

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Yellow Perch Assessments in Wisconsin Waters of Lake Michigan

2022



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2022 Spawning Survey

SPRING GILL NET SURVEY DATES (MAY 17 – JUNE 7, 2022)

The Wisconsin Department of Natural Resources (DNR)'s 2022 yellow perch spawning survey was conducted near the Green Can Reef outside of the Milwaukee Harbor using gillnets containing one 100-foot panel of each 2.0-inch, 2.5-inch, 2.75-inch, 3.0-inch and 3.25-inch mesh.

The Green Can Reef area off Milwaukee is the established index site for our annual yellow perch spawning assessment. Protocols for this survey are more clearly defined in the Standard Operating Procedures for the Southern Lake Michigan Fisheries Work Unit (LMWU; DNR 2014). A single gill net is 500 feet long and two gillnets tied together create one 1,000-foot long gang. When setting nets off of the RV Sturgeon, individual gill nets were used. When setting nets off of the RV Coregonus, gangs of gillnets were set. The survey began May 17, 2022 and continued through June 7, 2022. Depths from 25 to 62 feet of water were sampled. Water temperature on the bottom of the lake ranged from 42°F to 49°F during the survey. The total effort for the 2022 survey was 6,000 feet of gillnet set for one night.

The first nets were set on May 16 from the RV Sturgeon, capturing 16 perch. This set consisted of 1,000 feet of gill net set from 25 to 41 feet of water. The bottom temperature was 44.6°F.

The second nets were set on May 22 from the RV Coregonus, capturing 18 perch. This set consisted of 2,000 feet of gill net set from 30 to 41 feet of water. The bottom temperature was 48.2°F at the time nets were set.

The third nets were set on June 1 from the RV Coregonus, capturing 14 perch. This set consisted of 2,000 feet of gill net set from 32 to 62 feet of water. The bottom temperature was 42.8°F at the time nets were set.

The final nets were set on June 6 from the RV Sturgeon, capturing 60 perch. This set consisted of 1,000 feet of gill net set from 25 to 39 feet of water. The bottom temperature was 47.8°F. During this lift, perch skeins were tangled in the nets and many ripe females were observed. This concluded the netting portion of the survey, and we conducted the diving survey searching for perch skeins the next day.

In total, 106 yellow perch were captured, 88 of which were ripe males, and the remaining 18 were females. Aging structures were collected from all individuals. Most of the perch (44) were from the 2016 cohort (6 years old), six fish were from the 2017 cohort (5 years old), and 19 fish were from the 2018 cohort (4 years old). The number of yellow perch captured remained extremely low. However, the 2016 year-class continues to show up stronger than others in the 2022 spawning survey. This was the same trend seen in the 2021 spawning survey with the addition of some fish captured from the 2015, 2019 and 2020 cohorts.

In addition to yellow perch, round whitefish, alewife, burbot, lake trout, longnose sucker, white sucker, rock bass and round goby were also captured.

