

## Executive Summary

This is one of a series of river assessments being prepared by the Fisheries Division of the Michigan Department of Natural Resources (MDNR), for Michigan rivers. This document describes the characteristics of the river and its biological communities. It also describes the unique resources in the Huron River watershed (southeast Michigan).

This assessment's purposes are first, to have an organized approach to identifying opportunities and solving problems of aquatic resources and fisheries values within the watershed. Second, to provide a way for public involvement in fishery management decisions. And third, to provide an organized reference for Fisheries Division personnel, other agencies, and citizens who need information about a particular fishery resource.

This document consists of four parts: an introduction, a river assessment, management options, and public comments and responses. The river assessment is the nucleus of the manuscript. In twelve sections (geography, history, biological communities, geology and hydrology, channel morphology, soils and landuse patterns, special jurisdictions, recreational use, dams and barriers, water quality, fishery management, and citizen involvement) we describe the characteristics of the Huron River and its watershed.

In the management options we identify a variety of management problems and opportunities. Three types of options for responding to opportunities or problems are proposed. The first are opportunities to protect and preserve existing resources. The second require additional surveys. The third are chances to rehabilitate degraded resources. Opportunities to improve an area or resource, above and beyond the original condition, are listed last. The options listed are not necessarily recommended by Fisheries Division, but are intended to provide a foundation for public discussion and comment and the later selection of objectives for managing the Huron River and its fisheries.

The Huron River is located in southeastern Michigan and empties into the northwest corner of Lake Erie. Its watershed is within portions of seven counties: Oakland, Livingston, Ingham, Jackson, Washtenaw, Wayne, and Monroe. Twenty-four major tributaries flow into the mainstem.

For purposes of discussion, the river is divided into sections. The first is from Big Lake, Oakland County which is the true headwater of the system, to Commerce Lake, Oakland County. The second is from Commerce Lake through the chain-of-lakes to Baseline (Flook) Dam, Washtenaw County. The third area is from Baseline (Flook) Dam to Barton Impoundment, Washtenaw County. The fourth section is Barton Impoundment to French Landing Dam, Wayne County. The final section is from French Landing Dam to the river mouth at Lake Erie.

More than 90 species of fish are native to the Huron River drainage and the original potamodromous species can be inferred from historical records of neighboring river systems. European settlement of the watershed began in the mid 1700s and this signaled the beginning of many deliberate and inadvertent changes to the river's fish communities. Now the Huron River contains at least 99 fish species. Many native species are still present and abundant; a number have declined severely and are rare; five are considered threatened (silver shiner, redbelly dace, southern redbelly dace, eastern sand darter, and sauger) and northern madtoms are considered endangered. Two species have been extirpated, channel darter and river darter.

The diversity of fish species is relatively high. The communities appear healthy with a good mix of species requiring various habitats. Fish communities typical of vegetated lake outlet, gravel, and higher gradient habitat have been reduced through loss of such habitats. Other aquatic organisms, the invertebrates, mussels, amphibians, and reptiles have followed similar patterns. Mammals, birds, and plants have also been affected.

Rivers exist only as patterns of water flow. The geology and hydrology of the watershed are the keys to understanding how the systems works. They determine the patterns of water flow over the landscape, reflecting watershed conditions and influenced by climate. Flow stability is a determining factor in ecological and evolutionary processes. Flows are looked at annually, seasonally, and on a daily basis. The most stable streams in Michigan, the AuSable, Manistee, and Jordan rivers rarely flood nor have low flows that are less than 80% of average. The Huron River is fairly stable, but it is easy to pick out trouble spots caused by land use patterns, channelization, and dams. These fluctuations destabilize banks, create abnormally large moving sediment bedloads, disrupt and destroy habitat, strand and kill organisms, and interfere with recreational uses of the river.

The shape of the river channel itself is very dynamic as the unending flow of water is constantly affecting changes. River gradient is the key. Gradient is measured as elevation change in feet per river mile. The average gradient of the mainstem is 2.95 ft/mi. However areas of differing gradient are what is naturally found. These gradients create diverse types of channels and therefore different kinds of habitat for fish and other aquatic life. The best river habitat offers such variety to support different life functions of species. Fish and other aquatic life are typically most diverse and productive in river sections with gradient between 10 and 69.9 ft/mi. Unfortunately, such gradients are rare in Michigan because of the low-relief landscape. Areas of high gradient are also most likely to have been dammed or channelized. The Huron River mainstem contains only 6 mi of 136 mi total (4%) of this desirable area. However, 54 mi (40%) of the river are impounded by dams. The amount channelized is substantial.

In combination with climate, soils and landscape use help decide much of the hydrology and channel form in the river. Changes in land use are often the force that drives change in river habitats. The Huron River watershed is now dominated by agriculture with large urban areas interspersed. Both types of landscape use have dramatic affects on aquatic environments through increased erosion, drainage of wetlands, channelization of streams, destabilization of water flow, and increases in impervious land area that increase surface input, decrease ground water and therefore increase temperature.

The river system is highly fragmented by dams, 96 to date; 19 are on the mainstem and 77 on tributaries. These structures influence flow patterns and channel cross-sections. They block drift and migrations by aquatic organisms, change river temperatures, increase evaporation and reduce streamflow, disrupt downstream transportation of sediment and wood debris, and modify water quality. Dams have degraded fish communities through the inundation of scarce, high gradient reaches and through their cumulative affects on water temperature and flow patterns. They have prevented fish from migrating among critical seasonal (summer, winter, or spawning) habitats within the river.

Water quality and variables that affect aquatic life and uses of the river, such as temperature and a variety of chemical constituents, is generally good. Certain portions suffer degradation through point and non-point source inputs.

The Huron River has tremendous recreational potential being near the population centers of Ann Arbor, Ypsilanti, and the Detroit metropolitan area. A great many people take advantage of the river's opportunities for fishing, canoeing, rowing, motor-boating, wind surfing, sailing, swimming, picnicking, hunting, trapping, nature study, and bird watching. Access to the river is excellent, provided by a series of state and Huron-Clinton (HCMA) lands. The lakes, impoundments, and larger tributary streams provide more limited opportunities as access is not as readily available.

The watershed is now on the edge of the "urban sprawl" of the Detroit metropolitan area. It is projected by the Southeast Michigan Council of Governments that between 1990 and 2010 the population of southeastern Michigan will increase by 6% and the land area in urban use will expand by 40%. Nearly all of this expansion is expected to be in the Huron River watershed, with concentrations in the Portage, Davis, and Mill creeksheds, and near the river between Hamburg and Ann Arbor.

The management options offer a variety of ways for communities to look at the opportunities and problems that are before them now and that will be in the future. Integrated land use planning *throughout the watershed* is crucial if this region is going to maintain the features that made the Huron River watershed such a desirable place to settle and live.