

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-3

Study No.: 680

Title: Patterns in community structure, life histories, and ecological distributions of fishes in Michigan rivers

Period Covered: October 1, 2001 to September 30, 2002

Study Objectives: 1) To develop models that explain abundance patterns of the most common fishes in Lower Michigan streams; 2) to evaluate the role of landscape-scale characteristics of streams in favoring fishes having particular life history characteristics; 3) to develop an atlas describing the geographic and ecological distributions of fishes in Lower Michigan streams.

Summary: I identified 113 Michigan Rivers Inventory (MRI) sites in Michigan's Lower Peninsula that had population estimates for either salmonids or the entire fish assemblage but lacked data characterizing summer stream temperatures. Electronic temperature recorders were placed into rivers at 56 MRI sites to obtain hourly readings in July 2002. Research reports describing predictive models for common fishes and causal relationships among fishes and habitat were completed.

Findings: Jobs 3 and 5 were scheduled for 2001-02, and progress is reported below.

Job 3. Title: Obtain temperature and fish data as necessary.—I identified 113 Michigan Rivers Inventory (MRI) sites in Michigan's Lower Peninsula that had population estimates for either salmonids or the entire fish assemblage. Electronic temperature recorders were placed into rivers at 56 MRI sites to obtain hourly readings in July 2002 (Figure 1). Recorders will be recovered in fall 2002 and the data downloaded and summarized for use in developing an atlas relating July temperature characteristics to standing crops of fishes.

Job 5. Title: Write report.—Modeling of fish assemblages in lower Michigan rivers has been completed. Findings are detailed in three chapters of a Ph.D. dissertation (Zorn 2002). The first chapter was completed under SFR Study 631 and has been previously published (Zorn et al. 1998; Zorn et al. 2002). The second chapter described species-specific models developed for the 68 most common stream fishes in lower Michigan. The third chapter used covariance structure analysis to disentangle collinearities among abiotic and biotic variables, and to assess the influence of sample set selection on relationships between fish standing crops and various abiotic and biotic factors.

Literature Cited:

Zorn, T.G., P.W. Seelbach, and M.J. Wiley. 1998. Patterns in the distributions of stream fishes in Michigan's Lower Peninsula. Michigan Department of Natural Resources, Fisheries Division, Research Report 2035, Ann Arbor.

Zorn, T.G., P.W. Seelbach, and M.J. Wiley. 2002. Distributions of stream fishes and their relationship to stream size and hydrology in Michigan's Lower Peninsula. Transactions of the American Fisheries Society 131:70-85.

Zorn, T.G. 2002. Fish assemblages of lower Michigan rivers: distribution patterns, abundance models, and causal relationships. Ph. D. Dissertation. The University of Michigan, Ann Arbor.

Prepared by: Troy G. Zorn

Date: September 30, 2002

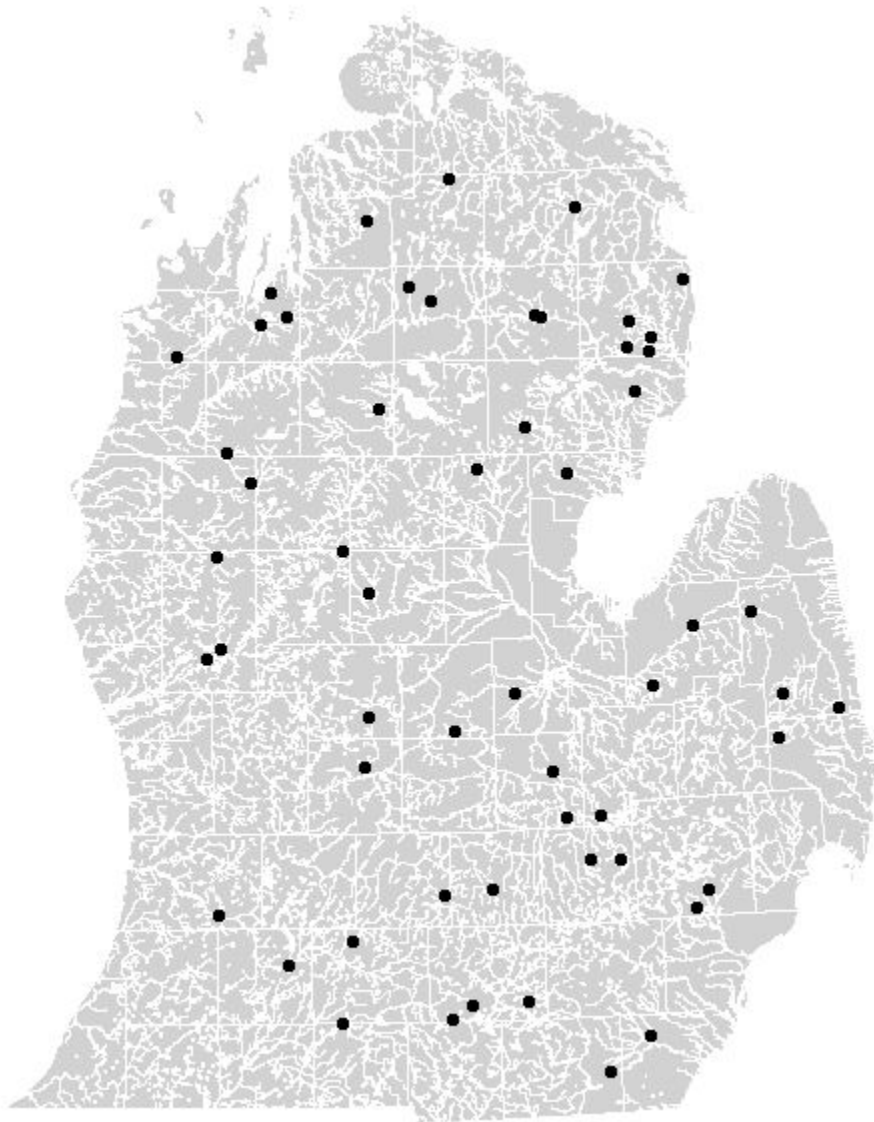


Figure 1.—Locations of Michigan Rivers Inventory sites where electronic thermometers were deployed to obtain hourly water temperature readings during July 2002.