

ABSTRACT

A smallmouth bass population which spawns in west-central Anchor Bay of Lake St. Clair was studied by netting and tagging from 1971–85, as well as by an intense on-site creel census in 1983–85.

Anchor Bay smallmouth bass grew faster than populations to the north and slower than some lake populations farther south. It was concluded that this rate of growth primarily relates to the temperature regime associated with the latitude.

The majority of bass tagged in Anchor Bay remained within that part of the lake. Significant numbers migrated into the St. Clair River as opposed to relatively few that moved into southeastern Lake St. Clair or the Detroit River. Estimates of survival and exploitation rates were independently generated from the tagging and recapture data. Estimated annual total mortality rate (0.58) of Anchor Bay bass was of intermediate level, while the conditional natural mortality rate (0.52) was the highest, and the conditional fishing mortality rate (0.13) was the lowest compared to eight other widely distributed populations. It is suspected that angler tag returns were generally under-reported, even with adjustment, resulting in unrealistically low estimates of exploitation and too high estimates of natural mortality.

The catch of adult smallmouth bass per net lift (CPUE) rose substantially in the years after the minimum size limit of bass was raised from 254 mm to 305 mm in 1976. It was concluded from this evidence that there had been a real increase in adult bass abundance. However, the reason for the increase in CPUE was not clear. Two factors, one biological and the other environmental showed correlation with the increased CPUE. The raising of the minimum size limit, by virtue of extending protection from exploitation to larger and older bass, was correlated and, in addition, correlation was noted relating the CPUE of age-4 bass to the June water temperature conditions present at their birth and early development.

Yield-per-recruit (Y/R) analyses predicted that maximum yield would occur at the minimum size limit considered (254 mm) for the period before as well as after the size limit increased. Yield, at the existing levels of estimated fishing mortality, was about the same for both periods.

Daily creel limit, size limit, or season changes are the most obvious options that could be used in any attempt to maximize bass harvest. However, it was not obvious that any of these would increase the present high abundance of adult bass. It was concluded that the most desirable scheme for the management of Lake St. Clair smallmouth bass is the present set of regulations.