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Status Of Yellow Perch And Walleye In Michigan Waters Of Lake Erie, 1989-93

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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 1989 to 1993, but information from previous years was considered in the analyses. For yellow perch, index trap-net data suggested a decline in abundance with a slight increase in growth during the period. Catch-at-age analysis for yellow perch indicated an initial decline followed by an increase in abundance during the same period. Catch-at-age analysis produced mean estimates for survival (0.62), instantaneous fishing mortality (0.08), and annual exploitation (0.06) 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 sharp decline in walleye abundance from 1989 to 1993. Catch-at-age analysis for walleye indicated a decline in the abundance of age-2 and older fish from 1989 to 1991, and a slight increase in 1992 and 1993. Catch-at-age analysis produced mean estimates of annual survival (0.53), instantaneous fishing mortality (0.32), and annual exploitation (0.23). Possible explanations for the differences in abundance trends between index survey and catch-at-age analyses 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; an increase in growth rates for yellow perch, particularly for age-2 fish; and a suspected change in vertical distribution affecting walleye vulnerability to index gill nets. Analysis of walleye tag-recapture data also produced mean estimates of walleye annual survival (0.64) and exploitation rate (0.09), as well as instantaneous natural mortality (0.34). 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 indicated 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 included: no change in existing Michigan sport fishing regulations for yellow perch or walleye; and collection of spatially explicit fishing effort data for Lake Erie and the St. Clair River, Lake St. Clair, and Detroit River. Future research directions identified included: collection of yellow perch fecundity data from MDNR spring trap-net samples; continuation of the interagency $100.00 reward tag study; and continuation and support of genetic efforts to quickly and inexpensively identify stock of origin for walleye based on scale samples.