
Chapter Two: Water Quality

Introduction

The Cheboygan River/Lower Black River Watershed contains over 5000 acres of surface water in its lakes, in addition to hundreds of miles of rivers, streams and tributaries. The quality of these important waterbodies becomes increasingly at risk as development of natural areas continues and forested lands are converted to commercial and residential parcels. As these and other land use changes continue to take place, the associated pollution impacts to lakes, streams and rivers increase. During periods of high runoff (rainstorms, snowmelts, etc.) contaminants such as fertilizers, sediments, nutrients, oil, grease, road salt and toxic chemicals are flushed from streets, parking lots, yards and agricultural lands. The pollutant laden water can either move overland to the nearest lake, stream or wetland or percolate through the soil into the groundwater. Storm sewers and drains, which increase with development, provide an even more direct route for runoff to reach the water resources. At present, the Cheboygan River/Lower Black River Watershed has a *Good to Excellent* water quality rating, but with the ever-increasing demands development puts on our water resources, great care will need to be taken to ensure continued high water quality.

Designated Uses of the Cheboygan River and Lower Black River

Part 31 (formerly known as the Water Resources Commission Act) of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended requires all waters of the State of Michigan to be of the quality to meet seven designated uses:

- 1.) Agriculture
- 2.) Industrial water supply
- 3.) Public water supply at the point of intake
- 4.) Navigation
- 5.) Warm or cold water fisheries
- 6.) Other indigenous aquatic life and wildlife
- 7.) Partial or total body contact recreation

At the present time, none of the designated uses for the Cheboygan River/Lower Black River Watershed are impaired. As the population within the watershed continues to grow, however, the impact of human activities on the quality of water will become increasingly noticeable. Residential and commercial development, along with increased recreational activities will stress watershed critical areas, threatening some designated uses and degrading their status to "impaired".

Table 4 Lists the status of the seven Designated Uses and shows the causes and sources of threats to those uses.

Table 4: STATUS OF DESIGNATED USES			
Designated Use	Impaired?	Threatened?	Cause or Source of Threat
Agriculture	No	No	
Industrial	No	No	
Public Water Supply	No	Yes	Failing septic systems; Livestock access to streams; Groundwater contamination
Navigation	No	Yes	Sedimentation
Warm or Cold Water Fisheries	No	Yes	Impact of dam; Sedimentation from construction/development sites; Nutrients from lawn care/ agriculture practices
Indigenous Aquatic Life/ Wildlife	No	Yes	Development/ construction along shorelines; Invasive species; Nutrients from lawn care/ agriculture practices
Partial/Total Body Contact	No	Yes	Failing septic systems

Desired Uses

Desired uses are those uses not required by law, but which the community has deemed important to the watershed. A list of desired uses for the Cheboygan River/Lower Black River Watershed was developed by the steering committee at the initial steering committee meeting, with input from the technical committee and concerned community members. The Desired Uses for the watershed are listed below:

- Protection of critical areas
- Preservation of open space
- Zoning for conversion of lawns, shorelines to greenbelts
- Enactment of stormwater controls
- Management of water for irrigation (no water usage regulations at present)
- Floodplain protection
- Gauges for Cheboygan dam

Initial Water Quality Summary

Both the Cheboygan River and the Lower Black River have good to excellent water quality and meet the requirements for all seven designated uses. These river systems are actively used for agriculture; navigation; industrial water supply; warm-water fishing; total body contact recreation; and provide habitat for indigenous aquatic life.

Known and Suspected Pollutants

Evidence of several pollutants has been noted in various parts of the watershed. Some of these pollutants, along with their known or suspected causes are:

- ♦ *Nutrients*—agricultural runoff, livestock access to streams, waterfowl, lawn maintenance practices, inadequate or failing septic systems, manure
- ♦ *Toxics*—Contaminated sites
- ♦ *Petroleum products, chlorides, vehicular contaminants, bacteria, pesticides*—abandoned wells, underground storage tanks, boats, housing, dams, undersized culverts
- ♦ *Sediments*—road/stream crossings, streambank erosion, development activities, stormwater runoff, recreational uses, inadequate or poorly maintained culverts
- ♦ *Biological (invasive species)*—recreation boats

Below, **Table 5** shows known (k) or suspected (s) pollutants in the watershed area, along with the known or suspected source and/or cause of each pollutant.

