

The fish community and fishery of Bond Falls Flowage, Ontonagon County, Michigan in 2003 with emphasis on walleye and northern pike

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Introduction

The Michigan Department of Natural Resources (MDNR), Fisheries Division surveyed fish populations and angler catch and effort on Bond Falls Flowage, Ontonagon County, Michigan from April 2003 through October 2003. 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 (Clark et al. 2004).

The Large Lake Program has three primary objectives. The first objective is to produce consistent indices of abundance and estimates of annual harvest and fishing effort for walleye, northern pike, smallmouth bass, and muskellunge. These species were selected since they are susceptible to trap or fyke nets and are readily harvested by anglers. The intent is to produce statistics for important fishes to help detect major changes in their populations over time. The second objective is to produce abundance estimates and sufficient growth and mortality statistics to be able to evaluate effects of fishing on those species which support valuable fisheries. This usually involves targeting species with nets or other gears to collect, sample, and mark sufficient numbers. I selected walleyes *Sander vitreus* and northern pike *Esox lucius* as target species in this survey of Bond Falls Flowage. The final objective is to evaluate the suitability of various statistical estimators for use in large lakes. For example, in the current survey I applied and compared two types of abundance and three types of exploitation rate estimators.

I will refer to fishes by common name in the text. Common and scientific names of fish species are listed in the Appendix.

Study Area

Bond Falls Flowage is located on the Middle Branch Ontonagon River, and has a surface area of approximately 2,100 acres. According to the Michigan Digital Water Atlas (Breck 2004), the area of Bond Falls Flowage is 2,127 surface acres, while the Upper Peninsula Power Company (UPPCo) 1987 license application reported 2,160 acres at maximum operating level (UPPCo 1987). In this report, I used the modern acreage of 2,127 for calculating fish density estimates. The Upper Peninsula Power Company (2006) reported 1,836 and 1,574 acres of usable surface area, when 100-ft and 200-ft buffers were considered. Usable surface area is the total surface area of the impoundment at full pool, minus the area considered unacceptable for boating purposes. The shoreline length is approximately 20.2 miles, not including islands (UPPCo 2006). The maximum depth is 40 ft, which occurs where the reservoir inundated natural lakes such as Calderwood and Jesse James. Although bathymetric data about the reservoir is lacking, UPPCo (1985) reported area-capacity curves based on data they received when they assumed ownership of the facilities. The gross storage capacity of the reservoir is