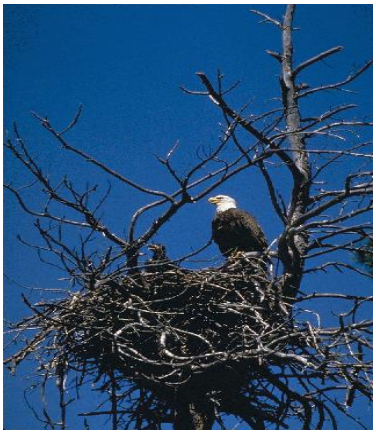
The Michigan Department of Environmental Quality Biennial Remedial Action Plan Update for the River Raisin Area of Concern



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Purpose of the Biennial Remedial Action Plan Update

A Michigan Department of Environmental Quality (MDEQ) Biennial Remedial Action Plan (RAP) Update will be prepared at least every 2 years for each Area of Concern (AOC), and will be the primary tool for documenting and communicating progress to the public and agencies. These documents are meant to be brief, user-friendly updates on recent remedial actions and assessments in the AOC. They are prepared by the MDEQ in consultation with the Public Advisory Council (PAC) and the U.S. Environmental Protection Agency (USEPA). These biennial RAP updates will also be posted on the MDEQ AOC web site.

The biennial RAP update is one component of the MDEQ's process for tracking AOC restoration, removing BUIs, and ultimately delisting AOCs. These processes and relevant restoration criteria are described in more detail in the MDEQ's *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (*Guidance*) (MDEQ, 2006).

The purpose of this River Raisin biennial RAP update is to track progress in the AOC by providing an update on those remedial actions completed in recent years. This update will discuss BUI assessment results that are based on the readiness of a BUI removal and subsequent technical committee review and recommendations. Comprehensive background information is provided in the 1987 River Raisin RAP document (Michigan Department of Natural Resources [MDNR], 1987).

How to Use this Document

For each of the nine BUIs identified in the River Raisin AOC, this biennial RAP update includes:

- A description of the significance of the BUI based on previous RAP documentation
- A summary of the restoration criteria for the BUI outlined in the *Guidance* document
- A brief summary of relevant remedial actions, if any, completed in recent years
- A brief summary of the technical committee's assessment results, if any, completed in recent years
- A list of annotated references and studies that may be used by a technical committee when the MDEQ AOC coordinator, in consultation with the PAC, determines the BUI is ready for formal review of remedial actions and restoration according to the applicable criteria.

Introduction

Background

In 1987, amendments to the Great Lakes Water Quality Agreement (GLWQA) were adopted by the federal governments of the U.S. and Canada. Annex 2 of the amendments listed 14 BUIs which are caused by a detrimental change in the chemical, physical, or biological integrity of the Great Lakes system (International Joint Commission, 1988). The Annex directed the two countries to identify AOCs that did not meet the objectives of the GLWQA. The RAPs addressing the BUIs were to be prepared for all 43 AOCs identified, including the River Raisin. The BUIs provided a tool for describing effects of the contamination, and a means for focusing remedial actions.

The 1987 River Raisin RAP identified nine of the GLWQA's 14 beneficial uses as being impaired (MDNR, 1987). These impairments have been primarily caused by historical discharges of oils and grease, heavy metals, and polychlorinated biphenyls (PCBs) to the river from industrial facilities in the area. Additionally, industrial and municipal waste disposal sites adjacent to the river were suspected of contaminating the river and have also caused a significant loss of fish and wildlife habitat. Between 2007 and 2008, the River Raisin PAC voted to adopt the statewide restoration criteria included in the *Guidance* to evaluate the status of the BUIs. In 2008, a Fish and Wildlife Technical Committee was formed to develop local restoration criteria for the Loss of Fish and Wildlife Habitat and Degradation of Fish and Wildlife Populations BUIs. Table 1 is a matrix for tracking the progress of assessments and removal of BUIs from the River Raisin AOC.

Table 1. River Raisin BUI Removal Matrix.

