

**Status of Yellow Perch and Walleye Populations
in Michigan Waters of Lake Erie, 1994-98**

Michael V. Thomas and Robert C. Haas

*Michigan Department of Natural Resources
Mount Clemens Fisheries Research Station
33135 S. River Road
Harrison Township, MI 48045*

Abstract.—We investigated the fish community and population dynamics of yellow perch *Perca flavescens* and walleye *Stizostedion vitreum* in Michigan waters of Lake Erie. This study was conducted from 1994 to 1998, but information from previous years is considered in the analyses. Results of index trap-net and gill-net surveys, catch-at-age analysis of survey and sport fishery data, and analysis of walleye tag-recapture data were examined. For yellow perch, index trap-net data suggested a decline in abundance, while catch-at-age analysis indicated a period of decline with a slight recovery of abundance after 1996. Catch-at-age analysis produced mean estimates for annual survival (0.55), instantaneous fishing mortality (0.19), and annual exploitation (0.14) for yellow perch in Michigan waters of Lake Erie. For walleye, index trap-net data revealed no trend in walleye abundance during the period. However, index gill-net data suggested a steady decline in walleye abundance from 1994 to 1997. Catch-at-age analysis for walleye indicated a general decline in the abundance of age-2 and older fish from 1989 to 1994, and a slight recovery from 1995 to 1998. Catch-at-age analysis produced mean estimates of annual survival (0.65), instantaneous fishing mortality (0.27), and annual exploitation (0.21). Possible explanations for the differences between index survey and catch-at-age analysis abundance trends for both walleye and yellow perch included: a suspected increase in gear avoidance due to increased water clarity; an inherent weakness in catch-at-age analysis in estimating the numerical abundance of cohorts newly recruited to the fishery; and a suspected change in vertical distribution affecting walleye vulnerability to the index gill nets. Analysis of walleye tag-recapture data also produced mean estimates of walleye survival (0.74) and annual exploitation rate (0.11), as well as annual natural mortality (0.17). Possible factors in the differences between the two sets of parameter estimates for walleye were the longer time series of data and wider geographic area included in the tag recovery analysis. Walleye tag recovery data were plotted showing obvious strong northward and eastward movement patterns. Walleye tagged in the Huron River were recovered further north than those tagged at Monroe. Based on the results of this study, management actions recommended for Lake Erie percids include: no change in existing Michigan sport fishing regulations for yellow perch or walleye; collection of spatially-explicit fishing effort data for Lake Erie, the St. Clair River, Lake St. Clair, and the Detroit River; repeating an interagency reward tag study of walleye; and initiation of efforts to restore populations of native lake sturgeon, lake herring, and Great Lakes muskellunge. Future research directions identified include: continuation of genetic efforts to quickly and inexpensively identify stock of origin for walleye based on scale samples; and investigation of ecological effects of newly-introduced exotic species in Lake Erie.