Yellow perch assessments in Wisconsin waters of Lake Michigan 2019

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2019 Spawning Survey

The 2019 yellow perch spawning survey was conducted near the Green Can Reef outside of the Milwaukee harbor using 500' gangs of gillnets containing one 100' panel of each 2.0", 2.5", 2.75", 3.0", and 3.25" stretch mesh. The Green Can Reef area off Milwaukee is the established index site for the annual yellow perch spawning assessment. Protocols for this survey are more clearly defined in Standard Operating Procedures for the Southern Lake Michigan Fisheries Work Unit (WDNR 2014).

Two gangs of 500' gillnets were set for 6 nights between 05/14/2019 to 06/18/2019, totaling 6,000 feet of gillnet effort. The nets were set in depths ranging from 30'-65' and the bottom water temperature ranged from 44-52 °F. All nets were set from the LMWU 20' Lake Sturgeon work boat. The nets were lifted once from the WDNR *R/V Coregonus* and the remaining lifts were all from the Lake Sturgeon work boat.

In total, 29 yellow perch were captured, 14 of which were ripe males and the remaining 15 were females. On the first lift on 05/14 a ripe female was captured and on the second to last lift on 06/04 the first spent females of the survey were captured. Ripe males were captured throughout the survey. Aging structures were collected from 5 individuals ranging from 214mm to 342mm. Using spines, four of those perch were estimated at 3 years old, while the largest (342mm) was an 11-year-old female. Although the catch was higher in 2019 than the record low catch of 2018, numbers of yellow perch captured remain extremely low.

In addition to yellow perch, round whitefish (137), alewife (6), burbot (5), lake trout (3), longnose sucker (3), a rock bass, and a round goby were captured.

Due to poor weather conditions and limited availability of divers, no egg skein diving surveys were conducted during spring of 2019.