Beneficial Use Impairment	Beneficial Use Remains Impaired	Assessment in Progress	BUI Removed
Restrictions on fish and wildlife consumption	x		
Bird or animal deformities or reproductive problems	x		
Degradation of benthos	x		
Restrictions on dredging activities	x		
Eutrophication or undesirable algae	x		
Beach closings	x		
Degradation of aesthetics	x		
Degradation of fish and wildlife populations	x		
Loss of fish and wildlife habitat	x		

The River Raisin AOC is located in Monroe County, in the southeastern portion of Michigan's Lower Peninsula. The boundary of the AOC includes the lower 2.6 miles of the River Raisin (Figure 1), downstream from Dam No. 6 at Winchester Bridge in the City of Monroe, extending one-half mile into Lake Erie following the federal navigation channel and along the nearshore zone of Lake Erie both north and south, for one mile (MDNR, 1987).

Figure 1. The River Raisin Area of Concern.

Restrictions on Fish and Wildlife Consumption

Significance in the River Raisin Area of Concern

Due to PCB contamination in the lower River Raisin, there is a no consumption advisory for carp and channel catfish taken from the River Raisin below the Monroe Dam, including the Detroit Edison Corporate levee. There is also consumption advisories below the Monroe Dam for black buffalo, freshwater drum (for women and children only), smallmouth bass, and white bass (Michigan Department of Community Health [MDCH], 2008).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. Because the fish consumption advisory in the River Raisin AOC is more stringent than for Lake Erie, this BUI will be assessed using either a comparison study or trend analysis.

Remedial Actions

See the Degradation of Benthos section below for recent remedial actions completed on contaminated sediments in the River Raisin AOC.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

Bohr, J., and J. Zbytowski. 2007. Michigan Fish Contaminant Monitoring Program: 2006 Annual Report. MDEQ-WB Report #MI/DEQ/WB-07/053.

Bohr, J. and J. Zbytowski. 2008. Michigan Fish Contaminant Monitoring Program: 2007 Annual Report. MDEQ-WB Report MI/DEQ/WB-08/029.

The MDEQ's fixed station whole fish contaminant trend monitoring project was initiated to measure spatial and temporal trends of certain bioaccumulative contaminants.

Michigan Department of Community Health. 2008. 2008 Michigan Family Fish Consumption Guide: Important Facts to Know if You Eat Michigan Fish. https://www.michigan.gov/mdhhs/safety-injury-prev/environmental-health/topics/eatsafefish

Certain kinds and sizes of fish from the Great Lakes, and some Michigan lakes and streams, contain levels of toxic chemicals that may be harmful if those fish are eaten too often. The MDCH advises caution about eating Michigan fish for the general population, women of childbearing age, and children under 15 years old.

Bird or Animal Deformities or Reproductive Problems

Significance in the River Raisin Area of Concern

Prior to the late 1940's, the River Raisin AOC contained over 800 acres of wetlands and was considered a renowned hunting and fishing destination (MDNR, 1987). However, recognizing the potential for industrial development in the lower reaches, the Monroe Port Commission

allowed the filling of most of the wetlands. Industrialization of this area resulted in several contaminated waste sites on both sides of the river (MDNR, 1987). Today, the remaining wildlife habitat, especially the Eagle Island Marsh (formerly the Ford Marsh) and the Port of Monroe Landfill lagoons adjacent to Plum Creek (in the immediate vicinity of the AOC), are home to nesting eagles, a colony of ring billed and herring gulls, a number of wintering bald eagles, and other aquatic birds (D. Best, personal communication, October 24, 2006).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. According to the *Guidance*, restoration of this beneficial use will be demonstrated using one of two approaches. The approach taken will depend on the availability of data. The first approach evaluates restoration based on field assessment of birds and/or other wildlife where MDEQ or other state-approved bird and wildlife data are available. The second approach will be applied where bird or other wildlife data are not available. This approach will use levels of contaminated fish tissue known to cause reproductive or developmental problems as an indicator of the likelihood deformities or reproductive problems may exist in the AOC.

Remedial Actions

No remedial actions have occurred 2006 RAP Update.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

Michigan Department of Environmental Quality. 2004. Michigan Wildlife Contamination Trend Monitoring. Year 2002 Annual Report. Nestling Bald Eagles. MI/DEQ/WD-04/024.

