is extremely important and is crucial for making proper regulation decisions to manage the fishery.

Table 2. Number of male and female yellow perch marked at the Fox River (Oshkosh) and Asylum Bay during spring fyke net assessments (2015-2018).

	2015		2016		2017		2018	
	Females	Males	Females	Males	Females	Males	Females	Males
Fox River	75	201	0	0	118	36	331	514
Asylum Bay	34	159	25	11	33	3	247	738
Total	109	360	25	11	151	39	578	1252

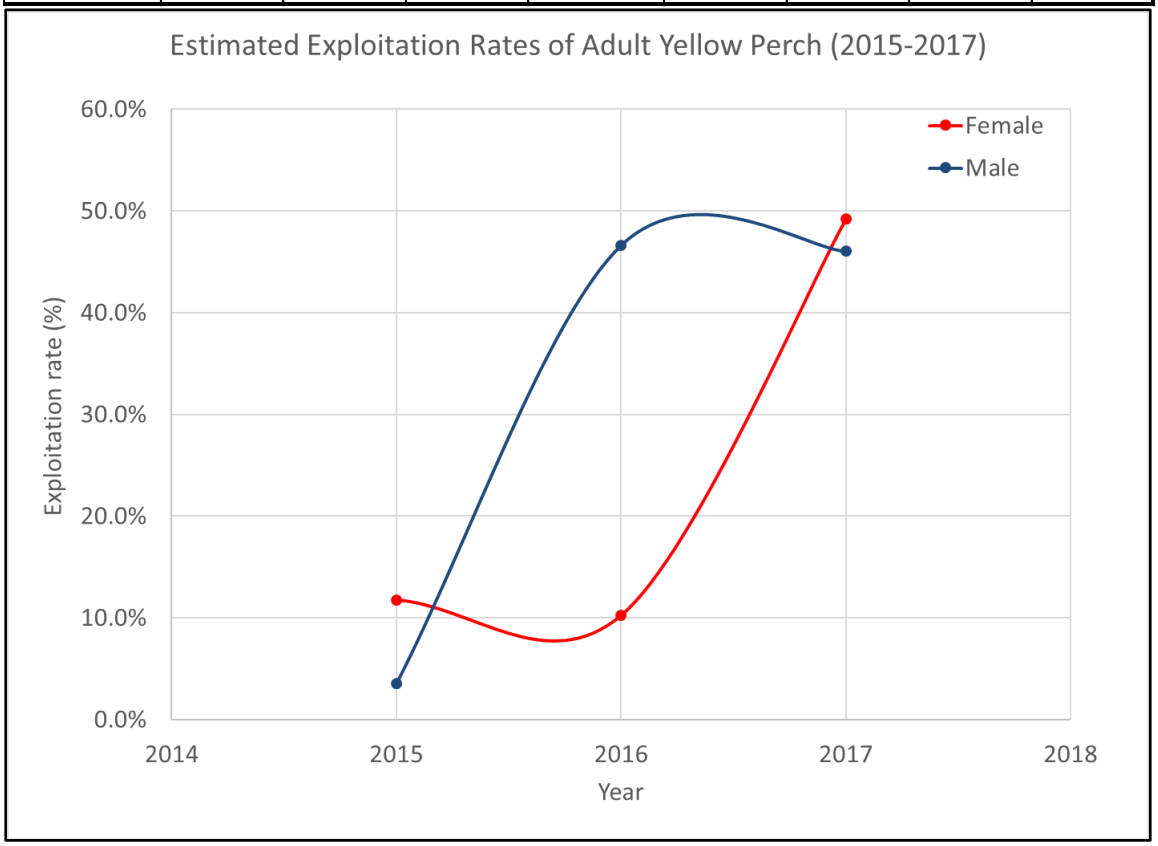

Figure 4. Estimated exploitation rates for adult yellow perch marked during spring fyke net assessments conducted in the Fox River (Oshkosh) and Asylum Bay (2015-2017)

The Winnebago System is home to a diverse fishery that provides quality angling opportunities year-round. The yellow perch fishery has become an important component of that fishery. However, as shown throughout this report, the fishery is driven by relatively young fish and heavily influenced by strong and weak year classes. Weaker year classes of yellow perch from 2012-2015 resulted in lower densities of perch in recent years. A strong year class in 2016 has the fishery poised for a resurgence in 2018

though. So make plans to get out and enjoy the resource! Maybe even recruit some new anglers to the sport, particularly youth.

Good luck fishing in 2018!

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