# DELISTING TARGETS FOR FISH/WILDLIFE HABITAT & POPULATION RELATED BENEFICIAL USE IMPAIRMENTS FOR THE RIVER RAISIN AREA OF CONCERN

Submitted to the Michigan Department of Environmental Quality

---

December 2, 2008

Submitted by:

Environmental Consulting & Technology, Inc.

2200 Commonwealth Blvd, Suite 300
Ann Arbor, MI 48105
Ph: 734-769-3004
Fax: 734-769-3164

# ACKNOWLEDGMENTS

We would like to acknowledge the United States Environmental Protection Agency's (EPA) Great Lakes National Program Office (GLNPO) for funding this important initiative. At GLNPO, thanks are due to Mr. Tony Kizlauskas (Contract Manager), Ms. Vicki Thomas, and Mr. Mark Elster (both Senior Advisors) for facilitating various administrative components of this project. Michigan Department of Environmental Quality (MDEQ) played a key role in ensuring that the project deliverables were focused. At MDEQ, we thank Ms. Michelle Selzer for her hands-on, constructive approach to this project.

Many other experts contributed their time, efforts, and talent toward the preparation of this report. The Project Team acknowledges the contributions of each of the following members of the River Raisin Delisting Target Technical Committee, and thanks them for their efforts:

Mr. Jeff Braunscheidel, Michigan Department of Natural Resources

Mr. John Cullen, MASCO

Mr. Scott Dierks, JF New

Mr. Steve Dushane, Detroit River International Wildlife Refuge

Mr. John Emig, Johnson & Anderson

Mr. Matt Herbert, The Nature Conservancy

Mr. Rick Kleinsmith, Boles Harbor Environmental Center

Ms. Tracey Kling, Monroe County Community College

Mr. Pat Lewis, City of Monroe

Mr. Richard Micka, River Raisin Public Advisory Council

Mr. David Miller, Ford Motor Corporation

Mr. Mike Neumann, Previously with River Raisin Institute

Mr. Rob Peven, Monroe County Planning

Ms. Maureen Pfund, Monroe County Environmental Health Department

Mr. Joe Robison, Michigan Department of Natural Resources

Ms. Michelle Selzer, Michigan Department of Environmental Quality

Mr. Matt Shakelford, Detroit Edison

Mr. Dan Stefanski, Monroe County Drain Commissioner

Project Team:

Mr. Roy Schrameck, Environmental Consulting & Technology, Inc. (Lead Technical Resource)

Ms. Lisa Lenfestey, Environmental Consulting & Technology, Inc. (Project Manager)

Dr. Sanjiv Sinha, Environmental Consulting & Technology, Inc. (Project Director)

## TABLE OF CONTENTS

1.0 Executive Summary ---------- 1

2.0 Project Introduction and Rationale ---------- 3
2.1 Project Rationale ---------- 3
2.2 Fish and Wildlife Habitat and Population Beneficial Use Impairments in the Raisin River AOC ---------- 4

3.0 Component A: Historical Habitat and Population Issues in the AOC ---------- 6

4.0 Component B: Habitat and Population Impairments ---------- 8
4.1 Contaminated Sediment – PCB Hotspot ---------- 8
4.2 Fish and Wildlife Populations ---------- 9

5.0 Component C: Delisting Targets for Fish and Wildlife Habitat/Population BUIs ---------- 11
5.1 Delisting Guidance Provided in the Draft Remedial Action Plan Update ---------- 11
5.2 Overarching Delisting Targets ---------- 12

6.0 Component D: Recent and Ongoing Planning and Restoration Efforts ---------- 13

7.0 Component E: Sites for Habitat and Population BUI Restoration ---------- 16

8.0 Component F: Reporting on Implementation of Habitat and Population Restoration Projects ---------- 20

9.0 References ---------- 21

## LIST OF TABLES

2-1: Summary of Fish and Wildlife Habitat/Population Related Beneficial Use Impairments in the River Raisin AOC ---------- 5

5-1: Overarching Delisting Targets ---------- 12

## LIST OF FIGURES

2-1: River Raisin AOC and Contributing Watershed ---------- 4

3-1: River Raisin AOC Boundary ---------- 6

4-1: River Raisin AOC's Five Sediment Hot Spot Locations ---------- 8

7-1: Locations of Suggested Restoration Projects in River Raisin AOC ---------- 16

## 1.0 EXECUTIVE SUMMARY

The River Raisin Area of Concern (AOC) delisting targets project was initiated to define endpoints that would allow for the ultimate delisting of the area as an AOC under the Great Lakes Water Quality Agreement. This report presents the delisting targets for fish and wildlife habitat and population-related Beneficial Use Impairments (BUIs), and presents an acceptable approach to the fairly common situation where the Remedial Action Plan (RAP) documents do not recommend site specific actions and the restoration plans recommended for delisting targets need to be developed relatively independent of the existing RAP.

Current Michigan Department of Environmental Quality (MDEQ) guidance for developing delisting targets includes the need to develop local restoration plans for the Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat BUIs. The approach reflected in the ultimate delisting target recommendations within this report reflect the need to develop the necessary site specific inventory, prioritization, and implementation steps that are part of the local restoration plan needed to actually accomplish the BUI delisting. These draft plans have been finalized with the assistance of the Technical Committee. The site specific projects identified as a part of setting the delisting targets include all of the potential habitat restoration projects deemed feasible by the Technical Committee considering site specific impairments, property ownership and other considerations. Implementation of these projects will be a key step to accomplish delisting and a move toward full restoration thus benefiting the area residents and users of the River Raisin as well as Lake Erie.

The *Guidance for Delisting Michigan's Great Lakes Areas of Concern* published by MDEQ outlines the process of developing delisting targets for habitat and population BUIs within Michigan's AOCs (MDEQ 2006). The guidance outlines six components and steps that are required for developing a local, site specific restoration plan. Those six components are listed below:

A. Narrative on the historical habitat and population issues in the AOC
B. Description of the impairment(s) and location for each site
C. Locally derived restoration target for each site
D. List of all ongoing related habitat and population planning processes in the AOC
E. Scope of work for each site, including:
    1. Timetable
    2. Funding
    3. Responsible Entities
    4. Indicator & Monitoring
    5. Public Involvement
F. Method for project reporting to MDEQ

All items, A through F, are addressed in this document. Chapter 2 introduces the project and provides a rationale for developing targets. Chapter 3 describes the historical fish and wildlife habitat and population issues in the AOC and describes the important linkages between water quality and these observed fish and wildlife impairments. Chapter 4 provides information regarding specific fish and wildlife habitat and population impairments across the AOC, including the connections to the original

issues identified in the RAP. Chapter 5 leads into the discussion of the delisting targets with supporting background information. Chapter 6 provides an outline of ongoing planning processes and implementation projects across the AOC that have demonstrated improvements to these habitat and population impairments. Chapter 7 provides a list of restoration projects, each with a defined scope of work, needed to work towards delisting these two BUIs. Finally, Chapter 8 outlines a mechanism for reporting to the MDEQ on progress made during the implementation process.