Michigan Department of Environmental Quality. 2008. Michigan Wildlife Contamination Trend Monitoring. Year 2004 Annual Report. Nestling Bald Eagles. MI/DEQ/WB-08/085.

Since 1999, the MDEQ has funded researchers at Michigan State University (MSU) and Clemson University to measure contaminant levels in bald eagle blood and feathers each year. Bald eagle productivity is also monitored. Eaglets from selected nests have been monitored annually, while others have been sampled according to the MDEQ's five-year rotating watershed cycle. Samples are analyzed for PCBs, mercury, dichlorodiphenyltrichloroethane (DDT), and a few other selected pesticides (Edly and Wuycheck, 2006).

The same researchers monitoring bald eagles are also assessing contaminant levels (PCBs, DDT, and mercury) in herring gull eggs. This project complements and expands existing herring gull egg monitoring conducted by the Canadian Wildlife Service. The data are used for trend assessment of near-shore areas of the Great Lakes (Edly and Wuycheck, 2006).

Degradation of Benthos

Significance in the River Raisin Area of Concern

According to the 1987 RAP, benthic impairments were listed due to PCB contamination from a variety of sources from within and outside of the AOC, including: contaminated sediments, waste disposal sites and industrial point sources located along the river; heavy metals from urban non-point sources; suspended solids from combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs); oil and grease from industrial point sources, and urban non-point sources (MDNR, 1987).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. According to the *Guidance*, the restoration criteria for this beneficial use requires that all remedial actions for known contaminated sediment sites with degraded benthos are completed (except for minor repairs required during operation and maintenance) and monitored according to the approved plan for the site.

Remedial Actions

No remedial actions have occurred since the 2006 RAP Update.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

MACTEC. 2003. Draft Remedial Alternatives Evaluation Report Addendum RiverRaisin 307 Site.

The purpose of the addendum was to document the results of the additional sediment sampling investigation in the River Raisin navigational channel. The investigation was conducted by MACTEC Engineering and Consulting of Michigan, Inc. (MACTEC, formerly Harding ESE, Inc.) and directed by the MDEQ. The specific objective of the investigation was to verify historical sampling results of PCB impacted areas at select locations within the AOC. The sample locations were selected to verify historical data prior to the design of remedial action. In addition, MACTEC calculated the volume of sediment which contained 80 percent of the total PCB mass, and the volume of sediment in five areas selected by the MDEQ for remediation.

USEPA. 2003. Post-Remediation Sediment Sampling on the Raisin River Near Monroe, Michigan. Final Results from 2001-2002 Survey: PCB Chemistry, Caged Fished and Bioaccumulation Results. *(The link provided was broken and has been removed)*

In 2001 and 2002 the USEPA - Great Lakes National Program Office, in conjunction with the US Army Corps of Engineers (USACE) - Detroit District and the MDEQ conducted an extensive survey of sediment quality conditions within the Raisin River AOC. The focus of the survey was to evaluate the levels of PCB contamination remaining in the area of the Ford Motor Company sediment remediation project completed in 1997. The survey

also collected data to evaluate the quality of sediments in the AOC outside the removal area. The assessment focused on PCBs, the primary contaminant of concern within the AOC, but also included analysis of other chemical constituents.

Restrictions on Dredging Activities

Significance in the River Raisin Area of Concern

In 1981, samples collected for the USACE revealed elevated levels of PCBs in sediments located from the Monroe Waste Water Treatment Plant (WWTP) to Lake Erie (MDNR, 1987). The highest concentrations were found in and immediately downstream of the turning basin. Later In 1983 and 1984, it was noted that PCB concentrations in sediment increased from the turning basin to the Detroit Edison Power Plant water intake (Harding, 2002). In 1991, a MSU investigation found high levels of PCBs (40,000 ppm) in sediments located near the outlet of a former Ford Motor Company wastewater discharge pipe. This pipe was located on the north side of the River Raisin just downstream from the turning basin.

