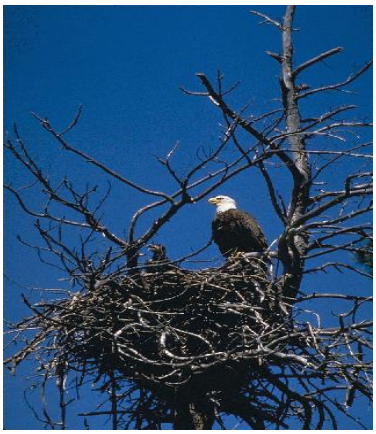
The Michigan Department of Environmental Quality Biennial Remedial Action Plan Update for the Clinton River Area of Concern



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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 Beneficial Use Impairments (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* (MDEQ, 2008).

The purpose of this Clinton River 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 1988 Clinton River RAP document (Michigan Department of Natural Resources [MDNR], 1988).

How to Use this Document

For each of the eight BUIs in the Clinton River 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 activities and 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 Clinton River. The BUIs provided a tool for describing effects of the contamination, and a means for focusing remedial actions.

The 1988 Clinton River RAP identified 8 of the GLWQA's 14 beneficial uses as being impaired (MDNR, 1988). Table 1 is a matrix for tracking the progress of assessments and removal of these BUIs from the Clinton River AOC. These impairments have been primarily caused by historical contamination by conventional pollutants, including high fecal coliform bacteria and nutrients; high total dissolved solids; sediment contaminants, including heavy metals, polychlorinated biphenyls (PCBs), and oils and grease; and impacted biota.

Table 1. Clinton River BUI Removal Matrix.

Beneficial Use Impairment	Beneficial Use Remains Impaired	Assessment in Progress	BUI Removed
Restrictions on fish and wildlife consumption	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 original boundary for the Clinton River AOC, as stated in the 1988 RAP document, was defined as the main branch of the Clinton River and spillway downstream of Red Run. The remainder of the Clinton River watershed was considered the Source Area of Concern (MDNR, 1988). This document also identified numerous point and nonpoint sources of pollution throughout the Clinton River's mainstream and major tributaries and described the impacts to the mainstream and tributaries upstream of the boundaries to Red Run Drain.

In 1995, the MDEQ, in conjunction with the Clinton River PAC, completed a RAP Update for the Clinton River AOC. The update stated that the original 1988 RAP was largely completed prior to the 1987 Amendments to the GLWQA, and as such, the 1995 RAP Update would serve to revisit the impairments based on the list of BUIs outlined in the 1987 Amendments and evaluate those impairments at the watershed scale. The 1995 RAP Update stated that the boundaries of the Clinton River AOC have been "redefined, and now encompass the entire watershed." This was due to further evaluation of water quality conditions in the early 1990s, and in light of the BUIs identified in the 1987 Amendments. The 1998 RAP Update reiterated the 1995 determination that the entire watershed was the AOC, but expanded the AOC boundary to include "the nearshore area of Lake St. Clair impacted by the Clinton River and its spillway" (MDEQ, 1998).

The revised Clinton River AOC boundary now includes Oakland and Macomb Counties, with small portions extending into Lapeer and St. Clair Counties, encompassing the entire Clinton River watershed. The boundary includes the Clinton River and its tributaries, as well as the spillway and nearshore area of Lake St. Clair between the mouth of the Clinton River and the spillway (Figure 1.). These are the boundaries that the MDEQ and the public have been working with for the last 10+ years in planning and implementing appropriate remedial measures, and monitoring for restoration success in the AOC.

