

Great Miami River (upper) Watershed TMDL Report

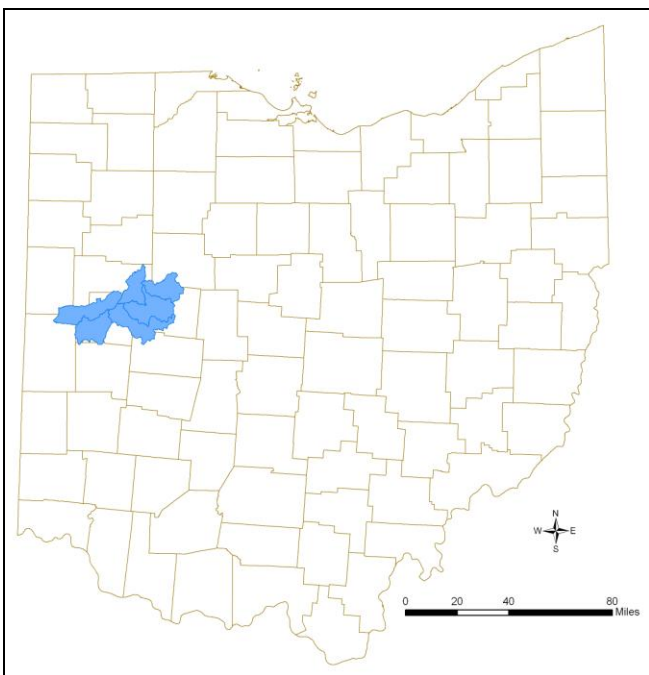
The Clean Water Act requires Ohio EPA to prepare a cleanup plan for watersheds that do not meet water quality goals. The cleanup plan, known as a total maximum daily load (TMDL) report, specifies how much pollution must be reduced from various sources and recommends specific actions to achieve these reductions.

What are the essential facts?

- Ohio EPA studied the Great Miami River (upper) watershed and found water quality problems at multiple locations.
- Water quality improvements can be made with practical, economical actions.
- Making water quality improvement depends on the participation of the watershed's residents.

Where is the Great Miami River (upper) watershed?

The Great Miami River (upper) watershed is located in western Ohio and drains 748 square miles. Much of the watershed is located in Logan and Shelby counties, with smaller portions in Mercer, Auglaize, Darke, Champaign, Hardin and Miami counties. The Great Miami River flows



in a generally southern direction and drains into the Ohio River just west of Cincinnati; the upper portion of the watershed covers approximately one-third of the drainage area of the Great Miami River basin and is home to two lakes used heavily for recreation (Indian Lake and Lake Loramie).

Overall, land use in the watershed is comprised of 71% cultivated crops, 8% pasture and hay, 9% forest and 9% developed land. Several major municipal facilities are located in the watershed, including the Indian Lake water pollution control district, the Minster wastewater treatment plant and the Bellefontaine wastewater treatment plant.

*A **watershed** is the land area that drains into a body of water.*

How does Ohio EPA measure water quality?

Ohio is one of the few states to measure the health of its streams by examining the number and types of fish and aquatic insects in the water. An abundance of fish and insects that tolerate pollution is an indicator of an unhealthy stream. A large number of insects and fish that are sensitive to pollution indicate a healthy stream.

In 2008, comprehensive biological, chemical, and physical data were collected in the watershed by Ohio EPA scientists. The watershed's conditions were compared with state water quality goals to determine which streams are impaired, and how much needs to be done to restore good stream habitat and water quality.

What is the condition of the Great Miami River (upper) watershed?

Sixty-four percent of the sites sampled in 2008 met aquatic life goals; 26 percent met some goals; and 10 percent did not meet goals. In contrast, only 28 percent of the sampled sites met recreation use goals; 72 percent did not meet recreation use goals.

The three most common causes of aquatic life use impairment include habitat alterations, nutrients and sedimentation. Probable sources include channelization, agricultural land uses and point sources. Probable sources of bacteria include failing septic systems and agricultural land uses.

