STUDY PERFORMANCE REPORT

State: Michigan

Study No.: 679

Project No.: F-35-R-24

Title: Ecological river classification as a basis for management of coldwater streams

Period Covered: April 1, 1998 to September 30, 1999

Study Objectives: 1) To complete the classification of Lower Peninsula rivers by including the remaining, smaller coastal rivers (most Lower Peninsula rivers were classified by Seelbach et al. 1997). 2) To review the classifications boundaries and codings of all Lower Peninsula stream segments, in light of available data and experiences of field personnel. This revision will add major in-channel lakes, coding of individual tributary streams, current trout stocking prescriptions, and current stream classifications. 3) To develop criteria for classification of coldwater streams, and to then classify all stream segments as appropriate. Segment classifications will be compared with previous Fisheries Division Stream Classifications and changes recommended, if needed. Finally, a process for revision of classifications will be developed. 4)To develop stream criteria for trout stocking, and to then classify all stream segments as to their suitability for stocking to meet specific management objectives.

Summary: All remaining Lower Peninsula coastal river systems were classified as ecological valley segment units and added to the master data table. Major in-channel lakes and reservoirs, and individual tributary streams were added to the database. The U.S. EPA's "Reach File 3" digital streams map was chosen as the base map for classifications. Five MDNR stream management classifications were coded to the RF3 map.

Job 1. Title: Classify remaining streams.

Findings: All remaining Lower Peninsula coastal river systems were broken into ecological valley segment units, and attributes estimated by interpreting overlaying map themes using a GIS (methods according to Seelbach et al. 1997). These data completed the master data table for Lower Peninsula rivers. The smallest streams, shorter than 2 inches in Anonymous (1997), were not included.

Job 2. Title: Review and update classifications.

Findings: I decided to put off review of classification boundaries and codings until after all structural revisions to the classification database were completed; thus this review was not done.

Major in-channel lakes and reservoirs were added to the database as segments. Tributary streams that were grouped within "stream families" in Seelbach et al. (1997) were broken into individual records in the database, allowing for individual treatment within the classification system.

I chose the U.S. EPA's "Reach File 3" (RF3; at 1:100,000) digital streams map as the base map for the classifications. The RF3 is a GIS database composed of many small, uniquely-numbered stream "reaches". Attribute data can be linked to a given reach. Materials such as water or fish can be "routed" up or down a stream network in a modeling environment, according to the numbering system. Many state and federal agencies use the RF3 base map, so it would make our classification system widely compatible. The RF3 is packaged according to federal hydrologic cataloging units, which were generally the larger river systems. The Lower Peninsula contains about 35 units (Figure 1).

Ecological valley segments delimited by Seelbach et al. (1997) were transferred to the RF3 reach system (several reaches were included in each larger segment; this was accomplished by coding several reach records in the database with the same segment id number).

In addtion, 4 MDNR classifications were coded to the RF3 map: 1) the historic (1967) trout stream classification; 2) the current trout stream designation (see Figure 2 for example); 3) the current trout stocking locations; and 4) the current trout fishing regulation locations. These 4 maps and the Ecological Valley Segment map can all be overlain for comparative analyses.

Job 7. Title: <u>Write reports.</u>

Findings: This annual progress report was prepared as scheduled.

Literature cited:

Anonymous. 1997. Michigan Atlas and Gazetteer. DeLorme Mapping Co., Freeport, ME.

Seelbach, P.W., M.J. Wiley, J.C. Kotanchik, and M.E. Baker. 1997. A landscape-based, ecological classification for river valley segments in lower Michigan. Michigan Department of Natural Resources, Fisheries Research Report 2036, Ann Arbor.