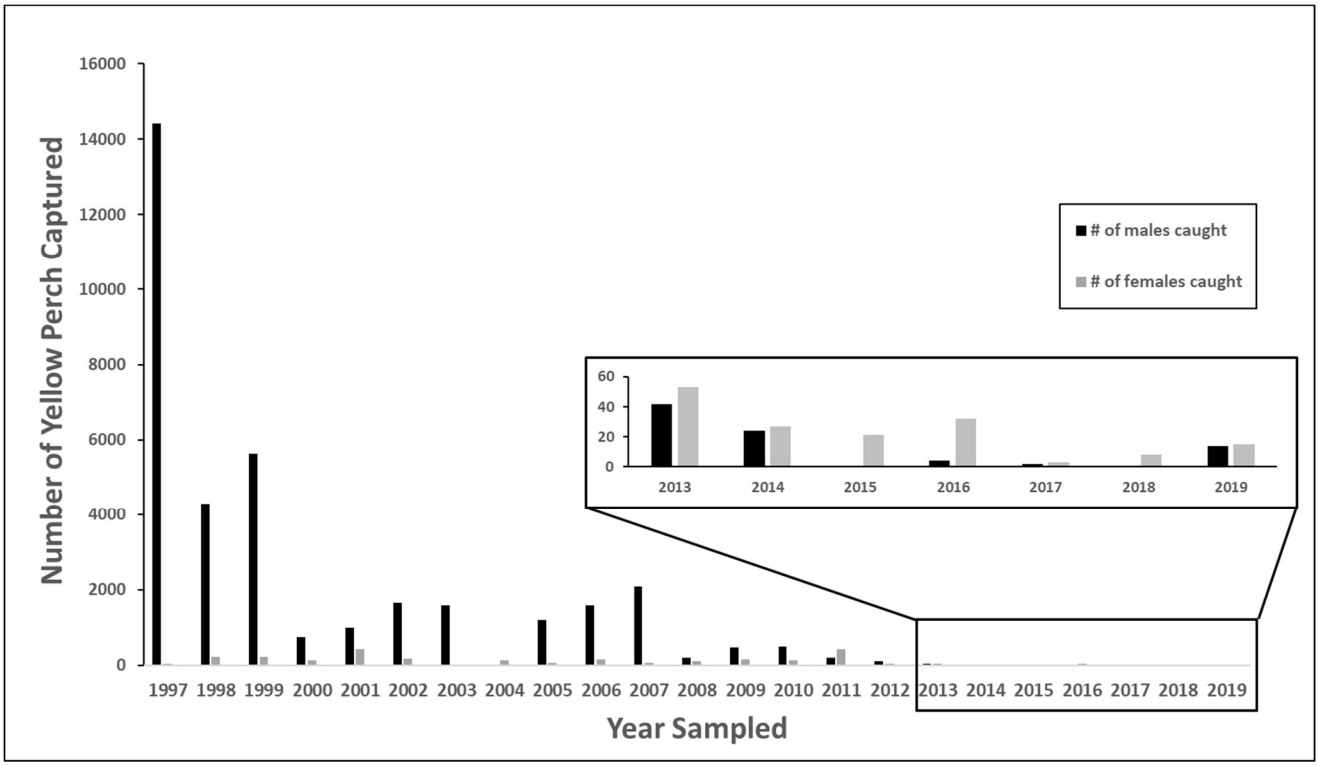

Figure 1. Yellow Perch Spawning Assessment Green Can Reef, Lake Michigan, Milwaukee, WDNR 1997-2019.

2019 Young of Year Survey

An annual survey of young-of-the-year (YOY) yellow perch along the Lake Michigan shoreline typically consists of both seining and micromesh gill netting efforts. Due to budget constraints only micromesh gillnetting was conducted during the summer of 2019. This monitoring occurred from 8/21/19 to 10/08/19.

Generally, two index stations, Shoop Park (Racine Co.) and Doctors Park (Milwaukee Co.), have been used for setting micromesh gill net for our annual survey. Starting in 2016 we added a third site at the North end of Bradford Beach (Milwaukee Co.) over ideal habitat. This site gives us an opportunity to sample in less than ideal conditions for the inflatable and we are able to use our 20' work boat to set and lift nets. On all sites the nets are set in nearshore waters at depths ranging from 5 ft. to 6 ft. and fished overnight. In 2019, we had five sets using two 200-foot long and 5--foot deep monofilament net panels consisting of 12mm stretch mesh. A total of 7 YOY and 2 juvenile yellow perch were caught in our micro mesh nets in 2019.

On 8/21 and 10/08 we set 200' and 400' of micromesh gill net off Doctors Park. The water temperature was 68 F and 57 F respectively, and no yellow perch were captured.

On 8/21 we lifted 200' of net fished for one night off Shoop Park using our inflatable with a 2.5HP Suzuki outboard. The water temperature was 72 F and one 121mm perch was caught. We set another 400' off Shoop Park on 9/26 with a 56 F water temp and captured 4 YOY yellow perch.

400 feet of net was set North of Bradford Beach both on 8/28 and 9/24. Water temps were 62 F and 56 F respectively. On 8/28 one YOY perch and one 221mm perch were captured and on 9/24 two YOY perch were captured.

Table 1. Numbers of fish captured in the YOY yellow perch micromesh gillnet survey at index stations (Lake Michigan nearshore waters), WDNR – 2019.

Species	**Number of fish**
Alewife	162
Round Whitefish	1
Coho Salmon	1
Spottail Shiner	112
Rainbow Smelt	52
Yellow Perch (YOY)	7
Yellow Perch juvenile	2
Round Goby (YOY and juvenile)	434

Micromesh gill net surveys were conducted at index sites like the previous years of sampling. Overall, the conditions for sampling were good with little Cladophora. Beach seining was not conducted in 2019 due to budget restraints but efforts are scheduled to be resumed in 2020. We met our goal in covering the area of Milwaukee and Racine for micromesh, visiting each site twice. The nets were effective in capturing multiple species of fish although YOY Yellow Perch catch was low. 2019 follows poor catches in the previous couple years and continually shows poor recruitment.

