

ABSTRACT

The yellow perch (Perca flavescens) population from Saginaw Bay has historically supported a large commercial fishery. Presently the population, which is dominated by small, unharvestable fish, exhibits both slow growth and high mortality past age four. Large energetic costs associated with reproduction and parasitism have a negative effect on yellow perch body growth and survival. Most somatic growth occurred between spawning (May) and onset of gonad production (August). Percent water (visceral and somatic) decreased from June-August, suggesting some seasonal storage of lipids by yellow perch. Surplus body energy was depleted after August as gonads matured and parasite incidence increased. Surplus body energy, condition, and parasite incidence varied by location within inner Saginaw Bay. Yellow perch collected from deeper sites (Au Gres and Blackhole) had more surplus body energy than perch from the shallow, eutrophic Wildfowl Bay. Females grew faster than males after maturation but also contained more water (%) in both the viscera and soma. Back-calculation analysis showed strong evidence for negative size-selective mortality where only the largest individuals from each cohort survived to age five or six. These results suggest that energy depletion mortality may be more significant than fishing mortality in

determining the present population structure found in yellow perch from Saginaw Bay. The interrelationship between large reproductive costs, slow growth, and high adult natural mortality was investigated here.