

**Distribution and abundance of lake herring
(*Coregonus artedii*) in Michigan**

W. C. Latta

*Institute for Fisheries Research
203 Museums Annex Bldg.
1109 N. University
Ann Arbor, MI 48109-1084*

Abstract.—Lake herring *Coregonus artedii* are, or have been, present in at least 153 lakes in Michigan. A large fraction (49%) of the lakes are in a band across the southern part of the state extending from Oakland County southwest to Cass County, in moraines left by the Wisconsin glacier. Many of the remaining herring lakes are in counties contiguous to the Great Lakes; few are found in interior counties. Although herring lakes vary in size between 20 and 18,770 acres, three-fourths of them are larger than 100 acres. Most of the lakes are oligotrophic and 79% have alkalinities of 105 ppm or greater. The status of the herring populations is unknown in 51 of the lakes. In the remaining 102 it was judged that the population is stable in 80 lakes, declining in 8, and extirpated in 14. Of the latter, it appeared extirpation of herring was caused by habitat deterioration in 6 lakes, competition or predation from other fishes in 4, treatment of the lake with a fish toxicant in 1, and unknown in 3. All herring lakes in Michigan should be protected from eutrophication and any proposed fish introductions should be evaluated.

The lake herring or cisco *Coregonus artedii* is widely distributed in northern North America from upper Mississippi River and Great Lakes basins north to Labrador and northwest to Mackenzie River drainage. It occurs mainly in lakes but also in large rivers and coastal waters of Hudson Bay (Lee et al. 1980). The southern most populations occur in Michigan and Indiana. The lake herring, a member of the trout family, is a slender, silvery fish usually 8 to 12 inches in length. It requires cool, well oxygenated water and is normally found in a water layer where the temperature is 20°C or less and the dissolved oxygen is 3.0 mg/l or more. Frey (1955) called this the "cisco layer." McLain and Magnuson (1988) have defined this layer with a lower temperature (17°C) and a higher oxygen concentration (4 ppm). Maturity

is usually attained at age 3 or 4 and some individuals may live for 12 years or more. Spawning takes place in shallow water in late fall or early winter. Corresponding to its pelagic habitat, it mainly consumes zooplankton. Scott and Crossman (1973) and Becker (1983) provide excellent life history summaries.

In Michigan, the lake herring is classified as a threatened species (Bailey and Smith 1991). However, no systematic effort has been made to evaluate its status in Michigan's inland lakes although in Great Lakes waters its abundance has been monitored frequently (Fleischer 1992). The objective of this study was to tabulate the lakes in Michigan which have, or had, a lake herring population and determine if each population was stable, declining or extirpated.