

Cisco (Lake Herring) Assessment and Rehabilitation in Michigan

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Background

Historically, Cisco (a type of whitefish) were the most prolific prey fish in the Great Lakes basin, serving as a vital link between top native predators and plankton resources as well as supporting one of the largest freshwater commercial fisheries in North America (Photo 1). Cisco populations are among the most depressed in number of native species of the Great Lakes fish community. Entire populations of these deepwater fishes were eliminated from all five Great Lakes by the 1920s and 1930s. These declines were primarily caused by overharvest, habitat degradation, and competition from nonnative species. A number of whitefish species have been completely eliminated including three species in Lake Michigan, two in Lake Huron, and one in each of lakes Erie and Superior.



Photo 1. A Cisco (Lake Herring) from a Great Lakes fisheries assessment.

There is a renewed interest in the reestablishment of this group of native deepwater fish in lakes Michigan and Huron. Successful reestablishment will require knowledge of the environmental and genetic factors that maintain differences among this species group, information concerning the status of remnant populations, resolution of how to accurately identify the different species, understanding what causes cyclic reproductive success seen in these fish, and the development of effective hatchery methods. Along with understanding this species, work is also being done to improve degraded spawning habitat for Cisco to increase natural reproduction (Photo 2).



Photo 2. Ongoing reef restoration work near Elk Rapids will benefit Lake Michigan Cisco.

The purpose of this project is to provide support for initiation and continuation of Cisco population evaluation and rehabilitation in Michigan waters. The specific objectives are: 1) to

review the status of Cisco stocks in Michigan Great Lakes and inland waters; 2) to support and conduct assessments of Great Lakes Cisco stocks; and 3) to support development of state and regional Cisco restoration plans.

Key study results

- A draft report was prepared on inland Cisco populations (Calabro et al. In review; “Status and history of Cisco *Coregonus artedii* in Lake Michigan and Michigan inland waters”). This report is currently undergoing internal review and will be submitted for publication as a DNR Fisheries Report in 2016.
- Limnological (water chemistry and clarity) and fisheries surveys were completed on two inland lakes to assess habitat conditions and determine if historic populations of Cisco are still present. Limited gill-net surveys did not document the continued existence of Ciscos in Saubee Lake, Eaton County. Additional sampling efforts will be completed on Saubee and Tamarack lakes in Eaton County during November–December 2015.
- Great Lakes Cisco assessments were conducted in fall 2014 (adult assessments) and spring 2015 (juvenile assessments) in Grand Traverse Bay (Lake Michigan) and south (Leland, Platte Bay, Sleeping Bear Bay; Photo 3). During spring and summer 2015, adult and yearling experimental assessments were performed in Grand Traverse Bay and Little Traverse Bay areas (Lake Michigan), in collaboration with the Little Traverse Bay Band of Odawa Indians.
- Results and insights from these assessments were used to develop a draft multiseason assessment protocol (Povolo et al. In review; “Lakewide assessment plan for Lake Michigan Cisco *Coregonus artedii*”) that was presented at the Lake Michigan Technical Committee Meeting on July 22, 2015. Experimental field surveys are continuing through fall 2015, following the sampling designs outlined in the draft assessment protocol.
- Cisco diet data were collected in the spring and fall of 2014. Diet data were analyzed, and preliminary results were presented at the summer 2015 Lake Michigan Technical Committee Meeting. A manuscript describing Lake Michigan Cisco diets was prepared (Povolo et al. In review; “Evaluation of diets from adult Cisco in Grand Traverse Bay, Lake Michigan”), and has been submitted to the Transactions of the American Fisheries Society. Additional collection of Cisco diet data and analysis is ongoing.
- DNR staff participated in lake and lake technical committee meetings for development of Cisco rehabilitation plans including the Lake Michigan Native Planktivore Task Group who is developing a technical report on “Rationale, Prospects, and Recommended Actions for Rehabilitation of Native Forage Fishes in Lake Michigan”.



Photo 3. Sampling gear in place on reef.

Additional Information

More study details can be found on the Fisheries Division website (http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_19056-333302--,00.html) and a DNR “Showcasing” article on Grand Traverse Bay Cisco population is at http://www.michigan.gov/dnr/0,4570,7-153-10366_46403_63473-252442--,00.html. Michigan’s Wildlife Action Plan that supports these efforts is at http://michigan.gov/dnr/0,4570,7-153-10370_30909---,00.html.

Additional information about the Lake Michigan reef restoration work can be viewed at <http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/michigan/explore/grand-traverse-bay.xml>