# 2.0 PROJECT INTRODUCTION AND RATIONALE

## 2.1 PROJECT RATIONALE

The original listing of AOCs within the Great Lakes was based on the presence of BUIs. These BUIs were defined by the International Joint Commission (IJC) along with generalized criteria for determining when a beneficial use was impaired (Statewide Public Advisory Council [PAC] for Michigan Areas of Concern Program 2004). The first set of guidance for delisting target was put forth in 1991 by the IJC. These criteria were fairly general, and led to a more specific set of guidance published by the U.S. Environmental Protection Agency (EPA) in 2001.

In 2006, the MDEQ released their final delisting document applicable to AOCs within the Michigan portion of the Great Lakes (MDEQ 2006). The MDEQ guidance is very specific regarding targets for non-habitat related BUIs and in general can be applied to AOCs throughout Michigan with minimal variation. In developing the guidance however it became apparent to the MDEQ that it would be impossible to adopt a single target for habitat/population related BUIs that could be applied throughout Michigan. There are often significant variations within an AOC with respect to the habitat and the ability of the restored habitat to support the same degree of fish and wildlife populations. This observation is magnified if one tries to apply a single target throughout all of Michigan AOCs. Therefore, MDEQ's guidance for fish and wildlife habitat and population related BUI removal is based on a process that requires the development and implementation of AOC specific delisting targets and a restoration plan. MDEQ will review and approve the restoration plan and the final delisting targets determined by the PAC in each AOC.

The primary goal of developing delisting targets is to create an endpoint for measuring progress in the remediation of the area and, restoration of the fish and wildlife BUIs that were considered to be impaired within the AOC and documented in the River Raisin Remedial Action Plans (RAP). In addition to removing the fish and wildlife BUIs associated with the AOC, restoration of the AOC will also provide numerous ancillary benefits including:

- A potential increase in property values within the AOC following restoration;
- Increased desirability of the AOC for investment and development following elimination of the AOC designation;
- Increased public use and enjoyment of the River Raisin associated with increased active recreational uses such as fishing; and
- Increased public use and enjoyment of the River Raisin associated with increased non-active recreational uses such as wildlife viewing and the general ability to "connect with nature" as aesthetics improve in the AOC.

Ecosystem health is important to humans as well as to the fish and wildlife. Maintaining genetic diversity and healthy populations of fish and wildlife will result in immediate as well as long term benefits. The development of the fish and wildlife population and habitat related delisting targets associated with this project will provide the tools necessary to continue implementation of actions needed to restore the environmental integrity of the River Raisin.

The River Raisin AOC (in red) and contributing watershed are shown in Figure 2-1.

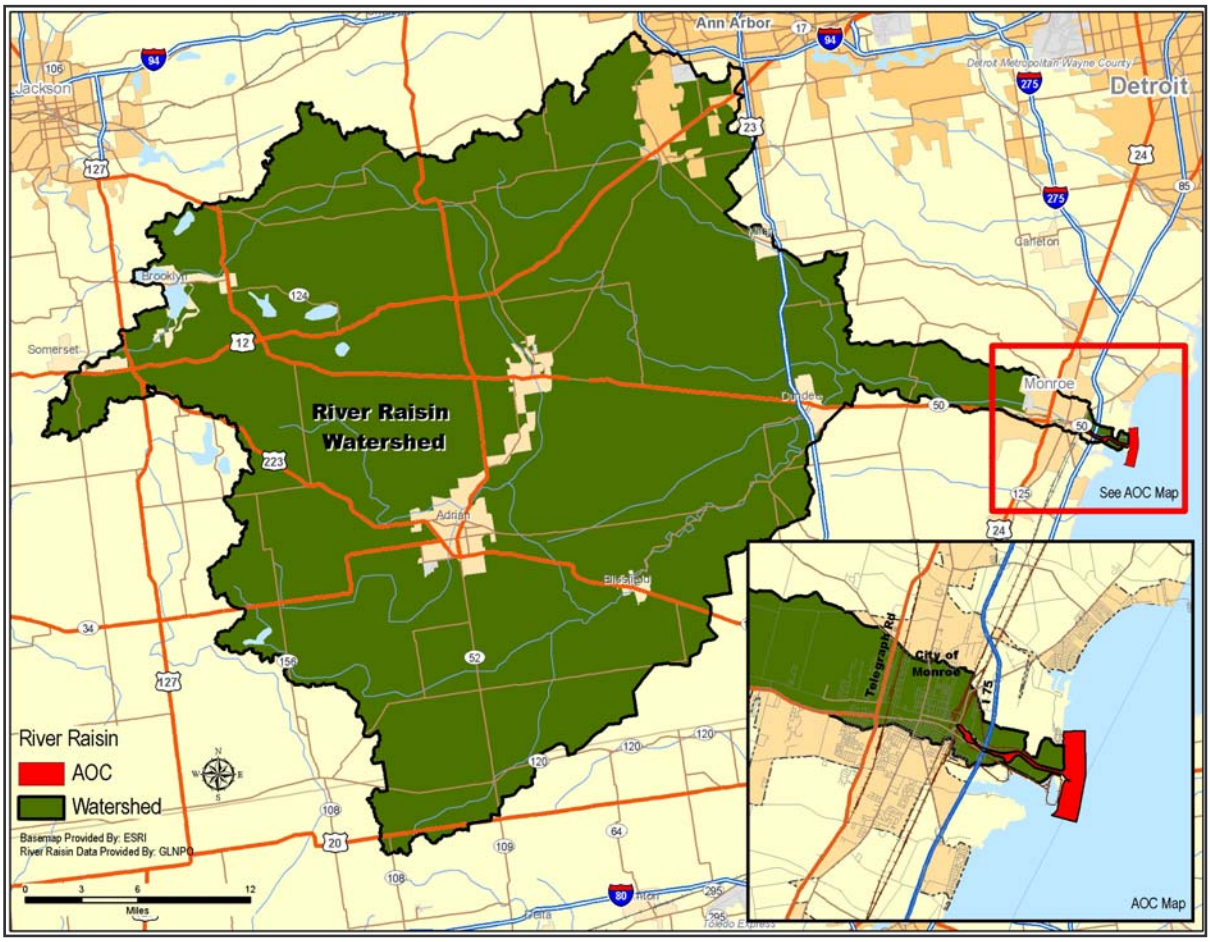


Figure 2-1: River Raisin AOC and Contributing Watershed

## 2.2 FISH AND WILDLIFE HABITAT AND POPULATION BENEFICIAL USE IMPAIRMENTS IN THE RIVER RAISIN AOC

The RAP process for the River Raisin identified nine of the Great Lakes Water Quality Agreement's 14 beneficial uses as impaired. This document will focus on the BUIs of "Loss of Fish and Wildlife Habitat" and "Degradation of Fish and Wildlife Populations". The following table depicts the two fish and wildlife population impairments as they were originally defined by the RAP Update (Cry 2002).