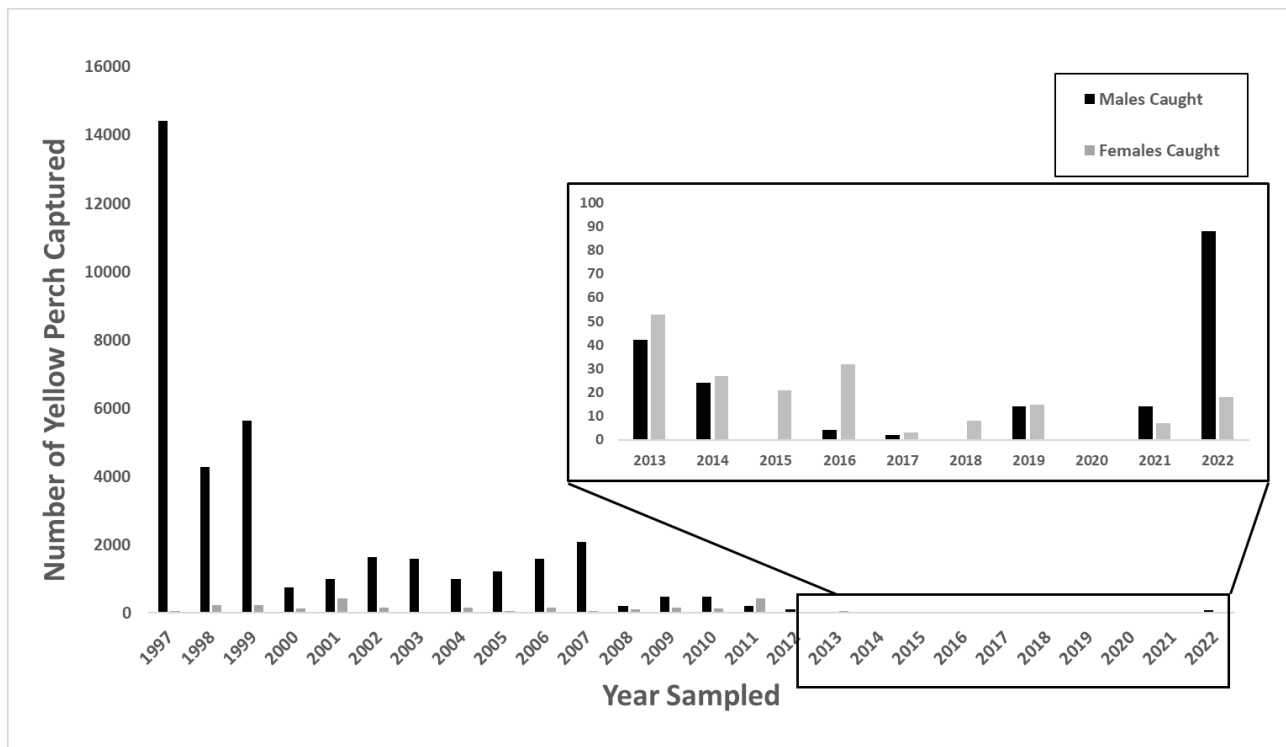


Figure 1. Yellow perch spawning assessment at the Green Can Reef, Lake Michigan, Milwaukee, DNR 1997-2022.

No spawning survey was conducted in 2020

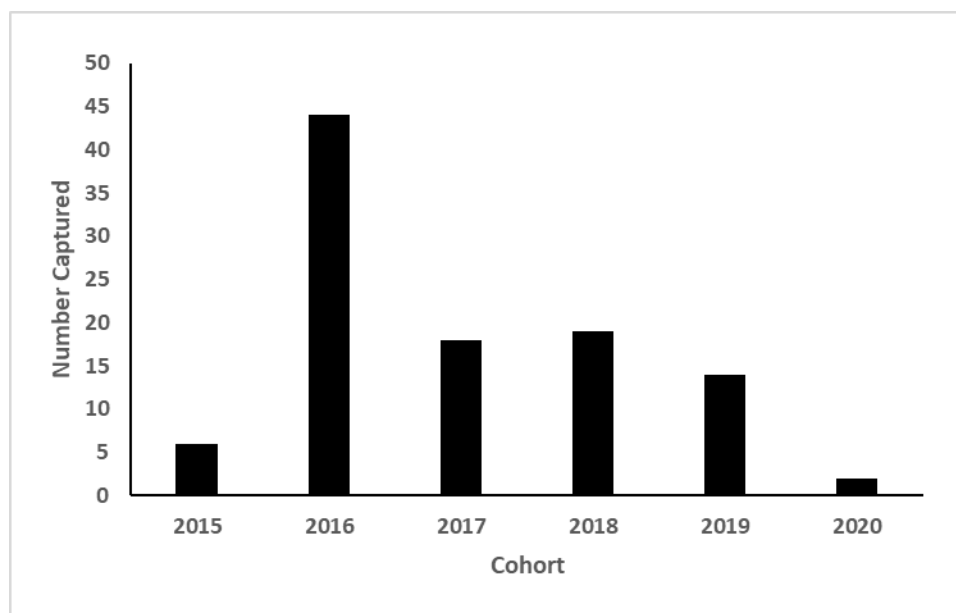


Figure 2. Cohorts of yellow perch captured during annual spawning assessments on Green Can Reef, Lake Michigan, Milwaukee, DNR 2022.

YELLOW PERCH EGG DEPOSITION DIVING SURVEY DATE (JUNE 8, 2022)

The DNR yellow perch egg deposition survey is conducted to estimate relative annual egg densities. During the initial years of the survey, we found very few egg masses. In 1997, divers searched for eggs for 31 hours and 40 minutes and found a total of nine egg masses on the transects or nets or 0.50 egg masses per 1,000 square meters. In 1998, divers searched for 12 hours and 48 minutes and found zero egg masses or 0.0 egg masses per 1,000 square meters. However, after the females from the 1998 year-class matured, we found good numbers of egg masses distributed on the Green Can Reef from 2001-2007. Divers have observed few egg skeins since the late 2000s. Due to logistical and weather-related issues, we were unable to conduct the dive survey in 2015, 2016, 2019, 2020 and 2021. In 2017 and 2018, we completed one day of diving each year, and the results corroborated what we have been catching in both our graded mesh and spawning nets. We saw four egg skeins in four dives in 2017 and one skein in four dives in 2018.

