

Use of 230-V AC Electrofishing for Mark-Recapture Studies of Warmwater Fish

James C. Schneider

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

Abstract.—The effect of electrofishing on survival and growth of several species of warmwater fish was evaluated under field conditions. The electrofishing gear had an output of 230-volts, 3-phase AC, and 2-7 amps. Shocked fish held in live cages or a pond experienced little or no mortality in 1-40 days. Tag recapture data for largemouth bass and walleye indicate survival and growth of shocked fish after 1-2 years was not different than fish captured by trap nets or angling. I conclude that 230-volt AC electrofishing can be a practical method to capture many warmwater species for mark and recapture studies in lakes with alkalinities of 26-144 ppm (conductivities of 66-520 micromhos/cm). Output amperage should be regulated so that fish are only briefly stunned.

Long-term, intensive studies of fish population dynamics require that large samples of fish be easily captured, marked, and released unharmed back into the wild. Further, after release these fish should survive, grow, and behave normally. All three basic types of electrofishing gear—AC, pulsed DC, and continuous flow (unpulsed) DC—are used to collect fish, depending on species sought and type of habitat. For example, within the Michigan Department of Natural Resources, through many years of practical experience, continuous 230-volt DC became accepted as the preferred gear for wadeable streams (especially for salmonids) and 230-volt AC became accepted as the most effective gear for lakes (especially for warmwater species). Technically, the unpulsed 230-volt DC is "rippled" because it is obtained by rectifying 230-volt, 3-phase AC. In the last decade, pulsed DC gear has been increasingly used in Michigan to sample small streams

(backpack shockers), and rivers and lakes (boat "boom" shockers).

Despite the widespread use of AC gear for warmwater species in Michigan and throughout the country (Reynolds and Simpson 1978; Heidinger et al. 1983; Bayley et al. 1989), little information has been published on its effects on fish survival and growth under field conditions. An extensive literature already indicates DC gear is a good tool for ecological studies of salmonids under most conditions (e.g., Gatz et al. 1986; Pratt 1955; Mesa and Schreck 1989; Shetter et al. 1969), albeit with some risk of causing spinal deformity in large trout (Sharber and Carothers 1988). However, there is widespread concern about AC gear because it is more likely to cause death or spinal injury in salmonids (Taylor et al. 1957) and, under certain conditions, in warmwater species (Spencer 1967; Newburg 1974). On the other hand, Hudy (1958) reported less than a 2%