ABSTRACT

COMPETITION BETWEEN WHITE SUCKER (*CATOSTOMUS COMMERSONI*) AND YELLOW PERCH (*PERCA FLAVESCENS*): RESULTS OF A WHOLE-LAKE MANIPULATION

By

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The effects of competition with white sucker (*Catostomus commersoni*) on yellow perch (*Perca flavescens*) population dynamics and the mechanisms involved were determined experimentally by removing adult white suckers from Douglas Lake, Michigan during 1987 with trap nets. Yellow perch abundance, growth, diet, feeding rate, fecundity and survival and prey abundance were examined two years prior to sucker removal and three years following treatment. A nearby lake, Little Bear Lake, served as a reference lake to account for trends in perch population characteristics due to weather or other factors which would affect lakes in this region. In these lakes, the axis of competition was determined to be benthic invertebrates. The predominant prey item of adult suckers were chironomid larvae and *Caenis*. Following sucker removal, a 13 to 19 fold increase in the abundance in these taxa were observed. In Little Bear Lake over the same time period, *Caenis* showed a 33% decline in numbers and chironomid larvae showed a 2.2 fold increase, suggesting that increases in benthic invertebrate abundance in Douglas Lake were due to sucker removal. Coincident with increasing abundance of chironomid

larvae and Caenis was an increase in the utilization of benthic invertebrates and a decline in the utilization of zooplankton by adult yellow perch in Douglas Lake. Further, this shift resulted in increased stomach fullness, feeding rate and growth of adult yellow perch in Douglas Lake. These changes did not occur immediately following sucker removal, but required one to two years to develop. In Little Bear Lake, no trend in diet composition was observed, and variations in stomach fullness, feeding rate and growth were small compared to changes in these parameters observed in Douglas Lake, again suggesting that the results obtained in Douglas Lake were due to sucker removal. Although higher growth rates were observed in Douglas Lake, the size structure of the yellow perch population showed only a small increase in the proportion of fish greater than 150 mm. As such, other management techniques should be considered in addition to sucker removal for improving the growth rate of yellow perch populations.