In 2022, the egg deposition survey was conducted on the Green Can Reef outside of the Milwaukee Harbor using four divers June 8. In total, 77 minutes of bottom time was logged, covering approximately 26,000 square meters of substrate, and no perch skeins were observed. One of the transects that was searched was on the location where the gill net captured ripe female perch and skeins the day prior, yet no skeins were observed in the four dives.

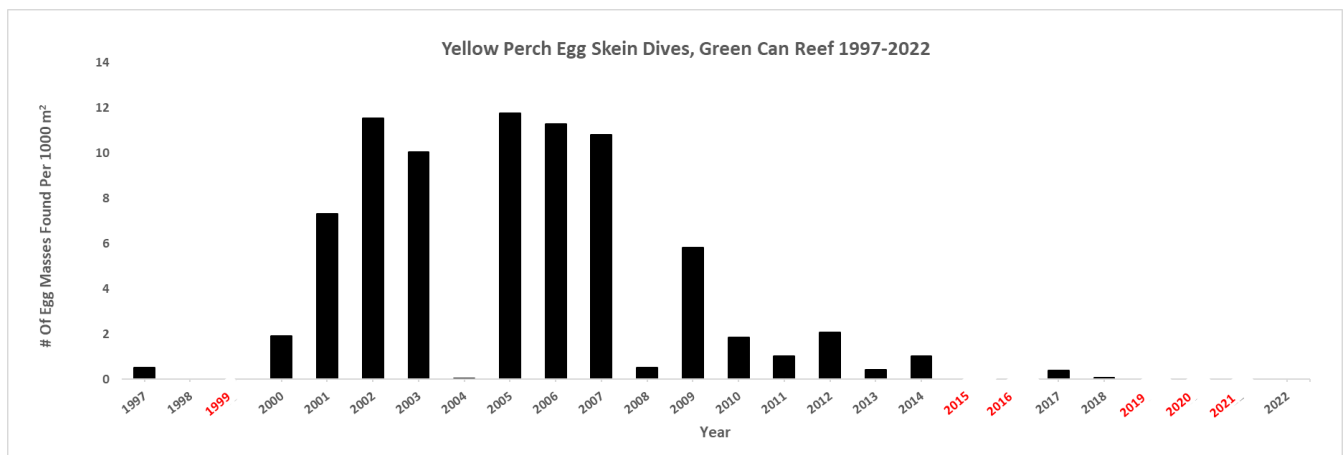


Figure 3. Number of yellow perch skeins found per 1000m² during egg deposition surveys conducted via diving on Green Can Reef, Lake Michigan, Milwaukee, DNR 1997-2022.

**Red text indicates that a survey was not conducted on that year.*

Young of Year Survey

SURVEY DATES (AUG. 17, 2022 AND SEPT. 1 AND 2, 2022)

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 encompassing sampling

sites from Sheboygan to Kenosha. In 2022, no micromesh survey was conducted due to weather and staff constraints, but a seining survey was completed.

The seining survey was carried out on Aug. 17 and then again on Sept.1-2, 2022. A standard 25-foot beach seine was pulled by two persons in shallow nearshore waters of Lake Michigan. Each pull consisted of a 100-foot sweep either parallel to the beach or perpendicular to the beach or along piers and jetties depending on the depth and feasibility of seining. At each station, depending on conditions, two 100-foot pulls were attempted unless algae bloom limited our ability to effectively pull the net, especially when sampling around jetties and windward shores.

A total of fifteen stations were sampled from Sheboygan to Kenosha (Sheboygan – 3, Ozaukee – 3, Milwaukee – 5, Racine -2 and Kenosha -2). Each site was sampled twice, once during the first portion of the survey in August and then again in September. Seining conditions during the sampling period varied among different sites on different days depending on wind direction. Some sites were difficult to seine due to cladophora clogging the net, while others were clear and easy to sample. In general, seining conditions this year were favorable for this assessment. A total of 52 seine hauls were usable from the fifteen sites for a total of 5,200 feet of seine haul. The water temperature during the survey ranged from 65-69°F during the August samples and 68-77°F in September.