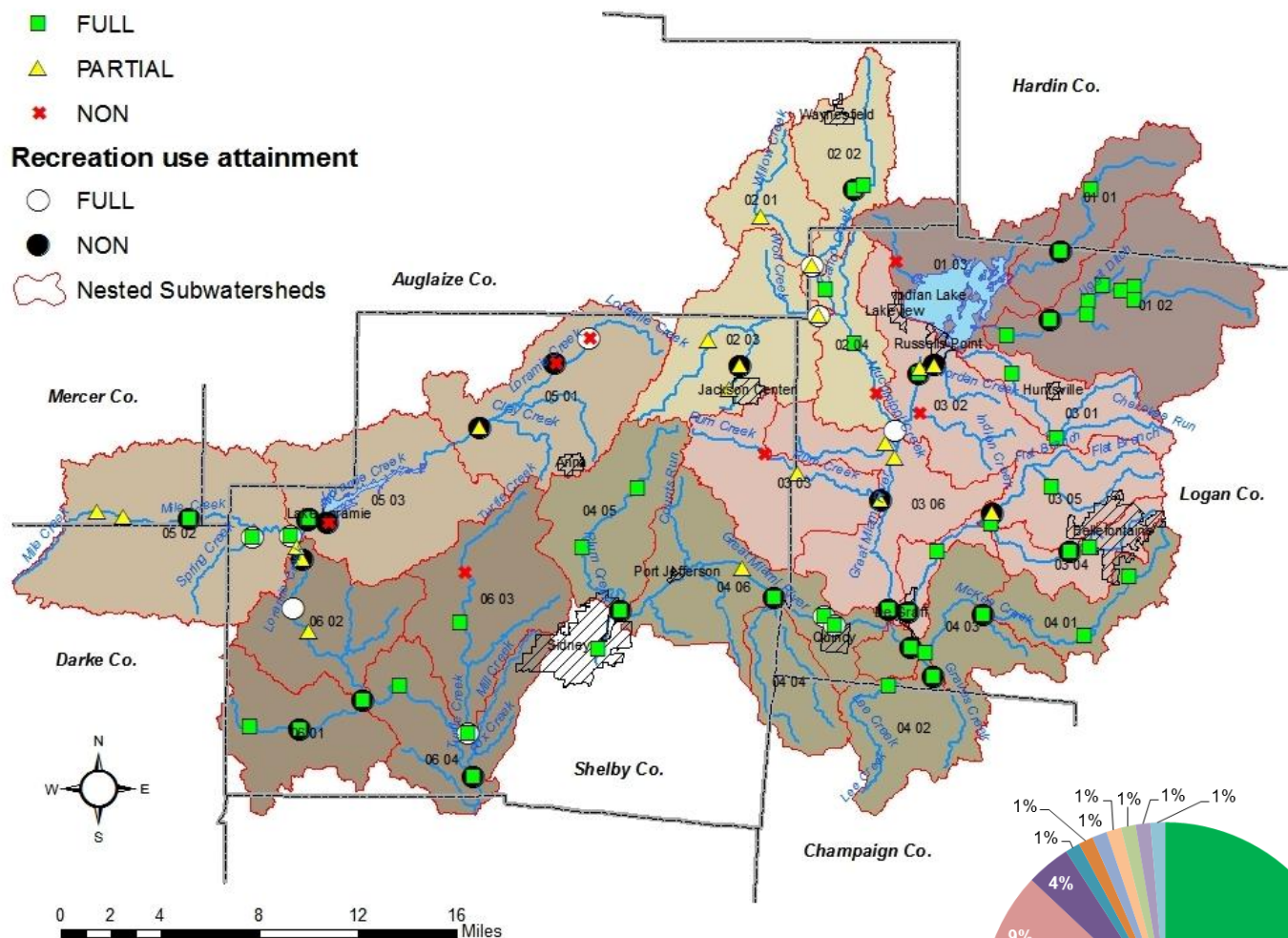
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Aquatic Life Use Attainment

- FULL
- ▲ PARTIAL
- ✱ NON

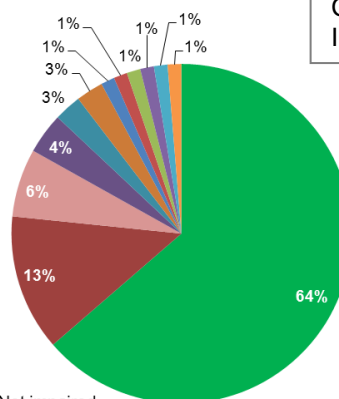
Recreation use attainment

- FULL
- NON
- ⬭ Nested Subwatersheds



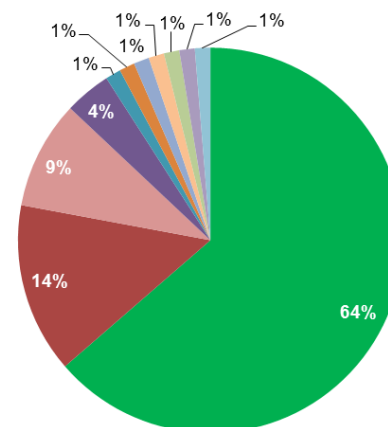
What are the problems?

