EXECUTIVE SUMMARY

This is one of a series of river assessments being prepared by the Michigan Department of Natural Resources, Fisheries Division for Michigan rivers. This report describes the physical and biological characteristics of the Cheboygan River, discusses how human activities have influenced the river, and serves as an information base for future management of the river.

River assessments are intended to provide a comprehensive reference for citizens and agency personnel who need information about a river. By pulling together and synthesizing existing information, river assessments show the intertwined relations between the river, watershed landscapes, biological communities, and humans. These assessments will provide an approach to identifying opportunities and solving problems related to aquatic resources in the Cheboygan River watershed. We hope it will encourage citizens to become more actively involved in decision-making processes that provide sustainable benefits to the river and its users. Assessments also identify the types of information needed to better understand, manage, and protect the river.

This document consists of four parts: an introduction, a river assessment, management options, and public comments (with our responses). The river assessment is the nucleus of each report. It provides a description of the Cheboygan River and its watershed in thirteen sections: geography, history, geology, hydrology, soils and land use, channel morphology, dams and barriers, water quality, special jurisdictions, biological communities, fisheries management, recreational use, and citizen involvement.

The Management Options section of the report identifies a variety of actions that could be taken to protect, restore, rehabilitate, or better understand the Cheboygan River and its watershed. These management options are categorized and follow the main sections of the river assessment. They are intended to provide a foundation for public discussion, setting priorities, and planning future management activities for the watershed.

The Cheboygan River drains 1,493 square miles of the northern Lower Peninsula. Its basin comprises portions of six counties: Emmet, Cheboygan, Presque Isle, Charlevoix, Otsego, and Montmorency. The Cheboygan River is only a very small portion of the river system. For purposes of this assessment, the watershed is divided into eighteen segments, each reflecting the characteristics of the river and its tributaries as they flow across different landforms, receive tributaries, and pass through impoundments. There is a variety of stream types present from coldwater to warmwater. A multitude of lakes can be found within the watershed, including three of the largest inland lakes in Michigan. The diversity of water types leads to the incredible aquatic biodiversity of the watershed.

Much of the Cheboygan River watershed was formed during the last glaciation. Ice sheets scoured the land and deposited material in the form of moraines and other glacial features. This glacial activity determined, to a large extent, the character of our streams today. The river system, or Inland Waterway, was used by Native Americans and early settlers as a transportation and trading corridor. Later, the waterways were used to transport trees cut from the watershed during the logging era of the late 1800s and early 1900s. Instream substrate and fish cover are still recovering from those logging days. Tourism, hunting, and fishing have long been an important part of the economy in the watershed.

The geology of the Cheboygan River watershed results in high groundwater inputs to many of the tributaries, particularly in the upper (headwater) reaches. The more permeable surficial (glacial) geology types, combined with elevation changes, produce the most groundwater input. These areas typically have stable flows and colder summer water temperatures.
Groundwater inflows are directly linked to the characteristics of biotic communities in rivers because of their effects on physical habitat features including temperature, flow stability, and channel morphology. Although the groundwater loading to the Cheboygan River watershed is the highest of any watershed in Michigan, actual groundwater inflows into particular segments vary considerably due to variation in soil type (permeability) and topographical relief. Small, coldwater streams and medium coldwater rivers (such as the Sturgeon and Pigeon rivers) have higher groundwater inflow due to the presence of permeable soils and large changes in topography. The soil types and moderate to flat topography of the landscape in segments such as the East Branch Maple, Lower Black, and Cheboygan rivers lead to lower groundwater inflows in these reaches. Groundwater inflow is even less in the areas of the watershed with the lowest topographical relief, such as the Rainy River. Annual flow regimes are also variable among segments due to soil types and the surrounding landscape; daily flow regimes generally are stable, but extreme fluctuations in stream flow occur on the Pigeon River due to operation of the Golden Lotus Dam.

Soil type and slope determine potential land use, infiltration rates, water-holding capacity, and erodibility, and are therefore directly related to the amount of non-point-source pollution (such as sedimentation) in the watershed. Soils in the Cheboygan River watershed range from well-drained, sandy soils to poorly-drained organic soils. Although most of the watershed is forested with wetlands scattered throughout, anthropogenic activities such as residential and commercial growth, high levels of oil and gas development, and the accompanying road construction and maintenance contribute to increased rates of erosion and sedimentation, which can negatively affect aquatic communities.

Gradient (the general slope, or change in vertical elevation, of a river’s channel) is directly related to a stream’s habitat features, and accordingly, the biological community that is present. Many of the major tributaries in the Cheboygan River watershed are steep and contain some of the highest gradient in the Lower Peninsula. Such reaches generally receive higher groundwater inflow, have good to excellent hydraulic diversity, are colder, and are more likely to support coldwater fish community assemblages than the low to moderate gradient areas located within the downstream reaches of the basin.