Prepared by: <u>Paul W. Seelbach</u>
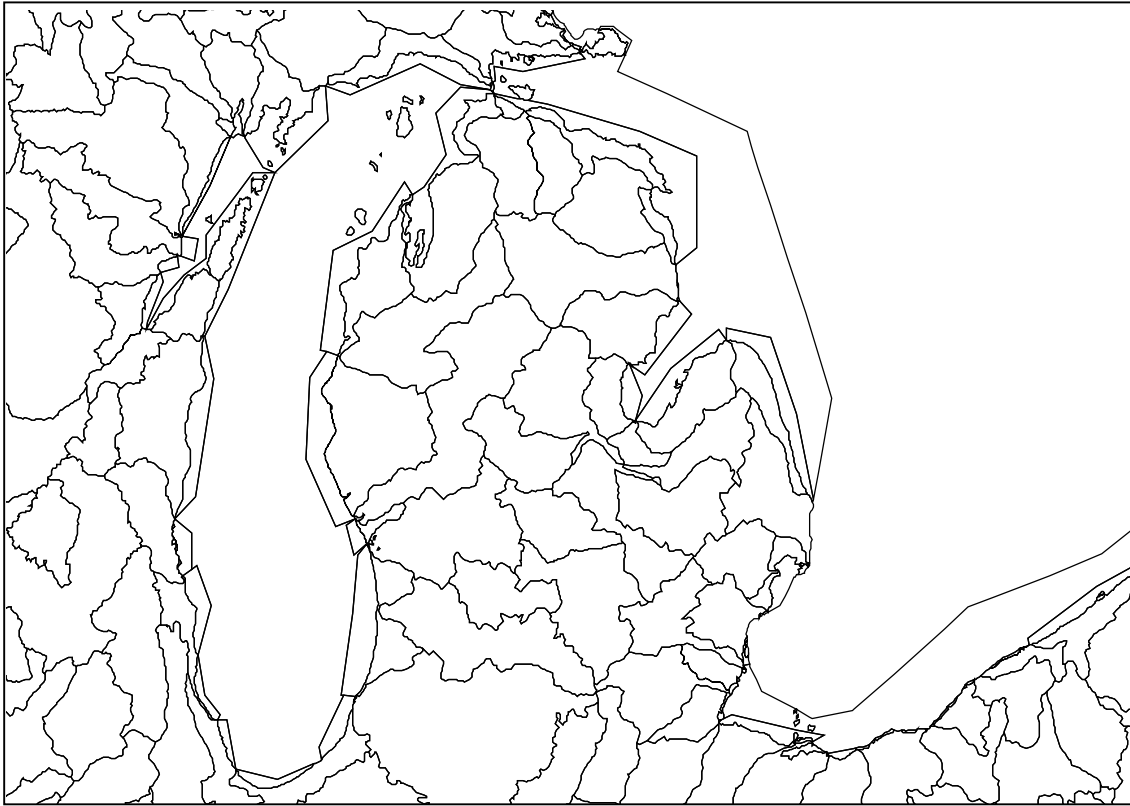**Dated:** <u>September 30, 1999</u>

Figure 1.–Map showing EPA's hydrologic cataloging unit boundaries for Michigan's Lower Peninsula.
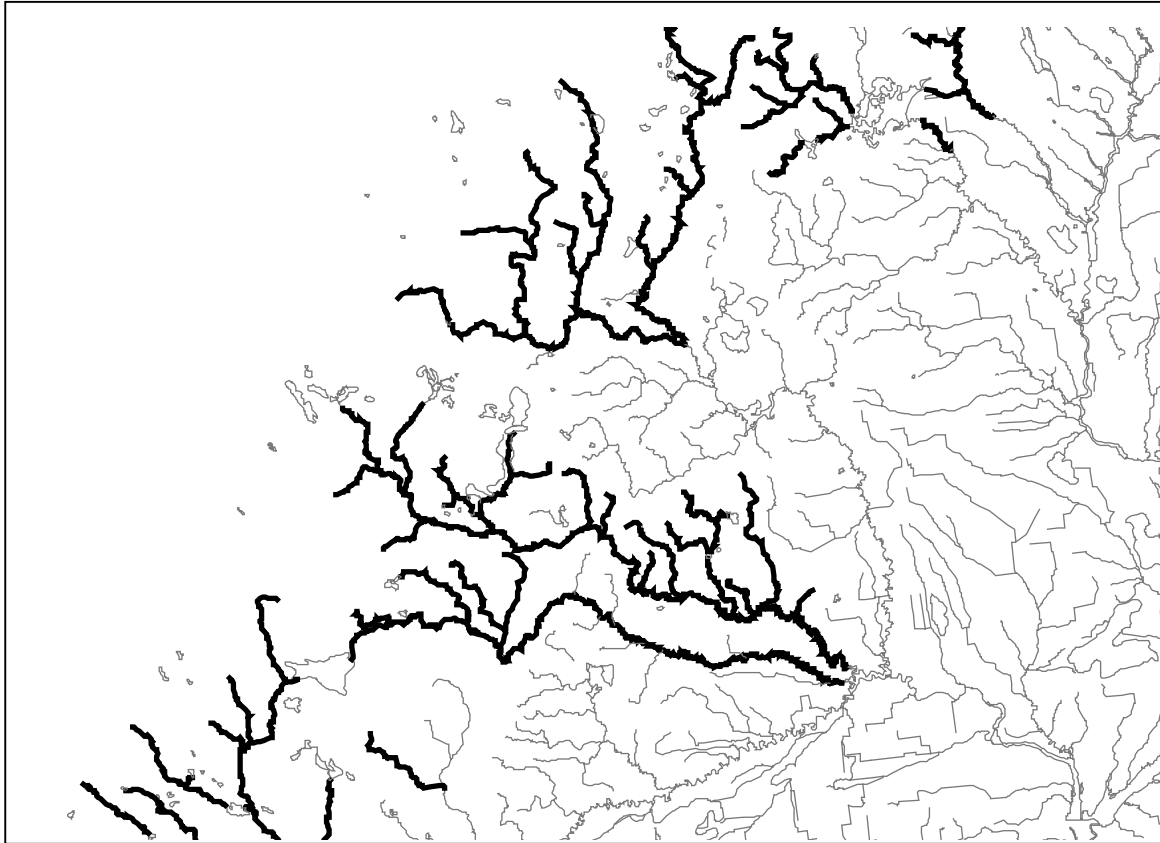
Figure 2.–Example of the trout stream designation mapped onto the RF3 streams basemap for the upper Tittabawassee River. Designated trout streams are shown as heavy black lines.