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. According to the *Guidance*, this beneficial use will be considered restored when either there have been no restrictions on routine commercial or recreational navigational channel dredging by the USACE, based on the most recent dredging cycle; or, in cases where dredging restrictions exist, a comparison of sediment contaminant data from the commercial or recreational navigation channel (at the time of proposed dredging) in the AOC indicates that contaminant levels are not statistically different from other comparable, non-AOC commercial or recreational navigation channels.

Remedial Actions

See the 2006 RAP Update for remedial actions completed.

Assessment Results

This beneficial use is currently impaired. A Dredging Technical Committee, formed by the MDEQ and comprised of state and federal agency experts, conducted an initial statewide assessment of this BUI in 2008 and found that restrictions on dredging do exist within the River Raisin AOC due to chemical contamination. No further statewide assessment is planned at this time. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for another formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

Great Lakes Dredging Team. 1999. Decision Making Process for Dredged Material Management. Draft Final, October 13, 1998, Amendment #1, January 18, 1999. Available at: *(The link provided was broken and has been removed.)*

This document describes how to manage the dredged material, management options, treatment technologies available, the technical evaluation process, and regulatory information.

Eutrophication or Undesirable Algae

Significance in the River Raisin Area of Concern

According to the 1987 River Raisin RAP, water quality in the river between the 1960s and 1970s was considered generally poor (MDNR, 1987). Low flow in the summer months caused nutrients from upstream sources to accumulate in the AOC, causing the water quality to assume a "sludge-like character" and undesirable algae growth (Cyr, 2002). Monitoring during the mid-1970s showed that turbidity and total phosphorus was consistently high, indicative of highly eutrophic conditions, and was likely related more to runoff from agriculture in the upper watershed rather than municipal or industrial discharges in the AOC (SEMCOG, 1978, as cited in MDNR, 1987).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. According to the *Guidance*, this beneficial use will be considered restored when there are no waterbodies within the AOC included on the list of impaired waters due to nutrients or excessive algal growths in the most recent Clean Water Act *Water Quality and Pollution Control in Michigan: Section 303(d) and 305(b) Integrated Report* (Integrated Report), which is submitted to USEPA every two years.

In addition, the MDEQ is in the process of developing nutrient criteria for state surface waters which will be adopted into Michigan's WQS. The MDEQ will evaluate restoration of this BUI consistent with the nutrient criteria once the nutrient criteria are approved by the USEPA and adopted into rule.

Remedial Actions

Remedial efforts have been ongoing in the upper watershed to address nutrient loadings. For example, the River Raisin watershed is one of three priority watersheds under the Michigan's Conservation Reserve Enhancement Program (CREP). Since 2001, the CREP has provided landowners with cost-share assistance in establishing conservation practices, including establishing riparian buffers, grass plantings, field windbreaks, filter strips, wetland restoration, controlled livestock access, and conservation easements. As of January 30, 2009, the CREP has enrolled over 14,724 acres of land in the River Raisin watershed (personal communication, John Suppnick, February 25, 2009).

In 2007, the River Raisin PAC received grants to remove gates in the low head dams within the city of Monroe to lower the water and provide an opportunity for volunteers to wade in the river and hand-pull flowering rush, an invasive species that has become problematic and promotes the build-up of algae and other debris. The combination of lowering the water levels and pulling the flowering rush likely increased the flow and oxygen levels in the water. The increased flow also carries sediment further down stream, preventing a build up in the impoundment areas, thus improving overall water quality. For more information, see the City of Monroe Commission on the Environment's flowering rush eradication program website: *(The link provided was broken and has been removed.)*

See the Beach Closings section below for recent remedial actions completed that have helped address eutrophication and algae issues in the River Raisin AOC.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and

assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

Aiello, C. 2008. Michigan Water Chemistry Monitoring Great Lakes Tributaries 1998-2005 Report. Michigan Department of Environmental Quality, Water Bureau, Report #MI/DEQ/ WB-08/014. Available at: Michigan.gov/-/media/Project/Websites/egle/Documents/Programs/ WRD/GLWARM/Monitoring-Watershed/Statewide/tributaries-1998-2005.pdf

The Water Chemistry Monitoring Project allows for the calculation of contaminant loadings from key Michigan tributaries. The key goals of this project are to: 1) assess the current status and condition of individual waterbodies and determine whether standards are being met, 2) measure temporal and spatial trends, 3) detect new and emerging water quality problems, and 4) provide data to support MDEQ water quality programs and evaluate their effectiveness.