Table 2-1: Summary of Fish and Wildlife Habitat/Population Related Beneficial Use Impairments in the River Raisin AOC

| POTENTIAL IMPAIREMENT OF BENFICIAL USE | STATUS | | COMMENTS | PUBLIC ADVISORY COUNCIL GOALS |
|---|---|---|---|---|
| | AOC | WATERSHED | | |
| Degradation of fish and wildlife populations | Impaired (Fish) | Impaired (Fish) | Fish populations are impacted by lack of cover, sedimentation, and blocked migratory routes. | Improve and enhance the quality and quantity of fish in the AOC. |
| Loss of fish and wildlife habitat | Impaired | Impaired | Loss of wetlands continues to be of concern. Not caused by AOC. | Maintain or increase the quantity and quality of wetlands in the watershed. |

In the context of a larger AOC, it would be important to understand the linkages of habitat components that are necessary to actually sustain fish and wildlife populations. These components include food, water, shelter and places to raise young. When any of these components are negatively affected by outside influences, the habitat balance is altered and thus the population balance is also altered.

In the case of River Raisin AOC, however, given the small size of the AOC (less than two square miles), its location at the downstream end of a watershed, and use of the area as a commercial harbor, the opportunities for addressing all of the required components necessary for sustaining fish and wildlife populations are limited. The Technical Committee attempted to identify all areas for restoration that would increase the availability of habitat for spawning, nursing and feeding within the AOC while working within the limitations of the AOC.

## 3.0 COMPONENT A: HISTORICAL HABITAT AND POPULATION ISSUES IN THE AOC

The River Raisin AOC is located in southeastern Michigan in Monroe County. The AOC includes the lower 2.6 miles of river from the low head dam at Winchester Bridge downstream to the River's outlet. It further extends one-half mile into Lake Erie following the federal navigational channel and one mile along the near shore zone of Lake Erie, both north and south of the river mouth. The AOC boundary is presented in Figure 3-1.

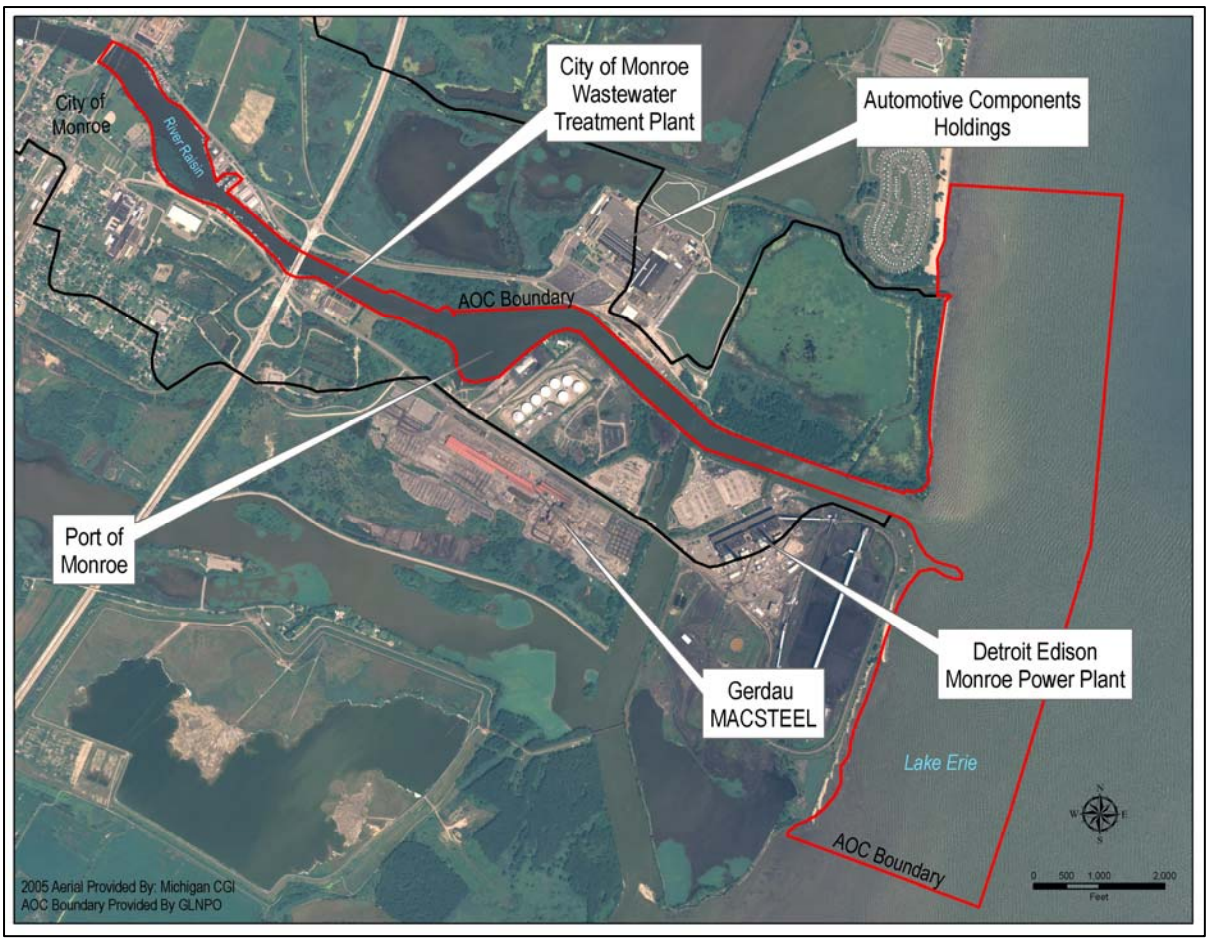


Figure 3-1: River Raisin AOC Boundary

One of the most significant historic impacts to pre-existing wetlands and sediment quality within the River Raisin AOC was the construction of the Port of Monroe, the associated navigational channel and the turning basin. In 1932, by a special election and city resolution, the Port of Monroe was incorporated. Industrial lands that had been assembled by the Monroe Industrial Commission for the purposes of industrial development were transferred to the Port of Monroe for use by the Port Commission "for the best interests of the community of Monroe included in the Port District". In the 1930's, the US Government began dredging the navigational channel and turning basin to its current alignment and depth, and the Port of Monroe completed construction of the public dock, terminal building, and lay-down areas at the turning basin. By mid to late 1930's, the turning basin and