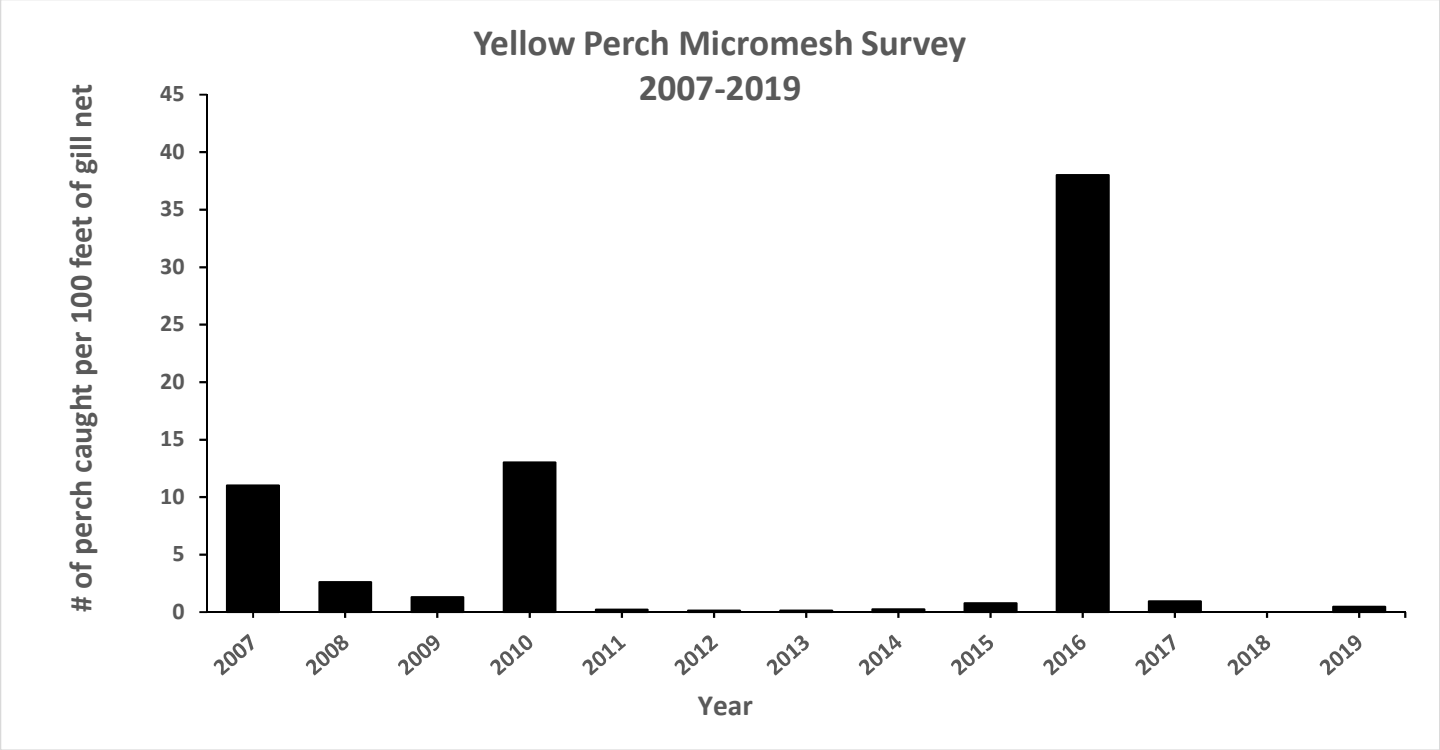

Figure 2. Micromesh gill net catch per 100 feet of young-of-the-year yellow perch in the nearshore waters of Lake Michigan, WDNR 2007-2019.

