

The Fish Community and Fishery of Lake Michigamme, Baraga and Marquette Counties, Michigan in 2006 with Emphasis on Walleye and Northern Pike

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Introduction

The Michigan Department of Natural Resources (DNR), Fisheries Division surveyed fish populations and angler catch and effort in Lake Michigamme, Baraga and Marquette counties, Michigan from April through September 2006 (Figure 1). This survey was the seventeenth conducted as part of the Large Lakes Program, which is designed to assess and monitor the fish communities and fisheries in Michigan's largest inland lakes (Clark et al. 2004). The Large Lakes Program has three primary objectives that are focused on fish species supporting valuable fisheries (walleye *Sander vitreus*, northern pike *Esox lucius*, smallmouth bass *Micropterus dolomieu*, and muskellunge *Esox masquinongy*). The first objective is to produce indices of abundance and estimates of annual harvest and fishing effort. The second objective is to produce growth and mortality statistics to evaluate the effects of recreational fishing on these species. This usually involves targeted sampling to collect, sample, and mark sufficient numbers of fish. We initially selected walleye, northern pike, smallmouth bass, and muskellunge as target species in the Lake Michigamme survey; however, due to limited catches of smallmouth bass and muskellunge, this report focuses on walleye and northern pike, with only limited mention of smallmouth bass. The final objective 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 Michigamme. The Large Lakes Program maintains consistent sampling methods over lakes and time, which allows comparisons within and among lakes.

Study Area

Located 30 miles west of Marquette, with the town of Michigamme resting on its northwest shore, Lake Michigamme is within the Western Upper Peninsula ecoregion of Michigan (Eagle et al. 2005). This ecoregion is primarily forested (81%) and wetlands (11%), with some agricultural (2%) and urban (2%) land, and a mix (4%) of grassland, shrubland, and alvar (limestone plain with thin soil and sparse vegetation). Forest types include northern hardwoods, aspen, pines, and lowland conifers. The geology of the region consists of igneous and metamorphic bedrock with numerous exposures. Several extensive outwash plains are found within the ecoregion, which contain acidic sand and gravel soils that have little organic material. The relatively nutrient-poor, rocky, acidic soils result in waterbodies with low productivity, of which Lake Michigamme is one. This region also experiences the coldest temperatures, most snowfall, and shortest growing season of any area in Michigan.

Lake Michigamme is 4,360 acres with approximately 36 miles of irregular shoreline and numerous islands are found throughout the lake. The lake reaches a maximum depth of 72 feet, and shallow areas (<15 feet) are limited to less than 20% of the lake's surface area (Figure 2). Lake