ABSTRACT

In Saginaw Bay, Lake Huron a higher catch per unit effort of channel catfish *Ictalurus punctatus* in recent years has prompted commercial fishermen to request the Michigan Department of Natural Resources to allow them to increase their fishing effort. Previous studies on the potential for increasing commercial harvest were incomplete or are dated, so a new study was needed. Of 2,460 channel catfish tagged in the Wild Fowl Bay area of Saginaw Bay in 1985, 277 tags were returned by sport and commercial fishermen. A catch curve constructed using data collected by sampling catfish from commercial trap nets in three management grids in the bay revealed that instantaneous total mortality rate for catfish in Saginaw Bay was 0.45, down from 0.67 in 1971 and 1981. An instantaneous fishing mortality rate of 0.26 and an instantaneous natural mortality rate of 0.19 were determined by partitioning the instantaneous total mortality rate using tag returns. A commercial reporting rate of 45% was determined by sampling the commercial catch for unreported tagged fish. Comparison of mean backcalculated lengths at age with previous studies revealed a decline in growth rate of catfish. A dynamic pool model indicated commercial fishing effort could be increased to obtain greater yields. Greatest increases in yield could be achieved by increasing both the commercial size limit and effort. Sensitivity analysis indicated that instantaneous total mortality rate, commercial reporting rate, and von Bertalanffy growth parameters were most important in determining the levels of commercial

fishing effort and commercial size limit to maxmize yield. Increasing the commercial size limit to 406.4 mm (16 in) was recommended to increase total, commercial, and sport yield per 1000 recruits, 2.6%, 0.6%, and 9.1%, respectively.