No perch were captured during the entirety of this survey. YOY alewife dominated the catch, although they were far fewer than the 2020 survey. Other species captured included spottail shiner, round goby, Johnny darter, longnose dace and bloater chub.

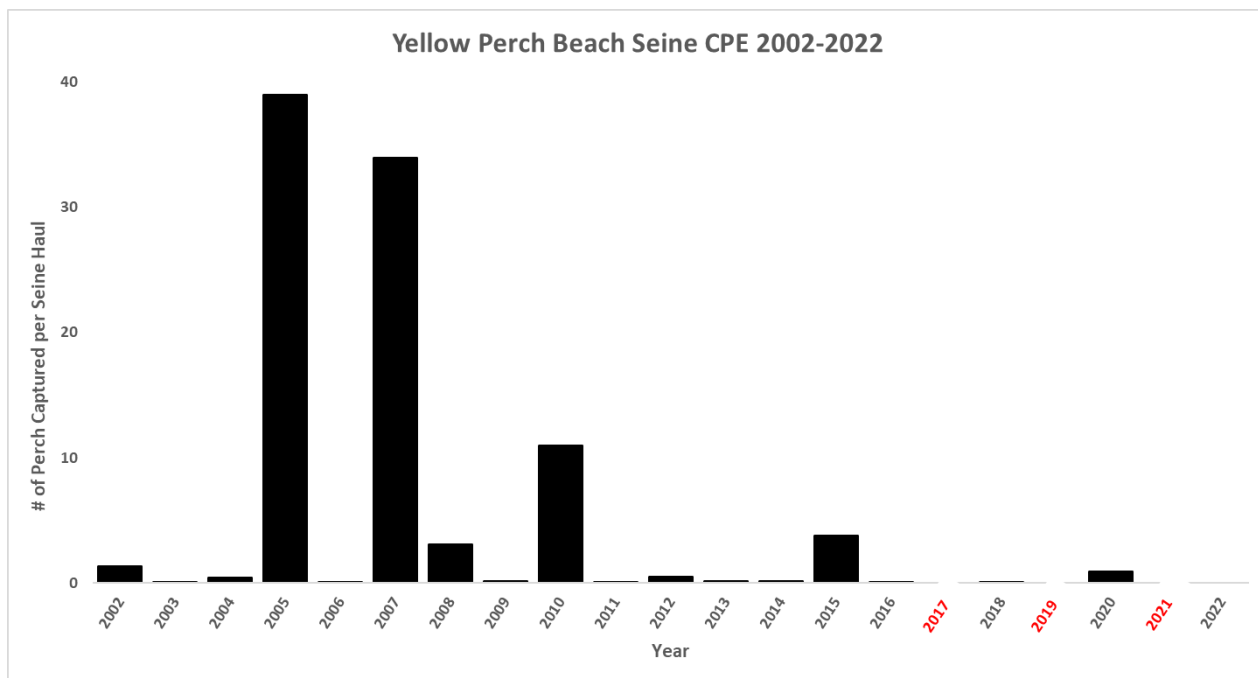


Figure 4. Number of yellow perch captured per seine haul in annual beach seining surveys at index sites from Kenosha to Sheboygan on Lake Michigan from 2002-2022.

**Surveys were not conducted in 2017, 2019 or 2021.*

Winter Graded Mesh Assessment (2023)

SURVEY DATES (DEC. 4 – DEC. 7, 2022)

Our annual winter graded mesh assessment of the yellow perch population in Lake Michigan was conducted between Dec. 4, and Dec. 7, 2022. Historically, this survey would be conducted January of 2023 and labeled as the winter of 2023 survey. However, due to the availability of the boat and marina space, this survey was conducted in December when yellow perch should be schooled in similar locations. This survey will be conducted in early December or late November for the foreseeable future.

The goal for the winter graded mesh survey is to set 20 boxes of nets. Each box of gill net contains one 50-foot panel of each 1.0-inch, 1.25-inch, 1.5-inch, 1.75-inch and one 100-foot panel of each 2.0-inch, 2.25-inch, 2.5-inch, 2.75-inch, 3.0-inch and 3.25-inch stretch monofilament mesh, totaling 800 feet per box. Two or three boxes of nets are then attached at the ends to create a gang. The survey was conducted off the near shore waters of Milwaukee to the north and south using the DNR research vessel RV Coregonus.

In recent years catch has been extremely low. We tested setting nets in different depths in the 2021 survey and caught all four of our perch in one lift on the shallow end of Green Can Reef, in waters slightly shallower than we had been fishing. In the 2022 survey, we set the nets into shallower water than we had historically sampled, and we found more perch, 29 in total.

