

# Yellow Perch and Nearshore Fish Community Dynamics in Michigan Waters of Lake Michigan

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## *Background*

Yellow Perch are an important component of Michigan's sport fishery in Lake Michigan, and play an equally important role in the Lake Michigan biological community. They are a native species that play an important role in energy cycling and transfer, acting as both prey and predators, especially in nearshore waters. Between 1985 and 2014, from approximately 300,000 to 3,000,000 Yellow Perch were caught by Michigan anglers annually, more than any of the other species tabulated by the Fisheries Division's creel census program. While yellow perch are an important component of the Lake Michigan sport fishery, numerous other recreationally, commercially, and ecologically important nearshore species require evaluation and assessment. These include Walleye, Smallmouth Bass, and increasingly numerous exotic invasive species that can have significant effects on sport fisheries in Michigan waters (e.g., Round Gobies).

The objectives of this study are: 1) to assess yellow perch and other recreationally, commercially, and ecologically important fish populations in Michigan waters; 2) to collect and analyze biological data for sport-caught yellow perch, smallmouth bass, and walleye; and 3) to develop decision support tools that will allow managers to forecast the outcome of various management strategies on Lake Michigan nearshore fish populations.

Fisheries Division takes a multi-pronged approach to addressing the study objectives. The R/V (Research Vessel) *Steelhead* sets gill nets to collect yearling and older Yellow Perch at three southern Lake Michigan ports (Grand Haven, Saugatuck, South Haven) and three northern Lake Michigan ports (Arcadia, Leland, Charlevoix) in April-May. Trawling for young-of-year (fingerling) yellow perch is conducted by Charlevoix Fisheries Research Station personnel in August and September from the R/V *Steelhead* and from smaller boats. Ten-minute trawl tows are made at depths from 3 to 100 feet at each of the ports sampled in spring. Trawl sampling gives us our best early indication of year-class strength (successful reproduction in a given year) and provides us with important information on the overall fish community including the presence of exotic species (Photo 1). Smallmouth Bass are sampled near Beaver Island, around Waugoshance Point, and in Grand Traverse Bay using trap nets and tagged for further analysis (Photo 2). Returns of tagged Smallmouth Bass allow us to measure mortality and movement rates for these populations. Finally, collections of Yellow Perch, Smallmouth Bass, and Walleye from the Lake Michigan creel census provide information on how management actions are influencing Lake Michigan nearshore fisheries.



Photo 1. Trawl collections provide an early indication of annual yellow perch reproductive success.

## *Key study results*

- Yellow Perch adult assessment (spring gill nets): Lake Michigan Yellow Perch numbers peaked in the mid- 1980s to early 1990s, followed by significant declines. In recent years, increases in assessment catches of adult Yellow Perch have resulted from recruitment of the 1998, 2002, 2005, and 2010 year classes, with 4-year old (9”) yellow perch most common in the recreational catch.
- Yellow Perch Young-of-the-Year (YOY) assessment: Data collected in trawl surveys indicate that the last excellent production of young-of-year Yellow Perch occurred in many areas of Lake Michigan in 2010. Recent observations consistently show reduced levels of young-of-year Yellow Perch and indices of young Yellow Perch production have been at low levels in nearly all Lake Michigan jurisdictions since 2011. However, early results from 2015 surveys indicate that reproduction this year may be more similar to 2010 than the period from 2011 to 14.
- Yellow Perch harvest: Recreational harvest of Yellow Perch in 2014 was approximately 150,000 fish in Michigan waters and approximately 475,000 fish lakewide. In both cases, these numbers are about half the average annual harvest for the period 2005-2014. Commercial Yellow Perch fishing remains closed on Lake Michigan, except for Green Bay waters.
- Smallmouth Bass results: Assessment catches of Smallmouth Bass at Beaver Island Archipelago sites remains similar to 1970’s levels before the establishment of large populations of Double Crested Cormorants in this area. Average population size of adult Smallmouth Bass at the Garden Harbor index site has fluctuated between 700 and 300 fish, and has exceeded the target goal of 600 adult Smallmouth Bass in most recent years. Analysis of collections from Waugoshance Point and Grand Traverse Bay sites is currently in process.



Photo 2. Two tagged smallmouth bass ready to be released.

## *Detailed Study Information*

Additional detailed study information is available at [http://www.michigan.gov/dnr/0,4570,7-153-10364\\_52259\\_19056-333302--,00.html](http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_19056-333302--,00.html).