Heidelberg College Tributary Monitoring Program: https://www.heidelberg.edu/tributary-data-download

Since 1982, the Heidelberg College Water Quality Laboratory has collected water samples from the River Raisin as part of its Ohio Tributary Monitoring Program. These samples have been collected at a U.S. Geological Survey (USGS) stream gaging station approximately 12 miles upstream from the mouth of the river. Water samples are analyzed for major nutrients and suspended solids. The data also provide uniquely detailed data sets on ambient water quality in the river and may support investigations on pollutant sources and transport into the River Raisin AOC.

Suppnick, J. and GLEC. 2006. Conservation Reserve Enhancement Program 2004 Annual Water Quality Monitoring Report. Report #MI/DEQ/WB-06/109.

Suppnick, J. and GLEC. 2007a. Conservation Reserve Enhancement Program 2005 Annual Water Quality Monitoring Report. Report #MI/DEQ/WB-08/019.

Suppnick J. and GLEC. 2007b. Conservation Reserve Enhancement Program Vegetative Filter Strip Effectiveness Modeling. Report #MI/DEQ/WB-07/118

The MDEQ works closely with the Michigan Department of Agriculture to implement the CREP, a federal-state-local conservation partnership designed to reduce significant environmental effects related to agriculture. The CREP is being implemented in three critical watersheds (Saginaw Bay, Macatawa River, and River Raisin) that have intense agricultural land use. The objectives of the program are to improve and protect water quality and to promote and enhance wildlife habitat by providing incentives to Michigan citizens for implementing conservation practices for a period of 15 years (Edly and Wuycheck, 2006).

Beach Closings

Significance in the River Raisin Area of Concern

The only public beach within the AOC is located at the Sterling State Park. The swimming beach is located within one mile north of the mouth of the River Raisin (Figure 1). Historically, the park was closed to swimming due to *E. coli* contamination from the River Raisin (R. Micka, personal communication, December 11, 2006). Today, because all of the River Raisin water

flows through the Detroit Edison Power Plant and is discharged into Plum Creek, which discharges over one mile downstream from the mouth of the River Raisin, the threat of bacterial contamination at the park has been reduced (R. Micka, personal communication, December 11, 2006). However, recreational contact with surface water contaminated with bacteria is an ongoing concern in the river. Bacterial contamination within the lower river has been attributed to inputs from the upper watershed, including discharges from upstream wastewater facilities, periodic SSOs and CSOs from upstream municipalities, and failed septic systems and agricultural inputs from rural areas (D. Stefanski, personal communication, December 11 and 12, 2006).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for this BUI. The statewide criteria for this BUI was revised in 2008 to account for AOCs listed as having CSO(s), or considered impacted by an upstream CSO(s). The criteria revision outlines a three tiered approach.

The first tier requires that no waterbodies within the AOC are included on the 303(d) list of impaired waters due to contamination with pathogens in the most recent Integrated Report. If the waterbody is listed due to the presence of CSOs, or are impacted by upstream CSOs, the second criteria states that this BUI will be considered restored when updated information reveals that the CSOs have been eliminated or are being treated. Or, In cases where CSOs still exist and significant progress has been made towards their elimination or treatment, the third tier allows monitoring data to be used to document that water quality standards for *E. coli* are generally met, which enables removal of the BUI.

Remedial Actions

As of January 1987, the Monroe WWTP discontinued discharging into the River Raisin by moving the outfall to Plum Creek, outside the boundary of the AOC (MDNR, 1987).

In August 2005, a $142,345 Clean Michigan Initiative grant was awarded to the Monroe County Drain Commissioner's Office to implement Phase II of the USEPA's stormwater program. This project is in the final phase and nearing completion. The investigations have proven effective in identifying and eliminating illicit discharges, (e.g., sanitary wastewater and effluent from septic tanks) and improved water quality in Monroe County. To date, 407 illicit discharges have been investigated and closed. The project will be completed in 2009.