We tested setting nets in a variety of depths (27-73 feet) again in 2022 and caught a total of six perch in 18,400 feet of gill net effort. For standardization purposes, graded mesh assessment data is often reported as the catch rate per 1,000 feet of equal-length mesh panels. In these terms, our adjusted catch was less than one yellow perch per 1,000 feet of a standardized mesh gill net in the December 2022 graded mesh assessment. The surface water temperature during the sampling period was 39-41°F, which was more than ten degrees colder than the 2021 survey but within the average temperature of historical surveys. Our catch totaled six yellow perch ranging in age from 2 to 7 years old (Table 2), and sizes ranged from 6 to 12 inches.

We maintained our yellow perch graded mesh standard protocol and were able to reach the goal of 20 boxes of effort. In the 2022 survey, we were hopeful that the perch had just moved shallower during our sampling time. However, in the 2023 survey, we did not find an abundance of perch in shallower waters. The catch rates from the 2023 survey remain historically low (Figure 5). We saw fewer cohorts than we did in the 2022 survey (Figure 6). Other species caught included good numbers of round whitefish (332), lake trout (11), burbot, white sucker, longnose sucker, round goby, rock bass and smelt. The nets were not clogged by cladophora, which occasionally occurs in shallower waters. We plan on continuing to set in the shallower water for the graded mesh assessments, and we will continue to compare our catch rates to other agencies within Lake Michigan.

Table 1. Number of yellow perch caught by mesh size in the December 2022 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	0	1	0	1	1	1	0	0	1	1

Table 2. Number of yellow perch caught by age in the December 2022 graded mesh assessment.

Age	1	2	3	4	5	6	7	8	9	10
# of yellow perch	0	2	2	0	1	0	1	0	0	0
Average Length	-	223	185	-	310	-	306	-	-	-

