ABSTRACT

The walleye population of Manistee Lake was supplemented by stocking with fry, small fingerlings (2–3 inches), and large fingerlings (4–7 inches) from 1968 to 1984. Intensive sampling was done with trap nets annually from 1973 to 1978 and 1981 to 1984 to determine the density, growth, and survival of walleye and all other fishes.

First-year survival estimates were 28% for large yearling walleyes stocked in spring, 24% for large fingerlings stocked in summer or fall, and 14% for small fingerlings stocked in summer. Survival averaged 58% per year thereafter. Based on the characteristics of the population and fishery, it was calculated that 3.3% of the large fingerlings and 1.9% of the small fingerlings would eventually be harvested by anglers. A modest walleye population (1.5 to 7.2 pounds per acre) and fishery were maintained by stocking. Poor natural reproduction over the last 3 decades was linked to marginal spawning habitat and weather but could not be fully explained.

Large changes in species populations were observed but total fish biomass remained close to 47 pounds per acre. Bluegill, pumpkinseed, and northern pike populations peaked in the mid-1970's, then were replaced by yellow perch and walleye. The biomass of adult perch increased from less than 1 to over 20 pounds per acre due to improved recruitment, growth, and (probably) survival. Growth of walleye and smallmouth bass declined as perch shifted from small to large average sizes and the numerical density of walleye increased. Some of the population changes were attributed to predation, competition, and the effects of weather on the recruitment of young fish.

It was recommended that managers rear more large fingerling walleyes if they can be produced for less than 8¢ each or less than twice the cost of small fingerlings. Large fingerlings should be selected over small ones for maintenance stocking into communities already close to carrying capacity. Returns can be optimized by stocking every second or third year, rather than consecutively, at average rates not to exceed 12 large or 30 small fingerlings per acre per year.