

## Evaluation of the Effects of the Herbicide Sonar on Sport Fish Populations in Michigan Lakes

James C. Schneider

Michigan Department of Natural Resources  
Institute for Fisheries Research  
211 Museums Annex Building  
Ann Arbor, Michigan 48109-1084

*Abstract.*—The effects of applications of Sonar A.S.® on populations of bluegill *Lepomis macrochirus* and other species of fish were monitored at nine Michigan lakes for up to six years. Monitored population attributes included trap net catch per effort of larger size fish, average length, size composition, growth, and year class strength. Two additional lakes were surveyed less intensively, and four unaltered lakes served as reference sites. Most Sonar treatments eliminated nearly all Eurasian milfoil and other macrophytes for approximately a year, but often the loss of fish cover was partially ameliorated by increases in *Chara* or *Vallisneria*. Modest responses occurred in most fish populations, many of which were statistically meaningful. From a fisheries perspective, all lake responses except one were improvements because all treatment lakes except one had a history of small-size, slow-growing, over-abundant bluegills. Bluegill size and growth characteristics significantly ( $P < 0.25$ ) improved for 29 comparisons, remained the same for 3 comparisons, and declined for 3 comparisons. The composite bluegill size score improved from poor to average at five lakes but remained poor at three severely stunted lakes. Bluegills as large as 7 inches total length increased in abundance, but bluegills as large as 8 inches remained sparse. Improvements in size of pumpkinseed *Lepomis gibbosus* and black crappie *Pomoxis nigromaculatus* were also noted for most lakes. Year class strength in the treatment year(s) may have been slightly reduced for a few lakes. Results demonstrated the resiliency of sport fish population dynamics over a broad range of habitat perturbations. Fish populations with normal or good growth and lower density and recruitment may not respond favorably to macrophyte alteration.

Beginning in 1987, a new herbicide named Sonar A.S.® (hereafter referred to as Sonar) was permitted for control of nuisance growths of aquatic macrophytes in Michigan lakes (Kenaga 1992). Nuisance plants of primary concern were two species that are not native to the state, Eurasian water milfoil *Myriophyllum spicatum* and curlyleaf pondweed *Potamogeton crispus*. Both form dense beds which may canopy on the surface of the lake, hindering boating and other recreational uses and crowding out desirable native plants. In shallow, clear-water lakes,

these exotics may choke large areas 3 to 15 feet deep.

Early treatments with Sonar devastated all types of rooted aquatic plants – not only submerged macrophytes, but also floating and emergent macrophytes – for two or more years (Kenaga 1992). These treatments, at concentrations over 20 ppb, were at much lower levels than the label-recommended rate of 150 ppb. Biologists, naturalists, and even many boaters were alarmed by Sonar's powerful effect