navigational channel were ready for commercial shipping and commerce (MDNR 1987). In the mid 1940's, filling operations began on the west side of the Port of Monroe property near the present day Canadian National rail line. All filling operations occurred on the south side of the River Raisin with all operations conducted in compliance with the state and federal regulations then in affect. The primary focus of the Port of Monroe during the period of filling was to create usable, buildable land for the industrial development envisioned by the Monroe Industrial Commission, the City of Monroe, and the Port of Monroe. The main fill material used was foundry sand, a plentiful byproduct of the steel industry of the region. Fill operations continued until 1975, having created much of the Port land as it exists today south of Front Street. Fill operations on the west side of I-75 had proceeded with an unprotected face of fill. Fill operations on the east side of I-75 were conducted within a containment dike that was constructed between two existing islands in Plum Creek. This dike was constructed to function as the limits of fill operations, and had acted to retain fill materials on site. The fill procedure on the east side of I-75 created several "lagoons" or water bodies between the fill operations and the containment dike. At the bottom of these lagoons was the organic material of the natural, pre-existing wetland overlain by sediment that eroded from the fill operation (MDNR 1987).

Over time, increased urban and industrial development along the river resulted in degraded water quality, mainly due to municipal and industrial point source discharges, non-point storm water discharges, dam construction, and water withdrawal from the Detroit Edison (DTE) Monroe Power Plant. As a consequence, the River Raisin AOC has been heavily impacted by resultant organic and inorganic residues from plating operations, contaminated groundwater seepage, industrial use of PCBs, disposal of contaminated residuals, river flow and increased water temperature. During the 1960s and the 1970s, water quality and available fishery habitat in the River Raisin AOC was also considered poor due to nutrient enrichment and low dissolved oxygen. Although overall water quality showed improvements into the 1980s, violations of the following parameters continued to plague the River Raisin AOC: pH, conductivity, iron, nickel, copper, zinc, and mercury (MDEQ 1987).

Over the last decade, significant clean-up and restoration efforts have taken place in the AOC. These efforts are detailed in Chapter 6.0.

## 4.0 COMPONENT B: HABITAT AND POPULATION IMPAIRMENTS

Overall, habitat and populations impairments are generally consistent across the AOC, considering its small size. The Technical Committee focused discussions on those impairments with a potential for improvement. Two key areas are presented below that include contaminated sediment hotspots and fish/wildlife populations.

### 4.1 CONTAMINATED SEDIMENT - PCB HOTSPOT

Sediments have been a major repository for many persistent chemicals that have been introduced into surface waters of the River Raisin AOC. While sediment contamination has a direct impact on fish and wildlife populations and habitat, several other BUIs (specifically Restrictions on Dredging Activities, Restrictions on Fish and Wildlife Consumption, Degradation of Benthos, and Bird or Animal Deformities or Reproductive Problems) are also affected by it. Remediation of the remaining "hot-spots" within the AOC will be addressed during activities aimed to remove these BUIs. Therefore, the delisting targets established for the Degradation of Fish and Wildlife Populations and Loss of Fish and Wildlife Habitat BUIs will not specifically address sediment contamination remediation, or the wildlife species listed as impaired (i.e., bald eagles, ring-billed and herring gulls). Still, given the significant progress the AOC has made in identifying and remediating contaminated sediment hot spots, it is relevant to discuss the progress made. Figure 4-1 shows the locations of the five remaining sediment remediation areas within the AOC (MACTEC Engineering 2003).

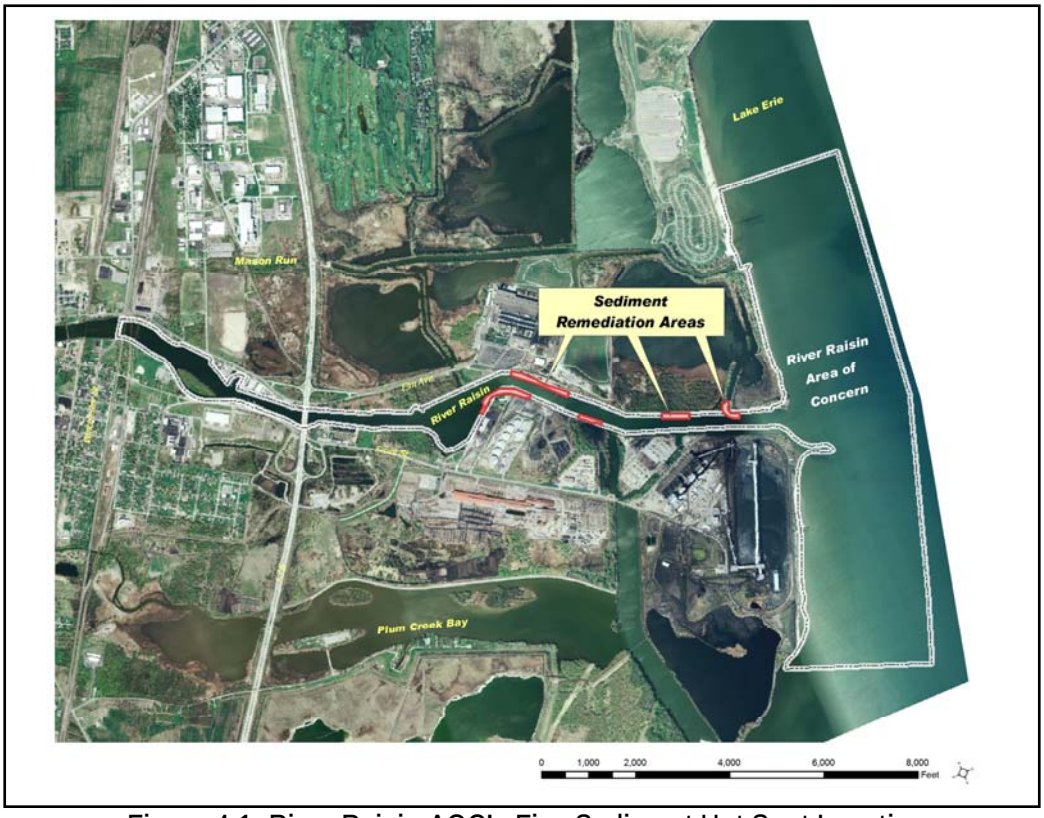


Figure 4-1: River Raisin AOC's Five Sediment Hot Spot Locations

In 1991, elevated PCBs were detected at an area on the north side of the river known as the "PCB Hot Spot" located near outfall pipes leading from the Ford Motor Company Stamping Plant (now Automotive Components Holding, LLC). In 1997, the Ford Motor Company, under an Administrative Order of Consent by EPA Superfund program, removed approximately 27,000 cubic yards of contaminated sediment from the river and placed it one of the Corrective Action Management Units provided by Ford Motor Company (MDEQ 2006).

