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Response of Yellow Perch to Changes in the Benthic Invertebrate Community of Western Lake Erie

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Abstract

In the western basin of Lake Erie, benthic invertebrate abundance and community composition have changed dramatically over the past five decades, as have abundance and growth of yellow perch Perca flavescens. Before 1950, large benthic invertebrates dominated the benthic community of the western basin. Yellow perch readily consumed Hexagenia larvae, caddisfly larvae, amphipods, chironomids, and zooplankton. From 1960 through 1980, large-bodied benthic invertebrates were eliminated from the western basin, and yellow perch relied primarily on smaller chironomids and zooplankton as forage. Growth rates and abundance of yellow perch declined through this period in the western basin, in part because of food limitation. From the late 1980s through the 1990s, large benthic invertebrates, including Hexagenia spp., caddisfly larvae, and amphipods recolonized the basin, and yellow perch again readily consumed

them. Additionally, daily food consumption by adult yellow perch in the 1990s was marginally more than in the 1980s, suggesting that submaintenance feeding episodes were less frequent. In recent years, yellow perch growth rates have increased modestly, and yellow perch abundance has rebounded. The growth rate of age-3 yellow perch during the year before spawning explained 49% of the variation in age-0 recruitment, indicating that adult growth and condition may influence recruitment. We suggest that increases in benthic macroinvertebrate abundance are responsible, in part, for the increases in yellow perch growth and recruitment. We also suggest that yellow perch diets are a useful indicator of changes in the benthic community.

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