ABSTRACT

Channel catfish Ictalurus punctatus ranked second in weight harvested by commercial fishermen (231,000 kg), and third in number caught by sportfishermen (60,000) in Saginaw Bay in 1981. The commercial fishery employs trap nets, seines, and set hooks. Mean annual catch per unit effort for all gear types has increased in the past decade, in comparison to prior decades, and has lead commercial fishermen to request licensing of additional gear. The commercial fishery was assessed using a dynamic pool model, and an extension of the model was used to investigate the dynamics of gear competition. Growth and total mortality parameters, estimated from four management areas, were pooled for model analysis since no significant differences in these vital statistics were detected after the age of complete recruitment to the fishery. Parameters of the von Bertalanffy growth equation were estimated using mean back-calculated lengths at age derived from fin spine sections. Total instantaneous mortality was estimated from the slope of the descending limb of a catch curve. Fishing mortalities for each commercial gear type and for sportfishing gear were estimated by partitioning the total fishing mortality in proportion to the catch from that gear. Pooling all areas yielded a von Bertalanffy equation of the form $L_x = 921(1-e^{(-0.09(x-0.35))})$, and a total instantaneous mortality of 0.67. Model predictions indicated that yield

to the commercial fishery and to the sport fishery could be increased by increasing the minimum commercial size limit and/or reducing the commercial fishing mortality. Simulations also indicated that an increase in fishing mortality by any one gear type increased yield to that gear type, but reduced yield to all other gear types. The tenuous nature of the estimates of sportfishing mortality and natural mortality preclude specific management recommendations.