

The Fish Community and Fishery of Lake Gogebic, Gogebic and Ontonagon Counties, Michigan in 2005-06 with Emphasis on Walleye, Northern Pike, and Smallmouth Bass

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Introduction

The Michigan Department of Natural Resources (DNR), Fisheries Division surveyed fish populations and angler catch and effort at Lake Gogebic, Gogebic and Ontonagon counties, Michigan from April 2005 through March 2006. This work was part of the Large Lakes Program, which is the assessment and monitoring program for fish communities and fisheries in Michigan's largest inland lakes (Clark et al. 2004).

The Large Lakes Program has three primary objectives. The first objective is to produce indices of abundance and estimates of annual harvest and fishing effort for walleye *Sander vitreus*, northern pike *Esox lucius*, smallmouth bass *Micropterus dolomieu*, and muskellunge *Esox masquinongy*. Because these species support valuable fisheries, the second goal is to produce growth and mortality statistics to evaluate the effects of fishing on these species. This involves targeted sampling to collect, sample, and mark sufficient numbers of fish. We selected walleye, northern pike, and smallmouth bass as target species in this survey of Lake Gogebic. The third goal is to evaluate the suitability of various statistical estimators for use in large lakes. For example, comparisons were made among four types of abundance and three types of exploitation rate estimators in this survey of Lake Gogebic. The Large Lakes Program will maintain consistent sampling methods over lakes and time, which will allow the evaluation of differences in fish population and harvest statistics among lakes or changes within a lake over time. Lake Gogebic was the sixteenth lake to be surveyed as part of the Large Lakes Program.

Study Area

Lake Gogebic is a natural lake in Gogebic and Ontonagon counties, Michigan with a watershed of approximately 160 square miles (Eschmeyer 1941a). Reports of the surface area vary from source to source. Eschmeyer (1941a) reported 14,781 acres, Hanes (1961) and Laarman (1976) reported 12,800 acres, FERC (2003) reported 14,080 acres at a maximum operating level of 1,296.2 ft, and Breck (2004) reported 13,127 acres. One goal of the Large Lakes Program is to compare various measures of productivity among lakes, such as number of fish per acre or harvest per acre, so an accurate measure of lake size is important. Thus far in the Large Lakes Program, we have used lake acreages derived using computerized digitizing equipment and USGS topographical maps (Breck 2004). Breck (2004) overlaid the boundaries of lake polygons from a Geographical Information System with aerial photos of the lakes using ArcView®, and the two matched well.

The Lake Gogebic watershed is within the Western Upper Peninsula ecoregion (Eagle et al. 2005). This ecoregion is primarily forested (81%) and wetlands (11%), with some agricultural land (2%), urban land (2%), and a mix (4%) of grassland, shrubland, and alvar (limestone plain with thin