Causes of Impairment



- Not impaired
- Habitat alterations
- Habitat alterations, nutrients
- Sediment, flow regime alterations, habitat alterations
- Habitat alterations, phosphorus
- Habitat alterations, sediment
- Habitat alterations, nutrients, sediment
- Nutrients, low flow alterations
- Nutrients, habitat alterations, total dissolved solids
- Flow regime and habitat alterations, organic enrichment, sediment
- Phosphorus
- Sediment

Sources of Impairment



- Not impaired
- Channelization
- Agriculture, channelization
- Agriculture, channelization, point sources
- Agriculture, point sources
- Channelization, impoundment, point sources, agriculture
- Channelization, impoundment, cattle access
- Impoundment
- Impoundment, agriculture, channelization
- Impoundment, channelization
- Point sources, channelization

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How can the problems be fixed?

05

- Phosphorus limit at Botkins STP, Anna STP, Minster WWTP, Osgood WWTP and Lake Loramie SSSD.
- Improve riparian and/or in-stream habitat where channelization has occurred.
- Implement BMPs to slow and treat agricultural runoff.
- Investigate modifying the Lake Loramie dam to increase summer flows.

02

- Phosphorus limit at Jackson Center WWTP.
- Improve riparian and/or in-stream habitat where channelization has occurred.
- Implement BMPs to slow and treat agricultural runoff.
- Restrict livestock access to streams.
- Remove large log jams to restore natural flow.

01

- Improve riparian and/or in-stream habitat where channelization has occurred.
- Implement BMPs to slow and treat agricultural runoff.
- Restrict livestock access to streams.

03

- Total dissolved solids limit at Botkins STP.
- Improve riparian and/or in-stream habitat where channelization has occurred.
- Implement BMPs to slow and treat agricultural runoff.
- Restrict livestock access to streams.
- Investigate modifying the Indian Lake dam to increase summer flows.

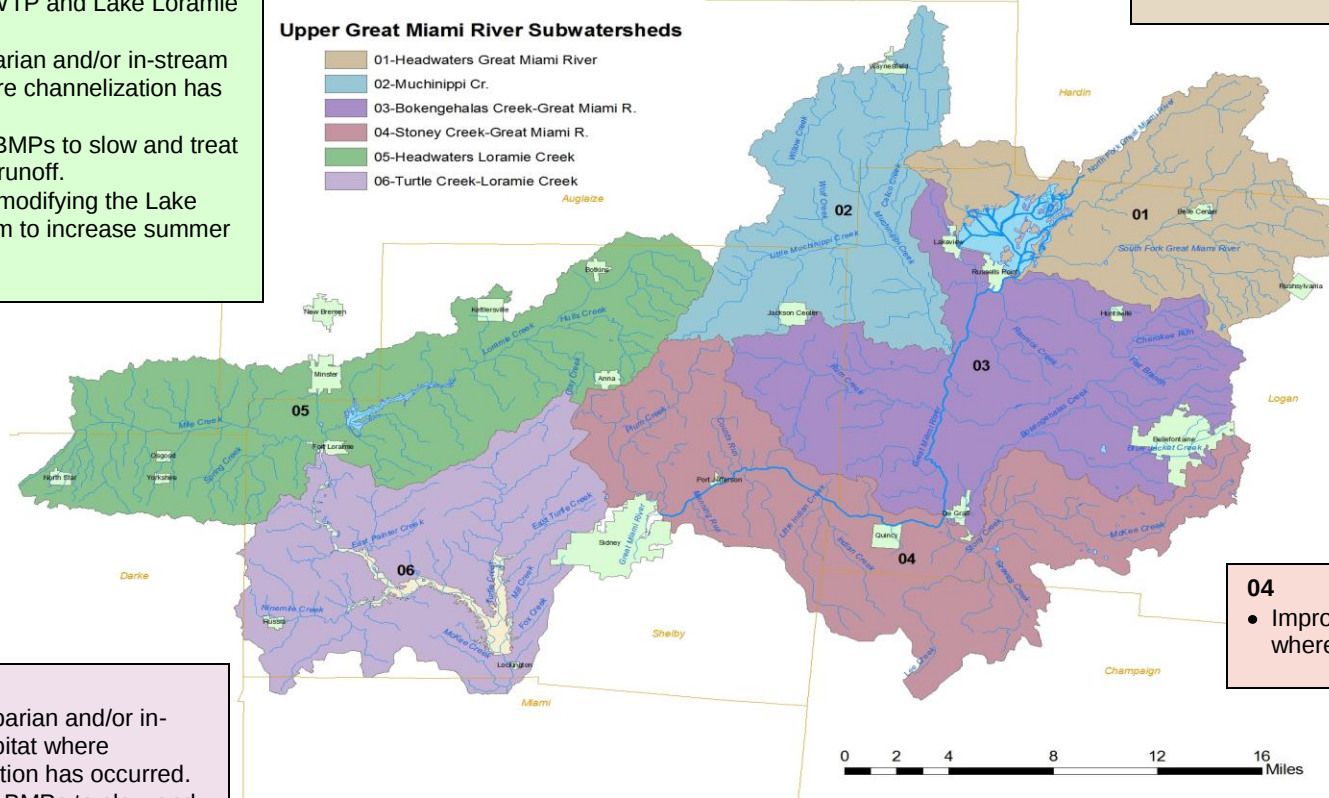
04

- Improve riparian and/or in-stream habitat where channelization has occurred.

