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Status of Lake St. Clair Submerged Plants, Fish Community, and Sport Fishery

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Abstract.–Lake St. Clair is located near the geographical center of the Great Lakes and is bisected by a commercial shipping lane and an international boundary. With a large human population in close proximity, the lake provides economically and socially important recreational opportunities for the people of southeast Michigan. The fish community of the lake is an important recreational resource. Since the early 1980s, the lake underwent invasions of white perch, spiny water flea, zebra mussel, round goby, and tubenose goby. Their initial impacts on this resource have been documented, but the long-term and cumulative effects remain uncertain. Using trawls and trap nets to sample fish populations, hydroacoustics and hook tosses to sample aquatic plants, and an angler diary program to collect data on sport fishing effort and catch, this study documents the status of the fish community and important fish habitat, primarily submergent plants, in the lake between 2002 and 2006. A total of 34 fish species were represented in the trawl survey. Yellow perch densities were highest in June trawls and age-specific densities indicated highly variable recruitment, with a strong cohort produced in 2003. Smallmouth bass recruitment was also variable, but age-0 densities and mean lengths were high in 2005 and 2006, suggesting those cohorts should be strong contributors to the fishery in future years. A total of 25 fish species were encountered in the trap net survey from 2002 to 2006. Rock bass were the most abundant species, but large predators such as smallmouth bass, channel catfish, walleye, muskellunge, and northern pike were also important components of the catch. While age distribution of smallmouth bass and walleye suggested variable recruitment, muskellunge and northern pike recruitment appeared more stable. The channel catfish population was dominated by large individuals and offers trophy fishing opportunities. Recoveries of tagged smallmouth bass reported by anglers were largely confined to Lake St. Clair. In contrast, anglers reported catching walleye tagged at the Anchor Bay site from locations as far north as the St. Clair River at Port Huron, and as far south as Maumee Bay, Lake Erie. The angler diary catch rates reflected the recruitment of the 2003 walleye and yellow perch cohorts to the fishery in 2005 and 2006. Muskellunge catch rates appeared to decline, possibly reflecting impacts of disease in the population. In this study, we monitored the benthic plant community in Lake St. Clair during the period from 2003 through 2007 with weighted hook sampling and hydroacoustic gear. A total of 22 species of aquatic plants were encountered during the plant survey. Four species dominated the submerged macrophyte community. In combination, muskgrass, wild celery, Richardson's pondweed, and common naiad accounted for 75% of the total wet weight sampled.

Introduction

Lake St. Clair is centrally located in the connecting channel between Lake Huron and Lake Erie in the Laurentian Great Lakes (Figure 1). The interface between the St. Clair River and Lake St. Clair is a unique freshwater delta system with expansive marshes. For decades, the lake supported a sport fishery renowned for smallmouth bass, muskellunge, walleye, and yellow perch (see Appendix 1 for scientific