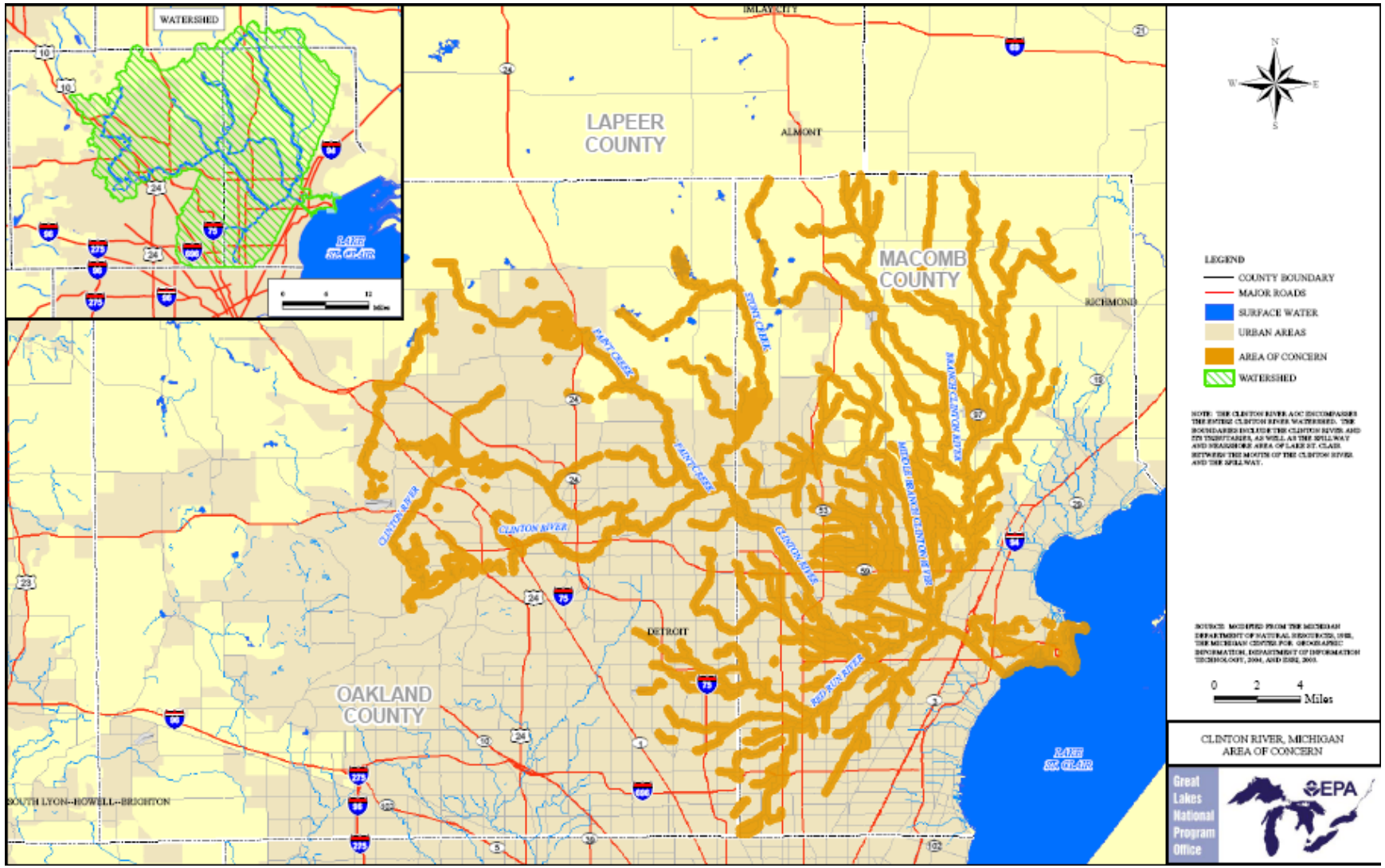

Figure 1. The Clinton River Area of Concern.

Degradation of Benthos

Significance in the Clinton River Area of Concern
According to the 1988 RAP, benthic impairments were due to historical PCB contamination from a variety of sources from within the AOC, including: contaminated sediments, waste disposal sites and industrial point sources located along the river; heavy metals from urban non-point sources, waste disposal sites, and industrial point sources; suspended solids from combined sewer overflows (CSOs); and oil and grease from industrial point sources, urban non-point sources, and CSOs (MDNR, 1988).

Restoration Criteria
The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions
No remedial actions were reported to have taken place within the Clinton River AOC during the period covered by this update.

Assessment Results
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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
Goodwin, K. 2005. Biological Assessment of the Clinton River Watershed Lapeer, Macomb, and Oakland Counties, Michigan. Michigan Department of Environmental Quality, Water Bureau. Report #MI/DEQ/WB-05/124.

As part of the five year watershed review cycle, staff biologists from the MDEQ SWAS conducted qualitative biological assessments in the Clinton River Watershed. These surveys were conducted using the Procedure #51 (MDEQ, 1990). The survey objectives included: qualitative characterization of the macro-invertebrate community with respect to existing habitat conditions at sites, determine attainment status of the watershed, provide data to support permitting, and provide assistance to existing non-point source activities.

Restrictions on Fish and Wildlife Consumption

Significance in the Clinton River Area of Concern
As a result of the historical PCB contamination in the Clinton River, a fish contamination and consumption advisory has been identified as an impaired use in the AOC (MDNR, 1988). The Michigan Department of Community Health (MDCH), "Michigan Family Fish Consumption Guide", recommends various consumption advisories below the Yates Dam for carp and rock bass for women and children only, but there are no consumption advisories for the general public (MDCH, 2008).

