Analysis and Synthesis of Fish Populations, Community Structure, Zooplankton, and Limnological Data Collected through Michigan's Statewide Inland Lakes Status and Trends Protocol (ILSTP) Surveys

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Background

This project supports the analysis and summary of data collected through the Inland Lake Status and Trends Program (ILSTP). The ILSTP began in 2002 and relies on Fisheries Division field staff to survey a randomly selected set of lakes every year. Status and Trends surveys are intended to provide a statewide picture of the condition of fish communities and habitats across the state and how these conditions change over time. The ILSTP uses a statistically based sampling design to determine what lakes to survey and ensures proper sampling is done across the state and across a range of lake types. All public lakes 10 acres and larger are included in this effort and private lakes are generally not sampled by Fisheries Division. Private lakes are defined in this study as those waters without inflows or outflows where access to a particular lake is restricted to the landowners living around the lake. If a lake has no public launch ramp but is accessible from a pay ramp or from a connecting water body that does have a public launch ramp, then that lake is included in this study.

Status and Trends surveys consist of a fish component and a water chemistry/habitat (limnological) component. Fish surveys are conducted between the end of April and mid-June in the Lower Peninsula and between the end of May and mid-July in the Upper Peninsula. Multiple gears (trap nets, fyke nets, gill nets, seines, and electrofishing) are used in an effort to collect information from a range of species and size classes. Because the primary goal of Status and Trends fish surveys is to collect an unbiased, representative sample of the entire fish community, nets are set at randomly selected locations to ensure that all conditions are sampled in each lake.

Limnological surveys are conducted in August and September when lakes are at their peak temperature and dissolved oxygen stratification. At the deepest basin in each lake, water transparency, temperature, and dissolved oxygen are measured. Water samples are also collected to determine, concentrations of alkalinity, nutrients, and chlorophyll a, and to determine the species and sizes of zooplankton. The littoral zone and lakeshore are also visually assessed to determine intensity of residential development and shoreline modifications as well as the quantity of fish habitat in the form of large wood.

Science-based management of aquatic resources requires high-quality information that is readily available to managers and stakeholders. Collecting and distributing this information is an essential role of Fisheries Division and is required to fulfill our public trust mission. The Status and Trends program provides the comprehensive information needed to understand and effectively manage Michigan's inland lakes.

Study objectives

1. Develop reference points for the management of sport fish populations and lake habitat.
2. Assess status of sport fish populations, fish community structure, zooplankton, and limnological parameters and track changes in these resources.

3. Determine factors influencing status and trends of sport fish populations, fish community structure, zooplankton, and limnological parameters in lakes.
4. Oversee continued implementation, coordination, and maintenance of the ILSTP and provide scientific and technical support to the field staff.

Key results

Since 2002, Fisheries Division has surveyed 470 lakes. A report was written summarizing the first six years of the program and is available at http://www.michigan.gov/dnr/0,4570,7-153-10364_52259_19056-332637--,00.html. This report represents the first statewide assessment of inland lake resources and is intended for use by scientists, managers, policy makers, and the public. It provides an up-to-date summary of information on lakes and characterizes the patterns in lake habitat, fish community structure, and fish population characteristics. The findings presented in this report document the status of selected lake resources and establish the baseline conditions against which future monitoring results can be compared.

Data from the ILSTP are routinely used to make fisheries management decisions on individual lakes. Status and Trends data have also been used to meet statewide management needs such as the development of a lake classification system based on fish species composition, an assessment of the effects of residential development on lakeshore and nearshore habitat conditions, the development of an index of human stress on inland lakes, an assessment of the effects of catch and release bass regulations, and development of Michigan's Wildlife Action Plan. Status and Trends data are also currently being used to assess the effects of climate change on lake fish and their habitat.