STUDY PERFORMANCE REPORT

State: Michigan **Project No.:** T-10-T-5

Study No.: 237027 **Title**: Cisco (Lake Herring) *Coregonus artedi* assessment and rehabilitation in Michigan.

Period Covered: October 1, 2014 to September 30, 2015

Study Objectives: (1) To review the status of Cisco stocks in Michigan Great Lakes and inland waters; (2) to support ongoing assessments of Great Lakes Cisco stocks; and (3) to support development of state and regional Cisco restoration plans.

Summary: Data were collected during 2015 on Great Lakes (targeted surveys) and inland lake (through standard, but nontarget, surveys) Cisco populations. Presence-absence data as well as limited biological information has been summarized for Michigan's inland lake populations of Cisco. Great Lakes Cisco population data are summarized in Great Lakes Fishery Commission meeting reports and presentations. Data analysis for 2015 Cisco surveys is ongoing and fall surveys of Cisco are scheduled for Lake Michigan and other populations.

Findings: Jobs 1 through 5 were scheduled for 2014-15, and progress is reported below.

Job 1. Review status of cisco stocks in Michigan Great Lakes waters.–Efforts are underway to review the status of Cisco in each of the Great Lakes, under the auspices of the lake committees (Great Lakes Fishery Commission – GLFC: see, for example, the Lake Michigan Native Planktivore Task Group). Michigan Department of Natural Resources (DNR) project biologists participated in these lake committee efforts to review and evaluate the status of Cisco stocks in lakes Superior, Huron, and Michigan. Evaluations were based on historical literature reports as well as existing data sets (e.g., Great Lakes assessment data housed at the DNR Marquette, Alpena, and Charlevoix fisheries research stations; Statewide Angler Survey Program data; Great Lakes-wide commercial fishery data sets). Presentations and summaries were completed for distribution, abundance, age structure, and other population data where information is available (e.g., Myers et al., in press; "Spatial synchrony in Cisco recruitment").

Lake Michigan data was shared during the Great Lakes Fishery Commission annual meeting on March 21, 2015, as part of the Native Planktivore Task Group report to the Lake Michigan Committee.

Job 2. Review status of cisco populations in Michigan inland waters.–In coordination with Central Michigan University, a draft report was prepared on inland Cisco stocks (Calabro et al., in review; "Status and history of Cisco *Coregonus artedi* 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.

Additionally, limnological 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 reported no Ciscoes in Saubee Lake, Eaton County. Additional sampling efforts will be completed on Saubee and Tamarack lakes in Eaton County during November–December 2015.

Job 3. Provide support for ongoing assessment of remnant cisco stocks in the Great Lakes.– Assessment data specific to Great Lakes Cisco were collected in fall 2014 (adult assessments) and spring 2015 (juvenile assessments) from sites in Grand Traverse Bay (Lake Michigan) and south (Leland, Platte Bay, and Sleeping Bear Bay). 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 design a draft multiseason assessment protocol (Povolo et al., in review; "Lakewide assessment plan for Lake Michigan Cisco *Coregonus Artedi*") 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 will be submitted to the Transactions of the American Fisheries Society in October 2015. Additional collection of Cisco diet data and analysis is ongoing.

Data entry in standardized fisheries survey databases (e.g., Charlevoix Fisheries Research Station survey database) and data analyses are ongoing. Results will be presented in future reports. Additionally, compilation of Cisco sport harvest data is ongoing, in collaboration with the DNR Statewide Angler Survey Program (Federal Aid in Sport Fish Restoration Study 230499, F-81).

Job 4. Develop regional and Michigan-specific Cisco rehabilitation plans.–Department of Natural Resources staff participated in GLFC lake committee and lake technical committee meetings for development of Cisco rehabilitation plans. For example, the Lake Michigan Native Planktivore Task Group is developing a technical report on "Rationale, prospects, and recommended actions for rehabilitation of native forage fishes in Lake Michigan". The target release date for this document is January 2016. Funding from Fisheries Division's portion of the State Wildlife Grant supports DNR research and management biologist participation in development of this document.

Job 5. Write annual performance report.–This progress report was completed as scheduled. In addition, a project summary was prepared (Attachment 1).

Prepared by: Randall M. Claramunt, Shawn Sitar, Scott Hanshue, and Annalise Povolo.
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