Channel cross sections can be used to monitor the quality of fish habitat since the width of a stream channel can be influenced and modified by a number of factors. Deviations from the expected widths can indicate alterations such as direct disturbance (dredging or channelization) or changes within the watershed due to deforestation, poor agricultural land practices, and construction of road-stream crossings. Three-quarters of the measured channel widths in the watershed were within the expected range, while the remaining quarter were narrower than the expected range of values. This is not surprising given the abundance of coldwater streams in the watershed and their stable flow nature.

There are 48 dams in the Cheboygan River watershed. Dams effectively act as a barrier, disrupting natural flows, and preventing fish passage and movement of other biota. Structures other than dams can act as barriers as well, including undersized or poorly placed culverts at road-stream crossings. Some barriers are intentionally placed in rivers to preclude undesirable fish species from a reach of river; sea lamprey barriers, for instance, have become important in the control of this invasive species. Dams can also affect water temperatures, stream substrate, channel morphology, and nutrient transport.

A major consequence of these barriers is making a large amount of habitat unavailable to migratory fish species, such as steelhead, Chinook salmon, lake sturgeon, and brown trout. Production of many of these species could be greatly enhanced if they were able to access habitat upstream of dams.

Overall water quality in the Cheboygan River watershed is good. Water quality is evaluated by the Michigan Department of Environmental Quality (MDEQ) through rapid biological surveys.
throughout the watershed, and application of standardized water quality metrics to the survey data. Water chemistry data and fish contaminant monitoring are also important measures of water quality. The Cheboygan River watershed has relatively few point source pollutant sources. Non-point-source pollution, particularly sediment, is a threat to the watershed. Sedimentation can cover substrate suitable for fish spawning and nursery habitat, change channel shape, decrease habitat heterogeneity, and decrease invertebrate diversity and density. Airborne pollutants also are deposited in the watershed, and contribute to fish consumption advisories.

Federal, state, and local units of government are all involved, in varying capacities, with the administration of environmental regulations and the management of natural resources in the watershed. The Federal government regulates three hydroelectric facilities located on the Black River, and one facility on the Cheboygan River. Local governments are involved with planning and zoning. The state has the most environmental regulatory responsibility in the watershed—administering a wide range of regulations that includes water quality standards, Natural River zoning, and wetlands protection. In addition, thirty-six percent of the land in the watershed is under the state’s ownership and is managed by the Michigan Department of Natural Resources (MDNR). In the physical sense, navigability in the watershed is partially influenced by the work of Federal and state agencies involved with waterway management. However, the legal navigability of a particular water body is largely determined by Michigan courts.

Currently, 78 fish species are known to inhabit the Cheboygan River watershed. Coldwater fish communities, typically with brook/brown trout and sculpin, are found primarily in the headwater reaches of this watershed. The remainder of the riverine portion contains a mix of coolwater and some warmwater species whose distribution is a function of the amount of water warming. Some subwatersheds such as the Maple, Sturgeon, and Pigeon have relatively cooler waters in the downstream reaches while other watersheds (Black, Rainy) are warmer in the downstream reaches. The lower reaches of the Black River and Black Lake are home to a threatened fish species, the lake sturgeon. This species can also be found in Burt and Mullett lakes.

The biological communities of the Cheboygan River watershed are affected by numerous dams. These dams serve as significant barriers to migrating fish, and fragment the biotic communities of the inland watersheds. These structures, as well as poorly designed culverts and beaver dams, can restrict the movement of important native fishes such as walleye, lake sturgeon, and brook trout and have prevented the passage of important naturalized species such as salmon, steelhead, and brown trout. It is likely that the removal of certain dams in the watershed would drastically change the dynamics of certain fish populations in this region. Such management practices would reduce the reliance on high-cost stocking programs to maintain popular trout and salmon fisheries.

Aquatic invertebrates in the watershed have been sampled by Michigan Department of Environmental Quality (MDEQ) during water quality surveys. These surveys show a diverse and abundant macroinvertebrate community in most locations sampled. Diversity and abundance scores were lower where habitat has been degraded. A variety of amphibians, reptiles, birds, and mammals inhabit the Cheboygan River watershed. Habitat loss threatens some of the rare species that have specific habitat requirements. Aquatic nuisance species such as round goby, zebra mussels, and Eurasian milfoil have also colonized parts of the watershed and compete with native species.

The Cheboygan River watershed contains a diverse array of warm, cool, and coldwater rivers, and a multitude of lake types. Due to this diversity and wealth of fishery resources, a substantial amount of fisheries management activities have occurred within the watershed. Past management activities have included fish stocking, habitat improvements, fishing regulations, chemical reclamations, and numerous fish surveys. A multitude of fish species have been stocked at various times and locations throughout the watershed. The watershed supports several blue ribbon trout streams for brook, brown,