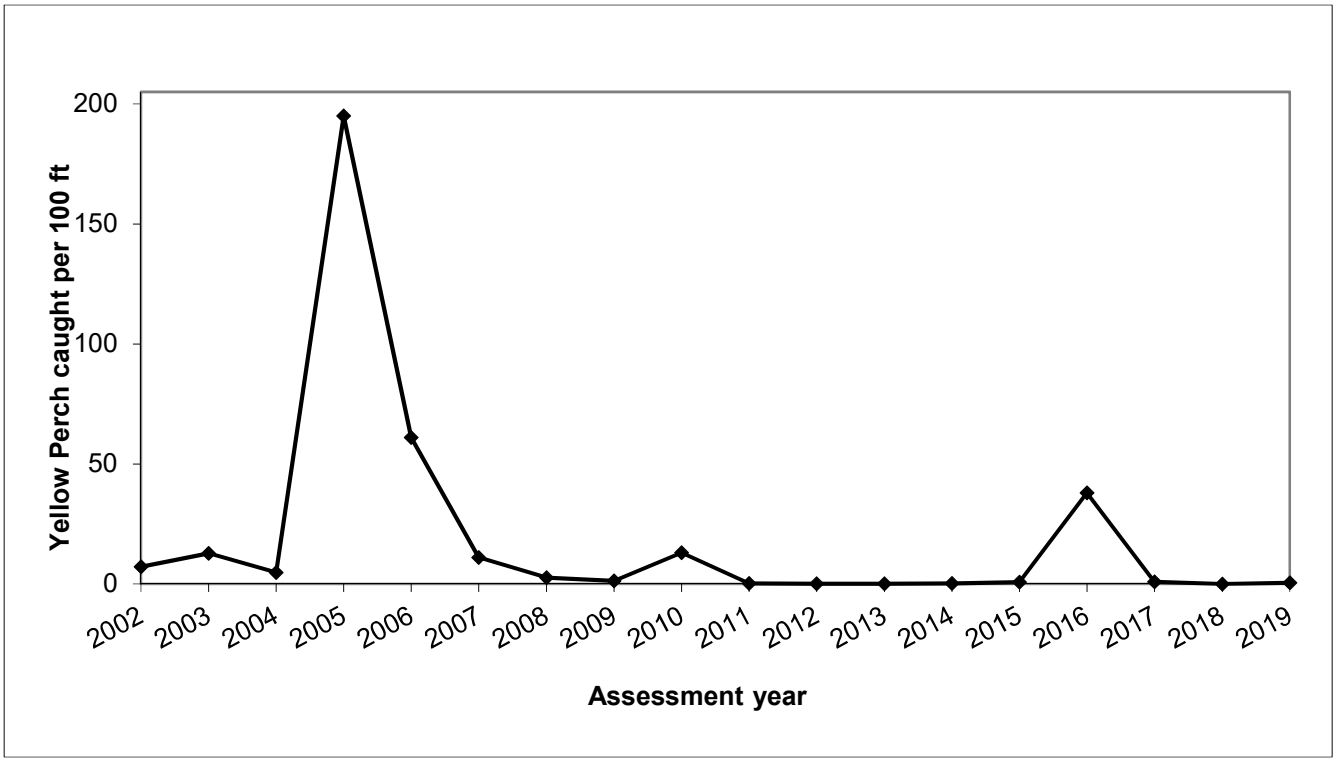

Figure 3. Historical micromesh gill net catch per 100 feet of young-of-the-year yellow perch in the nearshore waters of Lake Michigan, WDNR 2002-2019.

