

## **The Fish Community and Fishery of North Manistique Lake, Luce County, Michigan in 2003–04 with Emphasis on Walleyes**

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### **Introduction**

The Michigan Department of Natural Resources (MDNR), Fisheries Division surveyed fish populations and angler catch and effort at North Manistique Lake, Luce County, Michigan from April 2003 through March 2004. This work was part of the Large Lake Program, which is designed to improve assessment and monitoring of fish communities and fisheries in Michigan's largest inland lakes (> 1,000 acres; Clark et al. 2004).

The Large Lake Program has three primary objectives. First, we want to produce consistent indices of abundance, generally describe the dynamics of the fish populations, and estimate harvest and fishing effort for target species. In this case, target species were defined as those susceptible to trap or fyke nets and/or those readily harvested by anglers. We selected walleyes *Sander vitreus* and northern pike *Esox lucius* as target species in this survey of North Manistique Lake. Consistent indices of abundance are important for detecting major changes in populations over time and among lakes. Second, we want to generate growth and mortality statistics to evaluate effects of fishing on species which support valuable fisheries. Methods to achieve this goal involve targeted sampling to collect, sample, and mark sufficient numbers of fish. Finally, we want to evaluate the suitability of various statistical estimators for describing fish populations in large lakes. For example, we applied and compared three types of abundance and three types of exploitation rate estimators in this survey.

The Large Lake Program maintains consistent sampling methods over lakes and time. This allows us to build a body of fish population and harvest statistics to directly evaluate differences among lakes or changes within a lake over time. North Manistique Lake is the ninth lake to be surveyed under the protocols of the program; thus, we were somewhat limited in our ability to make valid comparisons among lakes. As the program progresses, we will eventually have a large body of netting data collected under the same conditions that will facilitate comprehensive analyses.

### **Study Area**

The surface area of North Manistique Lake is approximately 1,700 acres, with sources disagreeing only slightly on size. Humphrys and Green (1962) estimated 1,722 surface acres for North Manistique Lake by taking measurements from United States Geological Survey (USGS) maps using hand-held drafting tools. Breck (2004) estimated 1,709 acres as the surface area for North Manistique Lake; this estimate was derived from digital analysis of USGS topographical maps.