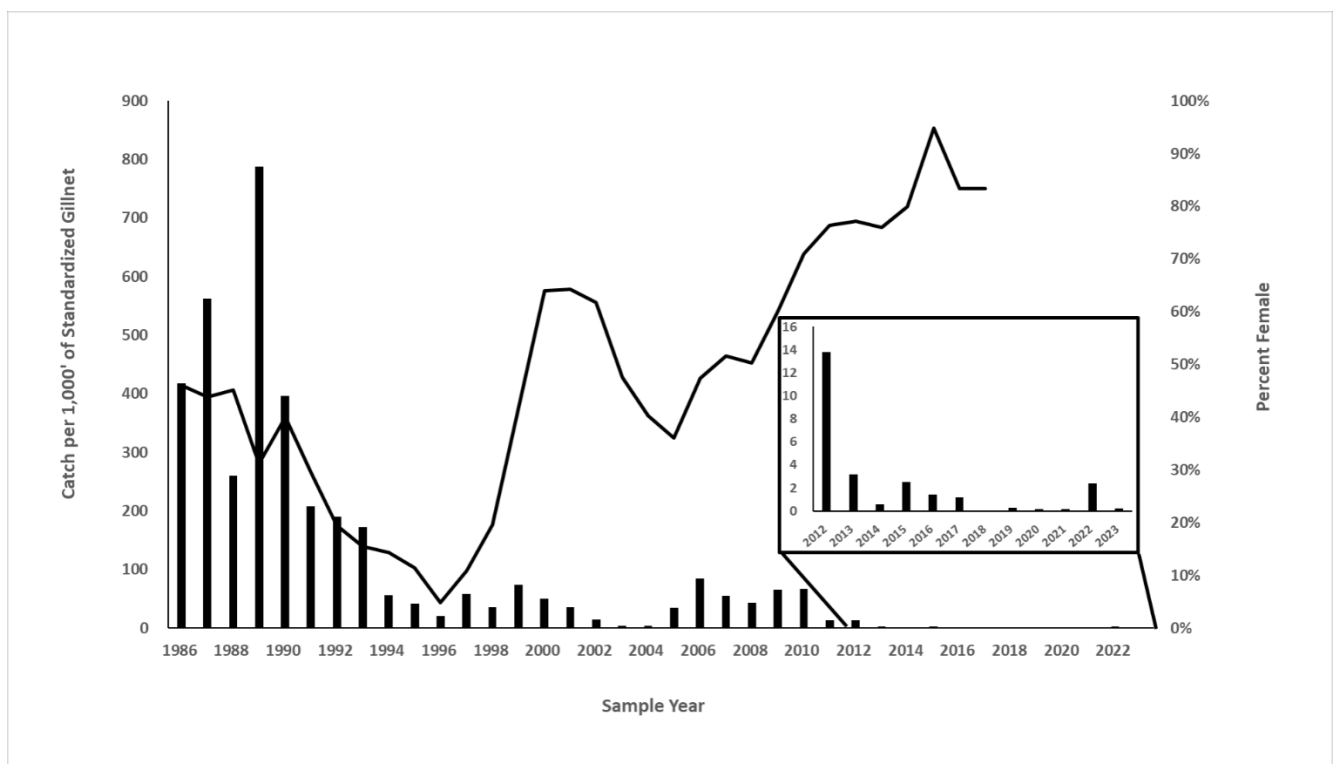


Figure 5. Adult yellow perch standardized CPUE (bars) and percent female (line) in the Wisconsin waters of Lake Michigan winter gill net assessment, Milwaukee, WI, 1986-2023. Percent female calculation ends in 2018 due to insufficient sample size.

**Mesh size and effort has changed over time. This figure standardizes both effort and mesh size to compare recent catches with historical catches using similar gear.*

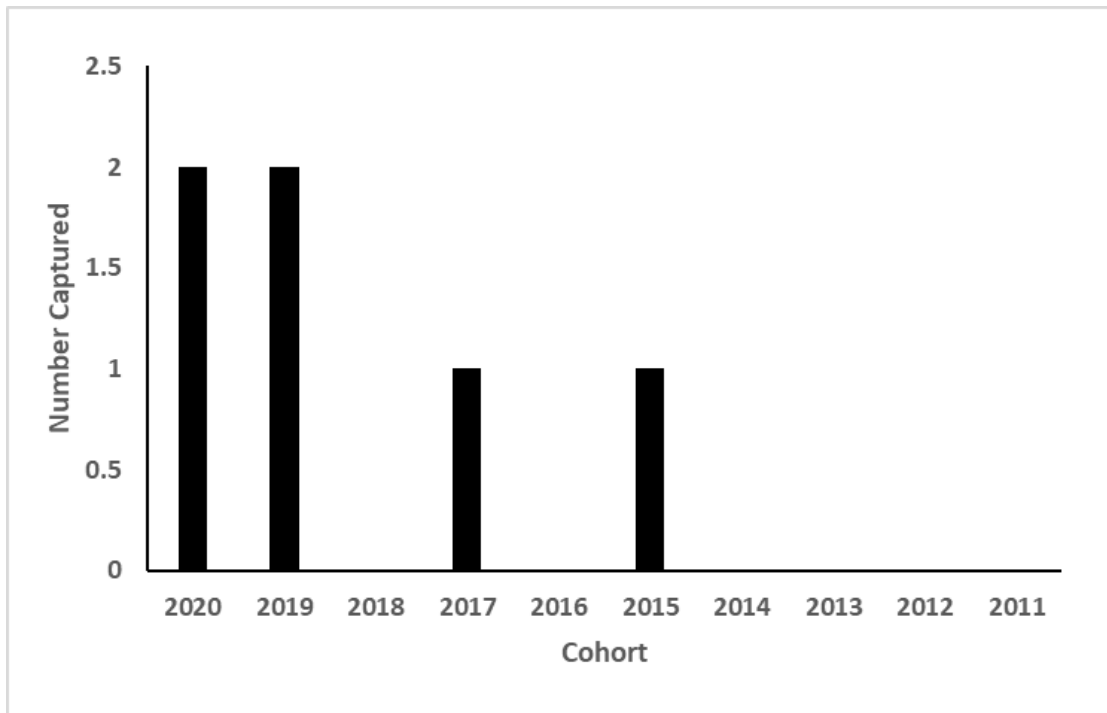


Figure 6. Cohorts of yellow perch captured during annual graded mesh assessment in Milwaukee, WI, 2022.

2022 Survey Year Summary

Yellow perch populations remain low and struggle to produce significant year classes. Yellow perch from the 2016 cohort were captured during the spawning surveys in 2021 and 2022 but were missing from the 2023 graded mesh survey. Although the total catch is low, the 2016 cohort is the most recent successful cohort in the last 10 years. They have been detected in multiple years of spawning surveys and hopefully will be able to contribute to the next significant cohort. Our YOY surveys in recent years have been limited. The data from the graded mesh survey can help fill in data gaps, and some fish from the 2019 and 2020 cohort are being captured, although in low numbers. Overall, the catch remains low, and the population is relying heavily on one or two years of successful recruitment.