Post remedial sediment quality surveys conducted in 2001 through 2003 by the MDEQ and EPA - Great Lakes National Program Office indicated that greater than 2,000 cubic yards of PCB-contaminated sediment remained in the "PCB Hot Spot." Sediments from the turning basin downstream showed concentrations of PCBs above levels of concern. The studies also indicated that there was significant potential for uptake of PCBs into the food web (EPA 2003). An addendum was completed for the remedial alternatives evaluation report, recommending dredging of five sites with elevated PCB concentration from the turning basin downstream, including the former Ford "PCB Hot Spot" (MACTEC 2003).

In March 2006, EPA sent a special notice letter to the Ford Motor Company requesting that they enter into negotiations with the EPA to perform a Remedial Investigation/Feasibility Study. The study would involve collecting additional samples and evaluating alternatives to remediate contamination that may pose a human threat. In August 2006, Ford responded by indicating that the PCBs found in recent sampling (since the 1997 removal action) were not the same as those that the company used in their processes. The EPA is currently evaluating Ford's response.

## 4.2 FISH AND WILDLIFE POPULATIONS

### *Fish Passage and Impingement*

It is believed that many of the small, low-head dams in the city of Monroe were built in the mid-1800s to deal with sewage and paper mill wastes, as there were several paper mills in the area at one time (MDNR 2008). The almost continuous shallow water impoundments through the city were designed to store water volume in the summer to disburse smelly wastes and avoid concentrating such waste in low summer flows. Later, the dams provided places to insert water and sewer mains. Other than during floods, the dams restrict fish passage to upstream and downstream habitat available in this reach of the river. In addition, the broken bedrock bottom in the impoundment areas provide limited habitat for fish and other aquatic species (e.g., mussels) that inhabit the lower River Raisin during part or all of their life cycle.

The primary impediment to the migration of fish species in this small AOC are the cooling water intakes at the DTE's Monroe Power Plant. 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.

### *Fish Habitat*

In the context of the larger River Raisin watershed, fish populations have been impacted by lack of cover, stream channelization, hardening of the shorelines, and stream flow. As native vegetation was removed from the watershed through conversion of land uses to urban, industrial and maritime uses, the potential for overland and channel erosion increased. This resulted in increased siltation and subsequent elimination of the clean gravel surfaces required by many fish species for spawning habitat (MDNR 1998). Restoration opportunities outlined in a recently completed River Raisin Watershed Management Plan are currently underway and should result in the enhancement of a diverse fishery in the watershed, and consequently the AOC (River Raisin Watershed Council 2008). However, many of these efforts and projects are outside of the jurisdiction of MDEQ's AOC Program as they are located outside of the AOC boundary.

### *Macroinvertebrate Community*

Aquatic invertebrate communities provide an important food source for fish, birds, mammals, reptiles, and amphibians. The River Raisin Watershed's Adopt-A-Stream Program, implemented six years ago, assesses the River Raisin watershed's streams and rivers through an assessment of the health of the macroinvertebrate community. Some aquatic invertebrates are extremely susceptible to contaminated sediments and low oxygen levels, and their absence or presence is used as an indicator of water quality. The macroinvertebrate community within the Lower Raisin was rated "good: until 2005 and in 2006, the classification dropped to "fair" and "poor."(River Raisin Watershed Council 2008). Although it is unclear why this drop in classification occurred, one possible explanation can be attributed to a decline in sample size. However, during the most recent sampling effort, the site closest to the mouth of the River (within the AOC) edged back into the "good" range (River Raisin Watershed Council 2008).

Again, it is important to underscore here that given the functionality of the AOC as a commercial harbor, the Technical Committee felt that a presence of a healthy macroinvertebrate community within the AOC is not a high priority item. Thus, while the Technical Committee promotes and encourages related efforts in the larger watershed and expects a community comparable to that of a non-AOC commercial navigation channel, it does not believe restoration projects within the AOC need to focus on the presence of a healthy macroinvertebrate community in the AOC.

# 5.0 COMPONENT C: DELISTING TARGETS FOR FISH AND WILDLIFE HABITAT & POPULATIONS BUIs

## 5.1 DELISTING GUIDANCE PROVIDED IN THE DRAFT REMEDIAL ACTION PLAN UPDATE

The River Raisin RAP published in 1987 included recommendations to address the nine listed BUIs (MDNR 1987). In 2002, the draft River Raisin RAP Update reviewed the accomplishments made with respect to the original recommendations and provided recommendations for the future (Cry 2002). While this update was never formally approved by the MDEQ, the information is carried forward in this report section as being indicative of the thought processes being employed within the AOC community during development of that update.

As stated in Table 2-1, the listed goal for the Degradation of Fish and Wildlife Populations BUI is to "improve and enhance the quality and quantity of fish in the AOC", and the goal for the Loss of Fish and Wildlife Habitat BUI is to "maintain or increase the quantity and quality of wetlands in the watershed."

Specific recommendations for delisting the nine BUIs were broadly defined in the RAP Update, that is, separate recommendations were not provided for each individual BUI. The RAP Update also incorporated broad watershed goals not necessarily specific enough to address AOC needs. The following is a brief list of activities that the River Raisin PAC had identified in the draft RAP Update that would need to be completed within the River Raisin Watershed and the AOC to "prevent or control the critical sources of pollution or address causes of impairment:"

- Remove contaminated sediments from the AOC;
- Implement best management practice in agricultural areas through a partnership with the PAC, Watershed Council, and Soil Conservation District;
- Reduce sediment loading to the river through improvement projects (including filter strips, bank stabilization projects, soil stabilization, construction site runoff control, etc.) and effective land use planning, stormwater control, floodplain management plans, and adoption of effective soil erosion and sedimentation control ordinances;
- Remediate the retention lagoons that were once part of the Consolidated Paper Company;
- Update local Master Plans and Land Use Plans and Zoning Regulations;
- Address water quality management issues in the watershed, including combined sewer and sanitary sewer overflows, illicit discharges, on-site septic and/or small wastewater treatment systems, nonpoint source pollution and agricultural runoff;
- Preserve and enhance the dwindling agricultural lands;
- Review and update floodplain regulations; and
- Complete a natural features inventory for the River Raisin Watershed.

These proposed activities were assessed by the Technical Committee and used to develop specific restoration targets presented in the next section.

## 5.2 OVERARCHING DELISTING TARGETS

The overarching delisting targets are measurable targets to be used in identifying when one of the two fish and wildlife BUIs can officially be removed from the River Raisin AOC.

Removal of the F&W BUIs will be based on achievement of full implementation of projects outlined in Section 7 of the report. Post-implementation monitoring will need to demonstrate that adequate habitat has been restored at these project sites to a level that is expected to support a diverse fish community in the AOC.