06

- Improve riparian and/or in-stream habitat where channelization has occurred.
- Implement BMPs to slow and treat agricultural runoff.

Upper Great Miami River Subwatersheds



To reduce bacteria throughout the watershed:

- Inspect home sewage treatment systems (HSTS); replace or repair failing HSTS.
- Reduce runoff from farm fields spread with manure by implementing runoff-reducing best management practices.
- Ensure that livestock do not have access to streams. Install alternative water supplies where necessary.
- Use manure management best management practices on farms.
- Investigate tying unsewered communities into wastewater treatment plants.
- Address sanitary sewer overflow issues in Quincy and DeGraff.
- Reduce storm runoff in urban areas through storm water best management practices that treat runoff before it enters a stream.

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What are the most important “fixes” in the watershed?

- ◆ **Reduce sediment and nutrient loading from the landscape, especially cropland**
 - *Protect soil surface with cover crops and residues which also tie-up nutrients*
 - *Increase the retention of water in treatment areas such as filter strips or in the soil profile with controls on subsurface drainage systems*
- ◆ **Reduce the amount of phosphorus and bacteria entering the streams**
 - *Reduce phosphorus loading from waste water treatment plants*
 - *Fix or replace failing home sewage treatment systems to reduce bacteria*
 - *Fence livestock out of streams and provide alternative water supplies for them to reduce bacteria*
- ◆ **Improve the quality of stream channels and their corridors**
 - *Facilitate floodplain connection and growth of riparian trees and vegetation*
 - *Utilize alternative ditch designs (e.g., two-stage ditches and over-wide ditches) where appropriate*

What actions are needed to improve water quality?

There are a variety of reasons why streams in the Great Miami River (upper) watershed fail to meet water quality goals, so several types of actions are needed to improve and protect the watershed.

The recommendations focus on reducing pollutant loads and/or increasing the capacity of the streams to better handle the remaining pollutant loads. Sources of water quality problems that should be focused on making water quality improvements include:

- Pollutants in cropland runoff and tile drainage.
- Failing home sewage treatment systems.
- Wastewater treatment and collection systems.

Who can improve the situation?

Implementation of this report's recommendations will be accomplished by federal, state and local partners, including the voluntary efforts of landowners.

Ohio EPA will issue permits to point source dischargers that are consistent with the findings of this TMDL report.

The Ohio Department of Natural Resources has programs dedicated to abating pollution from certain agricultural practices; promoting soil, water, and wildlife conservation; and dealing with storm water and floodplain protection. County agencies often work with state and federal partners in administering federal and state assistance programs to people in their counties. Several such programs are available to address home septic system upgrades and agricultural and urban conservation practices.

There are two active watershed groups in the area. The Indian Lake Watershed Project was formed in 1990 to address sedimentation and water quality issues by promoting nutrient management for fertilizer and manure application. Their efforts to change farming practices led

to an 80% reduction in sedimentation, greatly improving lake clarity. The Loramie Watershed Alliance promotes conservation practices to reduce sedimentation and nutrient inputs as well as promoting log jam removals with retention of wooded riparian zones.

The Miami Conservancy District is also active in the watershed. The Great Miami River Network is a coalition of citizen groups and agencies who share information at quarterly meetings held at various locations within the watershed. The Nutrient Trading program is designed to reduce nutrient loads to the river by providing financial incentives to farmers for conservation practices.

Additional funding may come available for agricultural conservation practices through provisions in the Farm Bill for buffer strips, wetlands and other land conservation practices.

Where can I learn more?

The Ohio EPA report containing the findings of the watershed survey, as well as general information on TMDLs, water quality standards, 208 planning, permitting and other Ohio EPA programs, is available at <http://www.epa.ohio.gov/dsw/tmdl/index.aspx>.

The Great Miami River (upper) watershed draft TMDL report was available for public review from November 30, 2011 through January 5, 2012. The final report was approved U.S. EPA on March 26, 2012. The report is available at <http://www.epa.ohio.gov/dsw/tmdl/GreatMiamiRiverUpperTMDL.aspx>.

For further information please contact Beth Risley, Ohio EPA Division of Surface Water, P.O. Box 1049, Columbus, OH 43216 or email beth.risley@epa.state.oh.us.