Table 5: Pollutants, Causes and Sources		
KNOWN OR SUSPECTED POLLUTANTS	SOURCE OF POLLUTANT	CAUSE
Sediments (k)	Streambanks (k)	Livestock access (k) Human access (k) Flow Fluctuations (s)
	Road-stream crossings (s)	Undersized or deteriorating culverts (s)
	Agricultural activities (k)	Uncontrolled livestock access (k)
	Development sites (s)	Inadequate erosion control (s) Loss of greenbelt (k) Construction activities (s)
	Stormwater runoff (k)	Impervious surfaces (k) Inadequate drains (k)
Nutrients (s)	Inadequate wastewater treatment (s)	Improperly sited, designed, or maintained septic systems (s) Combined sewer overflows (s)
	Leaves/grass clippings (s)	Residential lawns (s)
	Fertilizers (k)	Residential lawns (s) Agricultural operations (s)
	Animal manure (k)	Uncontrolled livestock access (k) Waterfowl (k)
Oils, grease and metals (s)	Stormwater runoff (k)	Improper oil disposal (s) Impervious surfaces such as parking lots (s)
Pesticides	Residential lawns (s)	Improper use/overuse (s)
	Agricultural operations (s)	Improper use/overuse (s)
Toxics	Contamination sites	Leaking underground storage tanks Improper disposal of hazardous household wastes Abandoned wells

Water Quality Threats or Impairments

Many factors can contribute to the degradation of water quality. A list of factors that are impacting water quality and future uses for the watershed was developed by the steering committee for the Cheboygan River/Lower Black River Watershed. Steering committee members expressed concern over several potential threats to the stability and health of the watershed. Threats cited include: conflict between recreational and industrial water uses; sediments and contaminants introduced to lakes and streams by stormwater runoff; increased development of lake and river shorelines; loss of wetlands and wildlife habitat due to development and other human impacts; inadequate or poorly maintained septic systems and agricultural runoff that contribute bacteria and nutrients to the water system; increased sedimentation from shoreline erosion and erosion at road/stream crossings; and impairment of recreation and aquatic/wildlife habitat with the introduction and spread of invasive species. **Table 6** is a compilation of the water quality concerns expressed by the steering committee, and the relationship of each concern to the affected designated use.

Table 6: Threats to Water Quality	
Water Quality Threats	Threatened Designated Use
Recreation/river use conflicts	Total/Partial body contact, Aquatic life/ wildlife, Cold/Warm water fisheries
Stormwater runoff	Cold/Warm water fisheries, Public water supply, Aquatic life/wildlife
Shoreline development	Public water supply, Aquatic life/wildlife, Navigation
Loss of wetlands	Aquatic life/wildlife, Public water supply
Loss of habitat	Aquatic life/wildlife, Cold/Warm water fisheries
Erosion	Navigation, Cold/Warm water fisheries, Aquatic life/wildlife
Septic/sewer system impacts	Public water supply, Cold/Warm water fisheries, Aquatic life/wildlife, Total/Partial body contact
Invasive species	Cold/Warm water fisheries, Aquatic life/wildlife, Total body contact

Initial Goals for the Cheboygan River/Lower Black River Watershed

Watershed goals outline the anticipated future state of the watershed. After reviewing the pollutants found to be threatening the watershed and discussing the watershed concerns expressed by the steering committee, a list of initial goals was drafted. The purpose of the list of goals is to guide the restoration and protection of the designated and desired uses for the watershed and is based on those uses found to be threatened or impaired. **Table 7** shows each threatened use, and the goal developed to alleviate or eliminate the threat.

Table 7: Initial Watershed Goals	
Public Water Supply	Prevent industrial, bacterial, chemical and organic pollution from entering the lakes and rivers of the watershed
	Prevent Increase in stormwater flows
	Provide for long-term protection of the watershed through the adoption and enforcement of local land use policies and conservation practices.
Navigation	Enhance recreational access sites to prevent degradation of water quality.
	Protect lake and river shorelines to control erosion
Warm or Cold Water Fisheries	Prevent increase in stormwater flows
	Improve and protect the water quality for the preservation of warm and cold water fisheries in the watershed by reducing the amount of sediment entering the system.
	Prevent industrial, bacterial, chemical and organic pollution from entering the lakes and rivers of the watershed
	Protect lake and river shorelines to control erosion
Habitat	Restore aquatic habitat in portions of the watershed where impairment is suspected
	Implement BMP's during all forest treatment activities in the critical area of the Watershed to protect water quality.
	Provide for long-term protection of the watershed through the adoption and enforcement of local land use policies and conservation practices.
	Ensure high water quality and provide for the protection of aquatic and terrestrial wildlife by reducing the amounts of nutrients, sediments and toxic pollutants entering the river.
	Prevent industrial, bacterial, chemical and organic pollution from entering the lakes and rivers of the watershed
Partial/Total Body Contact	Enhance recreational access sites to prevent degradation of water quality.
	Prevent industrial, bacterial, chemical and organic pollution from entering the lakes and rivers of the watershed