In 2007, the River Raisin PAC received a PAC Support Grant to better define the potential source(s) of *E. coli* contamination within the AOC. The sampling conducted provided enough evidence for the MDEQ to conclude that a Total Maximum Daily Load should be established within the boundary of River Raisin AOC. The lower portion of the river will likely be listed as impaired in the 2010 Integrated Report.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

CSO & SSO Discharge website: *(The link provided was broken and has been removed.)*

Facilities are required to report that a CSO and SSO discharge event occurred within 24 hours of the initial discharge. Later, after the event ends, a written report is submitted which contains additional information including volume of the discharge, and the start/end date and time. This information is posted on the above website.

Degradation of Aesthetics

Significance in the River Raisin Area of Concern

According to the 1987 River Raisin RAP, the Ford Motor Company was a potential source of excessive levels of oil and grease to the AOC by way of direct discharge from its manufacturing operations (MDNR, 1987). Studies conducted in the River Raisin during the 1960s through the 1980s also documented poor water quality due in part to high turbidity, high suspended solids (especially from the Monroe WWTP and upstream areas), and total phosphorus loadings (MDNR, 1987).

Restoration Criteria

The River Raisin PAC has accepted the state's criteria for restoring this beneficial use. The *Guidance* criteria require that monitoring data be collected for two successive monitoring cycles to determine whether or not the water bodies in the AOC exhibit persistent, high levels of the following "unnatural physical properties" (as defined by Rule 323.1050 of the Michigan Water Quality Standards) in quantities which interfere with the state's designated uses for surface waters:

turbidity
color
oil films
floating solids
foams
settleable solids
suspended solids
deposits

The MDEQ does not routinely monitor this stretch of river for degraded aesthetic conditions. However, once this BUI is ready to be assessed, MDEQ will monitor for aesthetic conditions during ongoing monitoring projects and/or work with other local water quality efforts to determine the aesthetic status. For example, the MDEQ's Water Chemistry Monitoring Project does collect data in the AOC on a routine basis, which includes analysis for turbidity and suspended solids from a station located within the AOC. The Heidelberg College Tributary Monitoring Program also collects data on major nutrients and suspended solids approximately 12 miles upstream from the river mouth.

Remedial Actions

See the Eutrophication or Undesirable Algae and Beach Closings sections above for recent remedial actions related to aesthetics in the River Raisin AOC.

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove this BUI.

Annotated References and Studies

Aiello, C. 2006. Michigan Water Chemistry Trend Monitoring Great Lakes Tributaries 2004 Report. Michigan Department of Environmental Quality Water Division. Report #MI/DEQ/WD-06/045.

The Water Chemistry Monitoring Project allows for the calculation of contaminant loadings from key Michigan tributaries. The key goals of this project are to: 1) assess the current status and condition of individual waterbodies and determine whether standards are being met, 2) measure temporal and spatial trends, 3) to detect new and emerging water quality problems, and 4) provide data to support MDEQ water quality programs and evaluate their effectiveness. Water chemistry reports are available at: https://www.michigan.gov/egle/about/Organization/Water-Resources/GLWARM/water-chemistry

Heidelberg College Tributary Monitoring Program: https://www.heidelberg.edu/tributary-data-download

Since 1982, the Heidelberg College Water Quality Laboratory has collected water samples from the River Raisin as part of its Ohio Tributary Monitoring Program. These samples have been collected at a USGS stream gaging station approximately 12 miles upstream from the mouth of the river. Water samples are analyzed for major nutrients and suspended solids. The data also provide uniquely detailed data sets on ambient water quality in the river and may support investigations on pollutant sources and transport into the River Raisin AOC.

Loss of Fish and Wildlife Habitat
Degradation of Fish and Wildlife Populations

Significance in the River Raisin Area of Concern

The current sites of Ford Motor Company Stamping Plant (now Automotive Components Holdings, LLC) and Detroit Edison's Power Plant were once the sites of renowned hunting and fishing lodges (MDNR, 1987). As the area underwent intense industrial development in the early and mid-1900s, the extensive fish and wildlife habitat was eliminated. Subsequently, water quality and biota became susceptible to significant point and non-point source contaminants. Fish populations became impaired due to combined sewer overflows and residual chlorine from the WWTP; oil and grease from industrial point sources; and in particular, PCBs and heavy metals from contaminated sediments, waste disposal sites and other point sources located along both sides of the river (MDNR, 1987).