Table 5-1 details the overarching targets for each of the BUIs that were agreed upon by the Technical Committee.

Table 5-1: Overarching Delisting Targets

| Beneficial Use Impairment | Delisting Target |
|---|---|
| Degradation of Fish & Wildlife Populations | The reach of the River Raisin within the AOC supports a diverse fish community. |
| Loss of Fish & Wildlife Habitat | Meet delisting target for Degradation of Fish & Wildlife Populations BUI. |

## 6.0 COMPONENT D: RECENT AND ONGOING PLANNING AND RESTORATION EFFORTS

This River Raisin has been a hot-bed of all sorts of remedial and restoration activities since being designated as an AOC. Efforts from EPA, MDEQ, Port of Monroe, DTE, Ford, Monroe County Drain Commission, and many other stakeholders have been instrumental in the clean-up and recovery of the AOC. A summary of some of recent processes and implementation activities is presented below:

- 2007-2008: DTE led a partnership to obtain a $10,000 EPA 5-Star Grant to restore 500 feet of the River Raisin shoreline. This project, completed in summer 2008, restored a section of River Raisin shoreline at the Monroe Power Plant from concrete riprap to a more natural condition. The project has created wildlife and migratory bird habitat and enhances fishing opportunities. The concrete and stone was left in place, but a veneer of native habitat was built on top to retain the current material while at the same time providing cover, shading and improved aesthetics. Community partners on this project include: City of Monroe, Metropolitan Affairs Coalition, MDEQ, Michigan Sea Grant, Monroe Country Drain Commissioner, Monroe Lotus Garden Club, River Raisin Institute, River Raisin Watershed Council, and the Wildlife Habitat Council.
- 2008: Eradication of Flowering Rush from the River Raisin upstream from the AOC was initiated by the city of Monroe's Commission on Environment and Water Quality. Water levels were lowered by manipulating gates of several dams with the approval of the MDEQ and MDNR (Fisheries Division), and the Flowering Rush plants were harvested selectively between the dams. It is hoped that winter ice formation and low water levels will result in a complete eradication of Flowering Rush.
- 2006: The MDEQ has allocated over $11M for remediation at the Consolidated Paper Company, a known source of PCB contamination to the River Raisin. Remediation since 2006 has included the cleanup of upland PCB contaminated sludge, the cleanup of the drainage ditch of PCB contaminated sludge, and the cleanup one of the seven PCB contaminated sludge lagoons. The remaining lagoons still require further characterization and remediation, but the direct source of contamination to the AOC has been addressed.
- 2007: DTE's Monroe Power Plant was nominated for Wildlife Habitat Council's "Corporate Habitat of the Year." This nomination meant that Monroe Power Plant was recognized for their dedicated members, volunteers and partners who demonstrate excellence in the areas of wildlife habitat enhancement and restoration. It is an honor to simply be nominated. The recipients show that employing exemplary practices and approaches to protecting natural resources and the environment also promotes significant economic benefits.
- 2005: Creation of the Bolles Harbor Prairie Complex Project and Wetland Project was started at DTE's Monroe Power Plant. These projects reflect the partnership between DTE, US Fish & Wildlife Service (USFWS), Pheasants Forever, and the Monroe Public Schools. The partnership, which includes a 10-year cooperative agreement with the USFWS, restored 57 acres of farmland to prairie and 5 acres to wetland to create habitat for local and migratory wildlife populations. This wildlife habitat area is located directly adjacent to the Monroe Public Schools' Bolles Harbor Math and Science Center and allows direct access for students working at the center to engage in class projects, monitoring, and habitat management activities.

- 2005: The Automotive Components Holdings, LLC (ACH) and the USFWS entered into a cooperative management agreement to incorporate 240 acres of coastal wetlands, called Eagle Island Marsh, into the Detroit River International Wildlife Refuge. The Eagle Island Marsh is located behind the ACH's plant and is bordered by Sterling State Park to the north. This large wetland complex is unique to the region and contains marshland, transitional meadows and forested wetlands. Eagle Island Marsh supports significant beds of the threatened American Lotus (*Nelumbo lutea*), a pale yellow flower that is the nation's largest aquatic wildflower, and is the official clean water symbol of the State of Michigan.
- 2005: The Monroe County Drain Commissioner was successful in obtaining a four-year Clean Michigan Initiative grant for Illicit Discharge Elimination Program (IDEP) investigations. That grant totaled $142,000, and provides funding for investigations in all of the Monroe County Urban Area. Well over 90% of the county's urban area will be inspected by the end of September, 2009. The Monroe County Drain Commissioner also plans to conduct inspections of roadside ditches for the Monroe County Road Commission.
- 2004: The American Lotus was designated as Michigan's official symbol for clean water (P.A. 78) on April 21, 2004, in response to the return of this native, aquatic plant on the west shore of Lake Erie and the River Raisin AOC. It's recovery in this area is attributed to the implementation of the Clean Water Act (Sect. 404) pollution control programs and sustained lower water levels on the Great Lakes.
- 2004: The City of Monroe was awarded an MDEQ Coastal Management Program grant to conduct a field assessment of all open waterways within the city. This comprehensive assessment identified best management practices to address the fish and wildlife BUIs, and provided a means to implement natural resource conservation programs to restore these and other BUIs.
- 2004: The MDEQ nominated the River Raisin AOC for project funding consideration under the Great Lakes Legacy Act. The nomination is currently pending action by the EPA Superfund program.
- 2003 DTE and the USFWS entered the first cooperative management agreement to include wetlands and lake plain habitat, contained within the Fermi II power plant properties, into the Detroit River International Wildlife Refuge. The parcel known as the Lagoona Beach Unit added 656 acres to the newly formed Wildlife Refuge. Current management activities include prairie restorations as well as wetland management.
- 2003: The River Raisin Watershed Council was awarded $12,800 in grant funds to conduct a benthic macroinvertebrate community and stream habitat assessment in the River Raisin Watershed.
- 2002: Utilities on the west shore of Lake Erie opened their gates to public tours of emergent beds of American Lotus for the first time, thanks to the efforts of the Lotus Garden Club, Monroe, Michigan. The lotus flower then became a model for MDEQ Clean Corporate Citizen Status for these utilities and helped DTE's Monroe Power Plant achieve ISO 14001 Certification, which means that they have minimized how their operations negatively affect the environment (cause adverse changes to air, water, or land) and that they are complying with applicable laws and regulations.

- 2001: MDNR planned a $12 million to rehabilitate the sterling State Park and provide better access to the public.
- 2000: The return of flora and fauna to the River Raisin AOC was observed once the substantial remediation of a toxic "hot spot" occurred in 1997 by Ford Motor Company. Deformities plaguing the resident eagle population were mitigated and large concentrations of this species numbering 100 or more are observed over-wintering in or near the AOC.

