

Relationships Between Habitat and Fish Density in Michigan Streams

Troy G. Zorn

*Michigan Department of Natural Resources, Marquette Fisheries Research Station
484 Cherry Creek Road, Marquette, Michigan 49855*

Paul W. Seelbach

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

Michael J. Wiley

*University of Michigan, School of Natural Resources and Environment
Ann Arbor, Michigan 48109-1115*

Abstract.—We developed simple decision support tools (plots) for fishery managers in Michigan that are based on habitat data and fish population estimates for several hundred stream sites throughout the state. We generated contour plots to show patterns in fish biomass for over 60 common species (and 120 species grouped at the family level) in relation to axes of catchment area (CA) and low-flow yield (LFY; 90% exceedance flow divided by CA), and then against axes of mean and weekly range in July temperature. The plots showed distinct patterns in fish density at each level of biological organization studied and were useful for quantitatively comparing river sites. Contour plots were also made for fish assemblage attributes such as species richness and total density. We demonstrated how these plots can be used to support stream management and provided examples pertaining to resource assessment, trout stocking, angling regulations, chemical reclamation of marginal trout streams, indicator species, instream flow protection, and habitat restoration. These tools are electronically available, so managers can easily access and incorporate them into decision protocols and presentations.