2020 Winter Graded Mesh Assessment- Survey dates (12/03/2019-12/05/2019)

Our annual winter graded mesh assessment of the yellow perch population in Lake Michigan for 2020 was conducted between December 3, 2019 and December 5, 2019. Historically, the 2020 survey would be conducted January of 2020, however, due to availability of the boat and marina space this survey was conducted in December when yellow perch should be schooled in similar locations. For the winter graded mesh survey, we try to set 20 boxes of net. Each box of gill net contains one 50' panel of each 1.0", 1.25", 1.5", 1.75" and one 100' panel of each 2.0", 2.25", 2.5", 2.75", 3.0", and 3.25" stretch monofilament mesh, totaling 800' per box. Two or three boxes of net are then attached at the ends to create a gang. The survey was conducted off the near shore waters of Milwaukee to the north, middle, and south using the DNR research vessel *R/V Coregonus*. We lifted two 2400' gangs and one 1600' gang on 12/03/19 to the North of Green Can at depths ranging from 42 to 83ft. One perch was caught. We reset these three gangs to the North of the harbor covering 53 to 75-foot depths and lifted on 12/04/19. Only one perch was captured on 12/04/19. The same three gangs were finally set to the South of the harbor covering depths of 45 to 67 ft and lifted on 12/05/19, also only capturing one perch. All lifts combined we were able to surpass our goal of 20 boxes by successfully completing 19,200 ft of gill net effort over three nights. The surface water temperature during the sampling period was 42^0F, similar to previous years of sampling. Our catch of yellow perch consisted of one, six-year-old male (2013 cohort) and two, 14-year-old females (2005 cohort). For standardization purposes, graded mesh assessment data is often reported as catch rate per 10,000ft of equal length mesh panels. In these terms, our adjusted catch was less than 2 yellow perch per 10,000' of standardized mesh gill net in the 2020 graded mesh assessment.

Table 2. Number of yellow perch caught by mesh size in the 2020 graded mesh assessment.

Mesh Size (in)	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25
# of Yellow Perch						1			1	1

Table 3. Number of yellow perch caught by age in the 2020 graded mesh assessment.

Age	2	3	4	5	6	7	8	9	10	11	12	13	14
# of Yellow Perch					1								2
Average Length (mm)					222								335

We maintained our yellow perch graded mesh standard protocol while choosing locations and depths. Low catches and few cohorts of yellow perch in this assessment highlight a lack of recruitment and low overall population. The nets appeared to be fishing effectively evident by the good numbers of round white fish (198) caught in the nets. Other species included lake trout (20), burbot (21), and 1 lake whitefish. The nets were not clogged by Cladophora which occasionally occurs in shallow waters. We also collected biological data on all round whitefish and tissue samples from all burbot for further analyses by collaborating partners.