Restoration Criteria
The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions
See Degradation of Benthos BUI above for recent remedial actions completed on contaminated sediments within the Clinton River AOC.

Assessment Results
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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. 2006. Michigan Fish Contaminant Monitoring Program: 2005 Annual Report. MDEQ-WB Report #MI/DEQ/WB-06/091. http://www.deq.state.mi.us/documents/deq-wb-swas-fcmpreport2005.pdf

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. Michigan Family Fish Consumption Guide: Important Facts to Know if You Eat Michigan Fish. Available at: http://www.michigan.gov/mdch/1,1607,7-132-2944_5327-13110--,00.html

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.

Restrictions on Dredging Activities

Significance in the Clinton River Area of Concern
Sediments in the lower portion of the Clinton River watershed from Pontiac downstream to the mouth of the river are moderately to heavily contaminated with metals, semi-volatile organic compounds, petroleum hydrocarbons, PCBs, and dichlorodiphenyl trichloroethane (DDT) (MDEQ, 1998).

In general, the headwaters regions of the Clinton River are not degraded due to toxic contamination, but are degraded from the surrounding watershed areas. There are historical isolated areas in the headwaters requiring source identification and control for metals and some semi-volatile organic compounds. These areas include the Main Branch of the Clinton River at Dixie Highway in Clarkston, Upper Paint Creek downstream of Newman Road, Salt Slang Drain on the east side of the Garfield Road overpass, Newland Inter-county Drain at the north end of Almont Road Conduit, and Coon Creek Inter-county Drain at Pratt Road (MDEQ, 1995).

Sediments of the Main Branch of the Clinton River from Pontiac to the confluence with Red Run Drain are moderately contaminated with metals, petroleum hydrocarbons, some semi-volatile organic compounds, and nitrogen. Based on historical data, the contamination is fairly widespread throughout this portion of the river (MDEQ, 1995). In comparison, sediments from the Red Run Drain/Plum Brook drainage have historically been moderately to heavily contaminated with metals, petroleum hydrocarbons, semi-volatile organic compounds, and

nitrogen. Contaminants of particular concern are mercury and PCBs because they have caused fish consumption advisories (MDEQ, 1995).

The remainder of the downstream portion of the river and the spillway are the most heavily contaminated reaches within the watershed. Elevated levels of metals, petroleum hydrocarbons, semi-volatile organic compounds, nitrogen, PCBs, and DDT (and its breakdown products dichlorodiphenyl dichloroethylene [DDE] and dichlorodiphenyl dichloroethane [DDD]) are common in the sediments. The presence of DDT, DDE and DDD has been found localized in the lower strata of the sediment cores indicating historical usage of these contaminants. PCBs, where present, are commonly found in the surficial sediments as well as in deeper strata (MDEQ, 1995).

Restoration Criteria
The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions
See Degradation of Benthos BUI above for recent remedial actions completed on contaminated sediments within the Clinton River AOC.

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 Clinton River AOC due to chemical contamination. No further statewide assessment is planned at this time.

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: http://www.glc.org/dredging/dmm/decision.pdf

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

Eutrophication or Undesirable Algae

Significance in the Clinton River Area of Concern
According to the 1988 Clinton River RAP, monitoring during the 1970s showed that turbidity and total phosphorus was consistently high, indicative of eutrophic conditions (MDEQ, 1988). The Clinton River has also experienced excessive algal growth in the lower portion of the river primarily due to high nutrients from stormwater runoff and low flow in the river (MDEQ, 1998). In addition, historically there were a number of residential and commercial properties within communities in the Clinton River watershed that used failing septic systems or had illegal connections to storm sewer systems. Even today, these properties potentially serve as sources of nutrients discharging to the river.

Restoration Criteria
The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions
See Degradation of Benthos BUI above for recent remedial actions completed on nutrient inputs within the Clinton River AOC.

Assessment Activities and Results
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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 (see below) 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: http://www.michigan.gov/documents/deq/wb-swas-9805tribreport_222804_7.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.

Beach Closings

Significance in the Clinton River Area of Concern
The only public beach located in the Clinton River AOC is the Huron-Clinton Metropolitan Authority Metropolitan Beach. Therefore, recreational contact with surface water contaminated with bacteria is an ongoing concern. The potential sources of bacterial contamination throughout the watershed include discharges from upstream wastewater facilities, especially CSOs, urban and rural stormwater runoff, failing septic systems, and illegal connections to storm sewers.