## 7.0 COMPONENT E: SITES FOR HABITAT AND POPULATION BUI RESTORATION

Due to fact that the River Raisin AOC is an active harbor and located within an industrial area in the City of Monroe, a limited number of potential habitat restoration opportunities exist. It was determined that key sources of impairments to fish populations include lack of spawning and nursery habitat. In some areas, valuable but degraded shallow water habitat exists within the AOC or immediately adjacent to the AOC, however, aquatic species are not currently able to access or fully utilize these areas. Restoration of, or access to, this existing habitat will improve the quality and quantity of the fish populations, and will help to sustain a diverse fish community within the AOC. These same areas will also serve as important feeding and nesting sites for waterfowl and raptors that make the most of this same kind of habitat within the AOC during all or part of the year. The Technical committee also identified the need to conduct a fish community assessment to document what the current situation is in the AOC or to show when the delisting target has been achieved. This assessment would not only provide a base from which to evaluate improvements, it could also show what changes are necessary or if the fish community might already be of sufficient "quality and quantity" to warrant delisting this BUI.

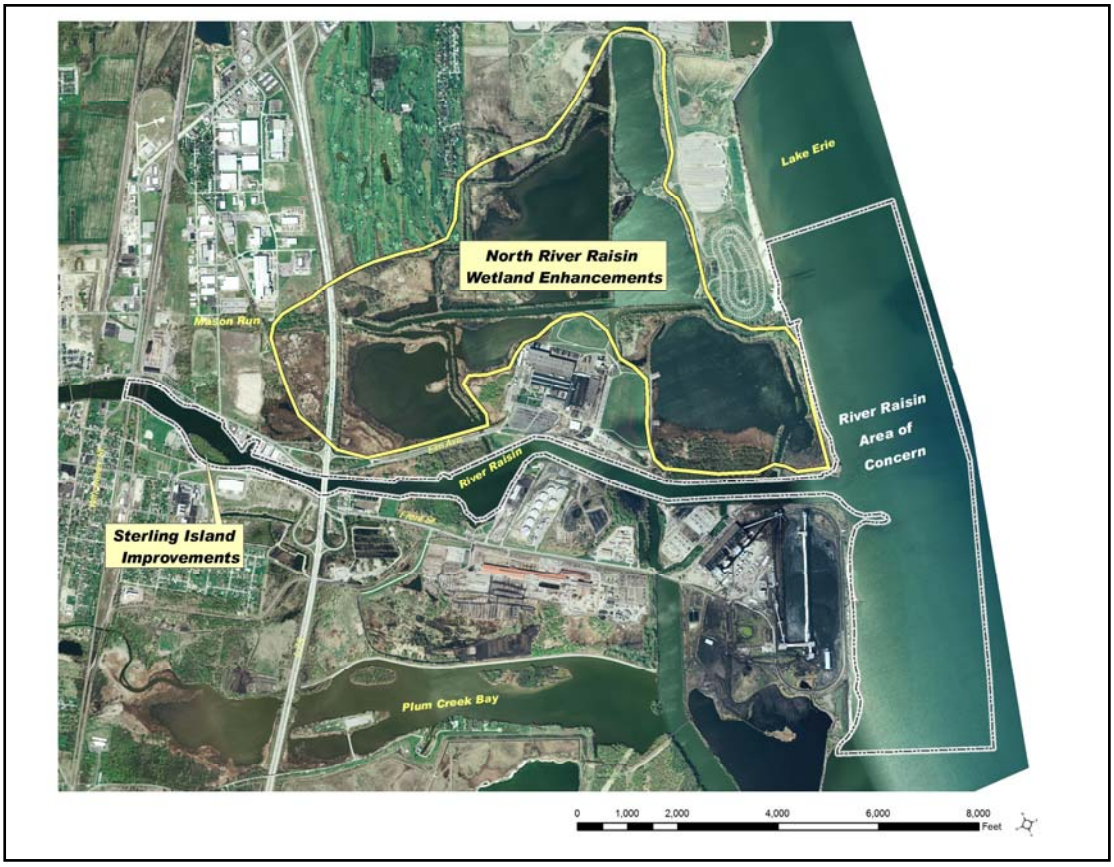


Figure 7-1: Project Locations

In addition, the Technical Committee was able to identify a number of opportunities for habitat restoration projects. The selected restoration projects, identified in this section maximize the feasible

opportunities for habitat improvement within the AOC. It is anticipated that completion of these projects will greatly improve habitat available to the fish and wildlife populations within the AOC.

Figure 7-1 identifies locations of the selected restoration projects. Additional project details are provided below.

Restoration Project 1 – North River Raisin Wetland Enhancements

This project includes two wetland areas north of the River Raisin navigation channel: the wetland complex within Wm. C. Sterling State Park (MDNR) and Eagle Island Marsh which is owned by Automotive Components Holdings (ACH) and is managed by the U.S. Fish and Wildlife Service as a unit of the Detroit River International Wildlife Refuge. Large portions of these wetland systems are covered with invasive species including *Phragmites* and purple loosestrife. The invasive species limit available habitat and species diversity. Currently, it is not apparent that fish are fully utilizing the shallow water that is available within these wetland systems for spawning and nursery habitat. Repairs and modifications to the existing dike systems and/or installation of new dikes, along with water flow control structures, would provide a mechanism to control the invasive species and allow resource managers an opportunity to restore valuable shallow water habitat. The dike systems and flow control devices should be properly designed to facilitate fish passage directly from the River Raisin to these wetland areas. An in-depth feasibility study is required to fully maximize the benefits of this project to fish and wildlife that live or stopover in the AOC and the publicly held lands. Additional project details are summarized below.

- Timetable: It is anticipated that an in-depth feasibility study (including field investigations) could take approximately one year, design and construction of improvements could take an additional two years.

- Funding: It is difficult to estimate total project costs without results of a feasibility study for this area. However, $200,000 could be used for conceptual budgeting purposes. Potential funding sources may include: U.S. EPA, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Habitat Restoration Program, among others.

- Responsible Entities: The River Raisin PAC will work to find a sponsor for this project. In addition to the PAC, other potential project stakeholders may include: the USFWS and the MDNR.

- Indicators & Monitoring: A detailed feasibility study will further clarify the scope of this project and identify specific indicators for success based on the selected improvements. AOC-wide monitoring of fish communities may be sufficient for monitoring fish species that are expected to utilize the shallow water habitat for spawning and nursing.

- Public Involvement: State and federal agencies often solicit public input during the permitting, planning, and/or implementation phases of projects. Educational signage detailing the project could be installed within Sterling State Park to increase public awareness. Additionally, volunteers could be utilized during the construction phase of the project for removal of invasive species and any potential restoration planting.