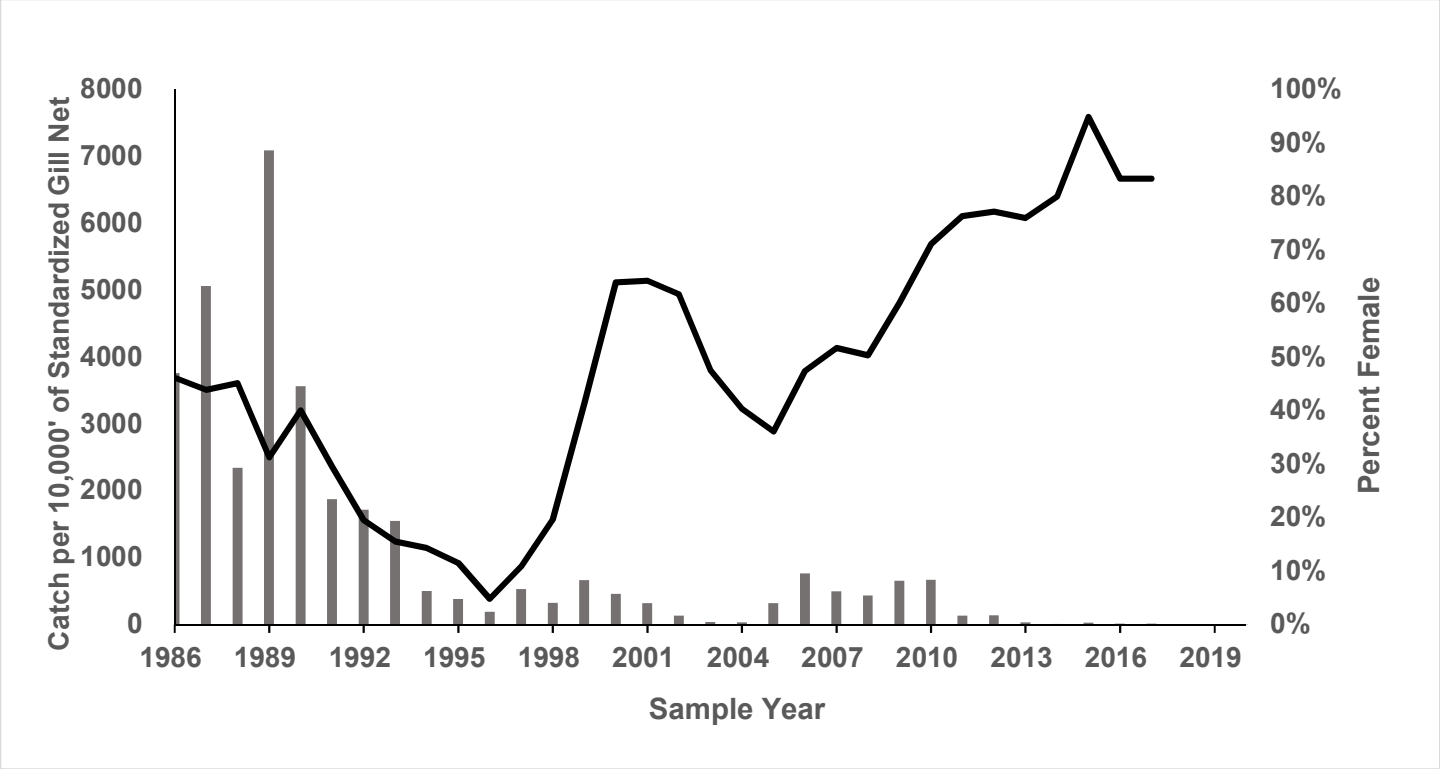

Figure 4. Adult yellow perch standardized CPUE and percent female in the Wisconsin waters of Lake Michigan winter gill net assessment, Milwaukee, WI, 1986-2020.

2019 Survey Year Summary

Yellow perch populations remain low and struggle to produce significant year classes. Even when YOY classes are detected in targeted surveys (2005-2007, 2010 and 2016 figure 3) they rarely survived in significant numbers to be detected in spawning or graded mesh surveys. Yellow perch from the 2016 cohort were captured during the spawning survey and are showing up in the creel. Although these numbers are low, the 2016 cohort is the most recent semi-successful recruitment in the recent 8 years. Many factors contributed to the decrease in yellow perch populations in Southen Lake Michigan. For more details see the Lake Michigan Yellow Perch Summit Summary Report (https://dnr.wi.gov/topic/fishing/Documents/LakeMichigan/LakeMichiganYellowPerchSummitReport.pdf).

In 2019 the Milwaukee Estuary Habitat and Yellow Perch Task Group met for the first time since 2015 to discuss project results and recent surveys. Projects such as the mapping of the Milwaukee Estuary habitat, yellow perch genetics, and fin clip regeneration study were discussed as well as potential future projects in the Milwaukee Area of Concern. A common theme discussed among the various projects was a lack of suitable habitat and food for various life stages of yellow perch. There may be several bottlenecks that negatively impact yellow perch recruitment. Habitat improvements at a large scale are being discussed within the Milwaukee Area of Concern and 4 of these potential projects could benefit yellow perch. The genetics study suggested that perch from the East shore were disticntly different from perch on the West shore of Lake Michigan. The study also suggested that yellow perch from Green Bay also differ from the Milwaukee perch populations. It was suggested that a management plan for yellow perch in Milwaukee harbor would be a good first step. This comment was then followed up by many suggesting that a mangement plan would be more effective after the Area of Concern work has been completed where more in depth monitoring could be done on the impacts to the perch populations. There is not currently another meeting planned, however the group may reconvene during or after the habitat projects in the AOC are being designed and completed.