Restoration Criteria
The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions
See Degradation of Benthos BUI above for recent remedial actions completed on nutrient inputs within the Clinton River AOC.

Assessment Activities and Results
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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 (see below) 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: http://www.deq.state.mi.us/csosso/find_event.asp

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 Clinton River Area of Concern

Degradation of Aesthetics was originally identified as an impaired use due to widespread erosion, in-stream sedimentation, localized algal blooms, habitat degradation, and litter throughout the watershed (MDEQ, 1998). In addition, studies conducted in the Clinton River during the 1970s documented poor water quality due in part to high turbidity, high suspended solids, and total phosphorus loadings (MDNR, 1988).

Restoration Criteria

The Clinton River PAC is currently considering accepting the State's criteria for restoring this beneficial use.

Remedial Actions

- Clinton Cleanup – annual event held in the fall for volunteers to remove debris from the river.

- Clean Boating Campaign – organized by the local health departments and the U.S. Coast Guard, this campaign educates marine owners on how to minimize oil spills and refuse within marinas.

See also Degradation of Benthos BUI above for recent remedial actions completed on nutrient inputs within the Clinton River AOC.

Assessment Activities and Results

This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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 (see below) 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: http://www.michigan.gov/documents/deq/wb-swas-9805tribreport_222804_7.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) to detect new and emerging water quality problems, and 4) provide data to support MDEQ water quality programs and evaluate their effectiveness.

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

Significance in the Clinton River Area of Concern
In the 1990's, Oakland County led the state in new construction, followed by Macomb County. Very rapid urban expansion and insufficient land use planning within the Clinton River watershed has led to degradation of fish and wildlife habitat. Wetlands and other wildlife habitat have been almost entirely eliminated from the downstream portion of the basin, and natural drainage has been drastically altered throughout the watershed.

The geology of the area and the increasing amount of impervious surfaces has resulted in a variable stream flow within the Clinton River watershed. Low flows during dry periods and high flows that scour stream channels and banks during rainstorms have resulted in loss of fish habitat. In addition, seawalls, dredging, and draining have reduced or eliminated hydrologic connections between wetlands and their source of water, which has made it difficult to manage the hydrology of the river (MDEQ 1995).

Historically, the North Branch of the Clinton River was a significant spawning area for walleye migrating from Lake St. Clair. Dams and lake level controls upstream and west of Pontiac prevented natural flows, or reduced the flow to a trickle, severely impacting the fish population in the river. Modifications to the spillway weir were completed in 1997 which now diverts more water to the Clinton River during low flow periods (MDEQ, 1998).

The Clinton River was once had a rich assemblage of unique native mussels (MDEQ, 1995). Currently, these native mussel populations have been impacted by in-stream sedimentation and potentially, out-competed by the exotic zebra mussel.

Restoration Criteria
Per the *Guidance*, these two BUIs are considered together in recognition of the integral relationship between them. The restoration criteria outlined in the *Guidance* is a process for local PACs to use to develop locally-derived restoration targets and plans for fish and wildlife habitat and populations. The Clinton River PAC is currently in the process of developing restoration criteria. The finalized restoration plans will be part of future biennial RAP updates, and will contain at least the following components:

- A short narrative on historical fish and wildlife habitat or population issues in the AOC
- Description of the impairment(s) and location for each aquatic habitat or population site(s) to address all habitat or population issues identified in the RAP documents
- A locally derived restoration target for each impacted habitat or population site
- A list of all other ongoing habitat or population planning processes in the AOC
- A scope of work for restoring each impacted aquatic habitat or population site
- A component for reporting on habitat or population restoration implementation action(s) to the MDEQ.

Removal of this BUI will be based on achievement of full implementation of actions in the steps above. Habitat values and populations need not be fully restored prior to delisting, as some may take many years to recover after actions are complete. Actions already implemented in the AOC may be reported and evaluated as long as the documentation contains all of the elements above.

Remedial Actions
No remedial actions were reported to have taken place within the Clinton River AOC during the period covered by this update.

Assessment Activities and Results
This beneficial use is currently impaired. A technical committee will be convened when the MDEQ and the Clinton River 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.

References

LeSage, S. and J. Smith. 2008. Water Quality and Pollution Control in Michigan: 2008 Sections 303(d), 305(b), and 314 Integrated Report. Report MI/DEQ/WB-08/007. Available at: http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-12711--,00.html

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