Biotic impairment is not limited to municipal and industrial loadings. The large water demand required to operate the Detroit Edison power plant has impacted the hydrology of the lower river by withdrawing nearly all of river water and diverting it to the power plant water intake, where it is discharged via the Detroit Edison Corporate levee into Plum Creek. The alteration of water flow has resulted in significant impacts to the River Raisin fishery and is responsible for the entrainment of planktonic organisms and the impingement of millions of fish against the plant's water intake screens (MDNR, 1987).

Restoration Criteria

The River Raisin Fish and Wildlife Technical Committee, comprised of representatives from the MDEQ, MDNR, River Raisin PAC, and other local stakeholders established criteria for restoration of these BUIs (Environmental Consulting & Technology, Inc. 2008).

The restoration criteria for the River Raisin AOC are:

- Degradation of Fish and Wildlife Populations BUI - The reach of the River Raisin within the AOC supports a diverse fish community.

- Loss of Fish and Wildlife Habitat BUI - Meet delisting target for Degradation of Fish and Wildlife Populations BUI.

Additional habitat actions have been identified by the River Raisin Fish and Wildlife Technical Committee that go beyond what is minimally needed to remove these BUIs, but were included in the Plan to raise awareness, and if addressed, may have a positive impact on the habitat conditions in the River Raisin. These actions include removal of contaminated sediments from the AOC and reducing sediment loading to the river through watershed management improvement projects (e.g., filter strips, bank stabilization projects, soil stabilization).

Removal of the fish and wildlife BUIs will be based on achievement of full implementation of remedial actions, including monitoring conducted according to site plans and showing consistent improvement in quantity of habitat addressed in the restoration targets. Habitat values and populations need not be fully restored prior to delisting, as some may take many years to recover after actions are complete.

Remedial Actions

Section 316(b) of the Clean Water Act requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. This requirement is implemented through the National Pollutant Discharge Elimination System (NPDES) permit program. The MDEQ, in conjunction with MDNR, is responsible for this program in the state of Michigan. In compliance with its NPDES permit, DTE has submitted all information pertaining to the 316(b) requirement for its Monroe Power Plant to the MDEQ. It is expected that compliance to the 316(b) regulations that typically require reductions in fish mortality by nearly 80%, will result in significantly improved mortality of various species through the intake structures (ECT, Inc. 2008).

Assessment Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the River Raisin PAC determine that this BUI is ready for a formal review and assessment. The technical committee will review the results of all remedial actions completed and other supporting documentation to provide a decision on whether or not to support a recommendation to formally remove these BUIs.

Annotated References and Studies

Environmental Consulting and Technologies, Inc. 2008. Delisting Targets for Fish/Wildlife Habitat and Population Related Beneficial Use Impairments for theRiver Raisin Area of Concern. Final Draft 12/2/08.

This report was prepared for the River Raisin PAC and contains criteria for these BUIs, background on the impairments, the development process, and scope of work to restore these BUIs.

References

Cry, T. 2002. The River Raisin Remedial Action Plan Update – Draft.

Edly, K. and J. Wuycheck. 2006. Water Quality and Pollution Control in Michigan: 2006 Sections 303(d), 305(b), and 314 Integrated Report. Report #MI/DEQ/WB-06/019.

Environmental Consulting & Technology, Inc. 2008. Delisting Targets for Fish/Wildlife Habitat & Population Related Beneficial Use Impairments For the River Raisin Area of Concern. Final Draft 12/2/08.

International Joint Commission. 1988. Revised Great Lakes Water Quality Agreement of 1978, as amended by Protocol signed November 18, 1987. Consolidated by the International Joint Commission, United States and Canada.
(The link provided was broken and has been removed)

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Michigan.gov/egle/about/Organization/Water-Resources/glwarm/integrated-report

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