

Status of Yellow Perch and Walleye in Michigan Waters of Lake Erie, 1999–2003

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Abstract.—We investigated population dynamics of yellow perch *Perca flavescens* and walleye *Sander vitreus* in Michigan waters of Lake Erie. This study was conducted from 1999 to 2003, 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 walleye tag-recapture data were examined. For yellow perch, index trap-net data suggested an increase in abundance. Similarly, catch-at-age analysis indicated yellow perch abundance increased markedly after 1995. Catch-at-age analysis produced mean estimates for survival (0.57), instantaneous fishing mortality (0.16), 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 2000 to 2003. Catch-at-age analysis for walleye indicated a general decline in the abundance of age-2 and older fish after 1996, with abundances of less than 20 million fish estimated for 1997, 1999, 2000, and 2002. Catch-at-age analysis produced mean estimates of survival (0.55), instantaneous fishing mortality (0.29), and annual exploitation (0.16). Analysis of Michigan, Ohio, and Ontario walleye tag-recapture data for 1999–2003 also produced mean estimates of walleye survival (0.59), instantaneous fishing mortality (0.16), annual exploitation rate (0.13), as well as natural mortality (0.36). A possible factor in the differences between the two sets of parameter estimates for walleye was the wider geographic area included in the tag recovery analysis. Maps of walleye tag recovery data showed strong northward and eastward movement patterns. Walleyes tagged near Monroe showed very similar movement patterns compared to tagging sites in Ohio and Ontario. Based on the results of this study, management actions recommended for Lake Erie percids included: no change in existing Michigan sport fishing regulations for yellow perch, continued restrictive sport fishing regulations for walleye until recruitment improves, and repeat an interagency reward tag study of walleye on a regular 5-year cycle.

Introduction

Walleye *Sander vitreus* and yellow perch *Perca flavescens* have been the highest valued sport and commercial species in Lake Erie over the last 50 years. In Michigan waters of Lake Erie, walleye and yellow perch routinely account

for over 80% of the total number of fish harvested by the sport fishery. Sport angling pressure in Michigan waters of Lake Erie ranged from 2 to 4 million hours annually from 1986 to 1990 (Rakoczy 1992; Rakoczy and Rogers 1987, 1988, 1990, 1991), but declined to about 1 million angler hours annually from 1991 to 1994