STUDY PERFORMANCE REPORT

State: Michigan **Project No.:** F-81-R-2

Study No.: 674 **Title:** Compilation of databases on Michigan lakes

Period Covered: October 1, 2000 to September 30, 2001

Study Objective: To facilitate electronic access to previously collected data on Michigan lakes. In cooperation with Fisheries Division's Information Management Unit, expand the design of the Division's current data management system to enable access to multiple data sets on lakes. Prepare a master list of lake names and locations so that each lake can be uniquely identified and linked to appropriate databases, beginning with lakes at least 100 acres in area and having public access. Compile databases on Michigan lakes in electronic format in a manner that will make them accessible from relational databases and geographic information systems. Begin digitizing maps of lake depth contours.

Summary: Under Job 3, a unique identification key, based on the county and lake number assigned by Humphrys and Green (1962), has now been assigned to 7,391 lake polygons in ArcView. This includes all lakes ≥17 acres in area in our updated version of the MIRIS lake-polygon layer. Additional data sets on Michigan lakes were assembled and converted to electronic format. Under Job 4, 33 lake maps have now been digitized, including depth contours and information on bottom type and vegetation. Using the digitized contours, lake volume and mean depth were computed for 17 lakes. Under Job 5, a progress report has been written and a final report has been drafted and submitted to the Fisheries Division's Editing and Finishing Process for Publication of Research and Technical Reports. Under Job 7, information from several sources was prepared and used to develop models to predict walleye population characteristics. Initial work focused on approximately 700 lakes that are at least 50 acres in area and have public access sites.

Job 3. Title: Assemble databases: format data; prepare metadata descriptions.

Findings: Work continued on assembling databases, formatting data, and assigning unique identification keys, which are based on the county and lake number assigned by Humphrys and Green (1962). Working in ArcView on an updated version of the MIRIS lake-polygon layer, unique identification keys have now been assigned to 7,391 lake polygons. This includes all lakes ≥17 acres in area in this updated theme originally obtained from the Spatial Data Library of the Department of Natural Resources (DNR). Additional metadata descriptions of the databases were prepared.

Job 4. Title: Begin to digitize lake maps. Calculate lake volume and mean depth.

Findings: Digitizing lake depth contours was done for an additional 16 lakes, bringing the total to 33 lakes. This includes 18 of the 20 largest lakes in Michigan (Laarman 1976). For most of

these lakes, the original map contains information on bottom types and aquatic vegetation (Taube et al. 1964). This information was captured and stored in separate data layers with the digital map. Using the digitized contours, lake volume and mean depth were computed for 17 lakes.

Job 5. Title: Write/prepare final report.

Findings: A progress report has been written. A final report has also been drafted as the following manuscript, which has been submitted to the Fisheries Division's Editing and Finishing Process for Publication of Research and Technical Reports:

Breck, J. E. 2002. Compilation of databases on Michigan lakes. Michigan Department of Natural Resources, Draft Fisheries Technical Report, Ann Arbor.

This manuscript will be published as a Fisheries Technical Report during 2001-02, and submitted as a final report December 2002.

Job 7. Title: Develop models to predict walleye population characteristics.

Findings: Information from several sources was assembled to develop models to predict walleye population characteristics. Initial work focused on approximately 700 lakes that are at least 50 acres in area and have public access sites. Information on walleye captured in netting surveys was obtained from Fisheries Division's Fish Collection System and from a compilation by Laarman (1963). Additional information about lake and watershed characteristics was compiled or was already available under Job 3.

Literature Cited:

Humphrys, C.R., and R.F. Green. 1962. Michigan lake inventory bulletins 1-83. Michigan State University, Department of Resource Development, East Lansing.

Laarman, P.W. 1963. Average growth rates of fishes in Michigan. Michigan Department of Conservation, Report 1675, Ann Arbor.

Laarman, P.W. 1976. The sport fisheries of the twenty largest inland lakes in Michigan. Michigan Department of Natural Resources, Fisheries Research Report 1843, Ann Arbor.

Taube, C.M., P.M. Earl, E.E. Schultz, T.M. Stauffer, and W.C. Wagner. 1964. Lake mapping and lake and stream inventory in Michigan. Michigan Department of Conservation, Report 1692, Ann Arbor.

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