### Restoration Project 2 – Sterling Island Improvements

Sterling Island is a man-made island within the River Raisin, near the upstream boundary of the AOC. Shoreline stabilization is desired to alleviate the erosion problems. The erosion is causing downstream sedimentation, which may be impairing the benthic community and limiting the amount of forage available to other aquatic species. Soft shore stabilization techniques will reduce the sediment load to the river and provide valuable shallow water habitat in the river proper for aquatic species and waterfowl.

- Timetable: It is anticipated that the design and construction of improvements could take approximately two years.

- Funding: Although the specific scope of the project has not been identified, $200,000 could be used for conceptual budgeting purposes. Potential funding sources may include: U.S. EPA, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Habitat Restoration Program, among others.

- Responsible Entities: The River Raisin PAC will work to find a sponsor for this project. In addition to the PAC, other potential project stakeholders may include: the USFWS, the MDNR, and the city of Monroe.

- Indicators & Monitoring: The shoreline vegetation should be monitored for a period of two years to ensure sufficient growth. AOC-wide monitoring of fish communities may be sufficient for monitoring the project's success in providing additional shallow water habitat for aquatic species.

- Public Involvement: State and federal agencies often solicit public input during the permitting, planning, and/or implementation phases of projects. Volunteers could be used for planting activities.

### Restoration Project 3 – Low Head Dam Improvements (not pictured)

The existing low head dams in the River Raisin limit passage of certain fish and other aquatic species, thus eliminating access to valuable upstream and/or downstream habitat. Removal of one or more of the most downstream dams would especially provide significant benefit to channel catfish, walleye, smallmouth bass, and other migratory fish that are unable to jump over the dams. Periodic or permanent lowering of the dams or addition of functional fish passage structures could also significantly benefit fish populations if full removal is undesirable or unfeasible. A detailed feasibility study is required to fully quantify the impacts of dam removal, modification, and/or lowering.

- Timetable: It is anticipated that an in-depth feasibility study would take approximately two years or more to complete. Design and construction of improvements could take an additional two years.

- Funding: It is difficult to estimate total project costs without results of a feasibility study for this area. However, $100,000 could be used for conceptual budgeting purposes. Potential funding sources may include: U.S. EPA, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Habitat Restoration Program, among others.

- Responsible Entities: The River Raisin PAC will work to find a sponsor for this project. The city of Monroe owns the lower head dams and would likely be an important partner for this project.

- Indicators & Monitoring: A detailed feasibility study will further clarify the scope of this project and identify specific indicators for success based on the selected improvements. AOC-wide monitoring of fish communities and/or other fishery assessments may be sufficient for monitoring the project's success in providing additional access to habitat upstream of the dams.

- Public Involvement: Public input during the feasibility study phase of this project is appropriate. State and federal agencies often solicit public input during the permitting, planning, and/or implementation phases of projects.

Restoration Project 4 – River Raisin AOC Aquatic Habitat Evaluation (not pictured)

Some valuable aquatic habitat exists on private properties within and immediately adjacent to the AOC, some of which may become threatened by development. It is desirable to protect the remaining valuable habitat within and immediately adjacent to the AOC where feasible. The goal of this project is to identify, evaluate, and prioritize the remaining aquatic habitat within and immediately adjacent to the AOC for preservation through land acquisition, conservation easements, development agreements, or other mechanisms. Properties or portions of properties identified as existing aquatic habitat will be ranked as low, medium or high priorities for habitat protection. Project stakeholders will need to identify a comprehensive list of scoring criteria, but it is important that land ownership and existing and future land uses be considered. The final rankings will be the result of a detailed cost/benefit analysis that includes economic and ecological considerations that will include current value of the in-place infrastructure investments already made. The study will also detail a range of options available to the PAC for pursuing protection of the highly ranked habitats within the AOC.

- Timetable: It is anticipated that a study to identify the existing valuable habitat within the AOC could take up to a year.

- Funding: The habitat evaluation study may cost approximately $250,000. Potential funding sources may include: U.S. EPA, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Habitat Restoration Program, among others.

- Responsible Entities: The River Raisin PAC will work to find a partner(s) for this project.

- Indicators & Monitoring: No site-specific monitoring would be required for this project.

- Public Involvement: Public input may be appropriate through one or more public input meetings.

## 8.0 COMPONENT F: REPORTING ON IMPLEMENTATION OF HABITAT AND POPULATION RESTORATION PROJECTS

The River Raisin PAC will take an active role in reporting any activities related to significant fish and wildlife restoration efforts. All progress on associated targets will be reported to MDEQ via the PAC support staff or PAC chair. Progress reports will be periodically developed in written form and will also be discussed with the River Raisin AOC coordinator from the MDEQ.

## 9.0 REFERENCES

Cieniawski, Scott and Demaree Collier. Post-Remediation Sediment Sampling on the River Raisin Near Monroe, Michigan Final Results from 2001-2002 Survey: PCB Bioaccumulation Results. U.S. Environmental Protection Agency Great Lakes National Program Office. Chicago: Illinois, 2003.

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

Dodge, Kenneth. River Raisin Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report 23. Ann Arbor: Michigan, 1998.

JFNew. 2008 River Raisin Watershed Management Plan Update, 2008.

MACTEC Inc. Draft Remedial Alternatives Evaluation Report Addendum River Raisin 307 Site, 2003.

Michigan Department of Environmental Quality. Guidance for Delisting Michigan's Great Lakes Areas of Concern. Lansing: Michigan, 2006.

Michigan Department of Environmental Quality. Remedial Action Plan for River Raisin. Lansing: Michigan, 1987.

Michigan Department of Environmental Quality. Biennial Remedial Action Plan Update for the River Raisin Area of Concern, 2006.

Michigan Department of Natural Resources. Proposed drawdown of the River Raisin. DEQ File No. 08-58-0004-P. Interoffice Communication dated May 2, 2008, from G. Towns (MDNR, Fisheries Division, Lake Erie Management Unit) and J. Rathbun (MDEQ, Water Bureau-NPS Unit) to L. Sargent (MDNR, Wildlife Division), 2008.

Ohio Environmental Protection Agency. Delisting Targets for Ohio Areas of Concern. Ashtabala River, Black River, Cuyahoga River, Maumee River. Draft, May 2005.

Statewide PAC for Michigan Areas of Concern Program. Frequently Asked Questions About Michigan's Great Lakes Area of Concern Program. Available on the web at: http://www.glc.org/spac/pdf/faq.pdf, 2004.

U.S. Environmental Protection Agency. Post-Remediation Sediment Sampling on the River Raisin Near Monroe, Michigan. Final Results from 2001-2002 Survey: PCB Chemistry, Caged Fished and Bioaccumulation Results. http://www.epa.gov/glnpo/sediment/raisin/index.html, 2003.