Black River
Remedial Action Plan
Stage 2 Report

Remedial Strategies
For
Area of Concern Restoration

Black River RAP Coordinating Committee
9880 South Murray Ridge Road
Elyria, OH 44035
On behalf of the Black River Remedial Action Plan Coordinating Committee and all other local stakeholders involved in the restoration of the Black River watershed AOC, I am pleased to submit this Black River Stage 2 Report, Remedial Strategies for Area of Concern Restoration and Protection. The Black River RAP Coordinating Committee believes that the completion of all restoration and protection strategies described in this report will result in both the removal of all beneficial uses in the Black River AOC.

This Black River Stage 2 Report has been reviewed and approved by the Black River Remedial Action Plan Coordinating Committee but the Committee understands that Ohio EPA, who is charged with the development and implementation of Remedial Action Plans for Ohio’s Area of Concern, is in the process of revising Ohio’s Delisting Targets for Ohio’s Areas of Concern. The Black River Stage 2 Report is designed to restore the Black River AOC according to guidelines and targets described in both the Restoring United States Areas of Concern guidance document, adopted by the United States Policy Committee in 2001, and Ohio’s AOC guidance document.

Revisions to Ohio’s guidance document may necessitate revisions to any Ohio AOC Stage 2 Reports and the Coordinating Committee reserves the right to revise this Black River Stage 2 Report should the Committee determine the need to do so.

Ken Pearce, Chair
Black River RAP Coordinating Committee
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- Lower Black River Ecological Restoration Master Plan Appendix 3
THE REMEDIAL ACTION PLAN PROCESS

Great Lakes Areas of Concern (AOCs) are severely degraded water systems within the Great Lakes Basin and were designated by Annex 2 of the 1987 Protocol of the Great Lakes Water Quality Agreement. The 1987 Protocol defined AOCs as "geographic areas that fail to meet the general or specific objectives of the agreement where such failure has caused or is likely to cause impairment of beneficial use of the area's ability to support aquatic life." Fourteen beneficial uses were designated:

<table>
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<th>Use Impairment</th>
<th>No.</th>
<th>Use Impairment</th>
</tr>
</thead>
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<td>Beach Closings</td>
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<td>13</td>
<td>Degradation to Phytoplankton or Zooplankton Populations</td>
<td>14</td>
<td>Loss of Fish and Wildlife Habitat</td>
</tr>
</tbody>
</table>

Forty-three areas in the Great Lakes basin were identified as AOCs; 26 wholly in the United States, 17 wholly in Canada and five shared between the two countries. In addition to identifying these areas, the 1987 Protocol directed Canada and the United States, with cooperation from state and provincial governments, to develop and implement remedial action plans (RAP) specific for each AOC and designed to restore and protect any beneficial uses that were determined to be impaired.

Each RAP should undertake an ecosystem approach but because each AOC would have different or varying degrees of ecological impacts, individual RAP approaches would be unique in restoring beneficial uses. The remedial action plan process was originally designed to be a three staged process. Stage 1 consists of defining the problems within the Area of Concern and identifying the cause and sources of the environmental degradation. These components are to be compiled in a Stage 1 Report and the Black River RAP Coordinating Committee published their Stage 1 report in 1991. Stage 2 consists of outlining the strategies that will be used to remediate the causes and sources of environmental degradation and lead to the restoration of listed use impairments, and defining the criteria that will be used to measure progress. These components are to be compiled in a Stage 2 Report. The Stage 2 Report is to serve as a guide for remediation efforts in the AOC. This document is to serve as an update to the Black River RAP Stage 2 Report. Stage 3 consists of documenting evidence of the progress made in restoring the beneficial uses and ultimately, as the instrument for the delisting of an AOC.

As the Great Lakes RAP programs progressed, questions arose regarding how and when formal delisting of AOCs could occur. Delisting an impairment or AOC needs to incorporate criteria that is rigorous, defensible and allows for review and comment by interested stakeholders. In 2001, a Delisting Guidelines and Principles document was adopted by the United States Policy Committee that included an incremental delisting approach to better measure and to celebrate incremental progress by the RAP organizations.
In Ohio, four Lake Erie tributary river systems were designated Areas of Concern and Ohio EPA took the lead in developing remedial action plans for each system. Each of Ohio’s RAPs are organized differently, depending upon the unique characteristics of each AOC, including degree and sources of environmental degradation, available resources (both technical and financial), political climate, public interest and the available volunteer base. In 2005 (updated in 2008), Ohio EPA developed a RAP guidance document, *Delisting Targets for Ohio Areas of Concern*, that included restoration milestones and minimum delisting targets based upon State of Ohio regulations and policies.

Although the Black River RAP Coordinating Committee adopted the original guidance document in 2005 and the updated document in 2008, the Committee understands that delisting criteria that is more specific to the problems of the AOC can be developed and adopted, pending approval by Ohio EPA and GLNPO.

**THE BLACK RIVER ECOSYSTEM**

**Characteristics of the Area of Concern**

Due to locally severe ecological degradation, only the lower six miles of the Black River main stem were originally designated as the Area of Concern. During the formation of the RAP Coordinating Committee, members decided to expand the boundaries of the AOC to include the entire Black River watershed. At the time, it was determined that the upstream areas contributed to the impairments of the originally designated area.

The Black River watershed AOC drains 467 square miles in Lorain, Huron, Medina, Ashland, and Cuyahoga counties in north central Ohio. The river system provides a source of drinking water for two communities (Oberlin and Wellington). Approximately 180,000 citizens reside in the watershed. In addition, the Black River is home to four State-listed endangered, threatened or special concern aquatic animal species, including the recently sighted river otter and up to twelve state-threatened and/or protected plant species.

The main stem of the Black River is approximately 15 miles in length and is formed by the confluence of the two major tributary streams, the East Branch and the West Branch and drains to Lake Erie through the Port of Lorain. The main stem drainage area is approximately 71.9 mi$^2$ of predominantly urban and industrial land with many areas nearly built out. The lower six miles of the main stem, flowing through the City of Lorain, was the originally designated Area of Concern and the designation was mainly due to a legacy of contaminated sediments, mainly polynuclear aromatic hydrocarbons (PAHs) from an old coking plant that discharged to the river.
The East Branch sub-watershed drains 215.9 mi\(^2\) of land that has been experiencing development pressures. The West Branch sub-watershed drains 175.4 mi\(^2\) of land that is predominantly agricultural and rural in nature. A third and smaller tributary system (31.6 mi\(^2\) drainage area), French Creek, joins the Black River main stem at River Mile 5.10. The French Creek sub-watershed has suffered from development pressures and was, at one time, designated by Ohio EPA as a rapidly developing watershed. This designation briefly offered some additional environmental protection through the agency’s Storm Water Program. The rapid development in the French Creek and East Branch sub-watershed is expected to continue with a new regional wastewater collection system now under construction.

The predominant land use in the AOC watershed is for agricultural enterprises (cropland and pastureland), at about 52% of the watershed. Forested areas are becoming more disconnected, but forests still account for 23% of the land use. Residential and urban developments comprise about 18% of the land use in the watershed. The southern two thirds of the watershed (roughly south of U.S. Route 20) remain predominantly rural and agricultural.

Previous Ohio EPA’s Integrated Water Quality and Assessment Reports have listed the Black River watershed as an impaired water system, requiring a Total Maximum Daily Load (TMDL) study. A TMDL study was conducted and the final Black River TMDL Report was approved by the US EPA on May 30, 2008. The TMDL report found the watershed is being impacted by runoff from urban and agricultural lands; failed, failing or under-maintained home sewage treatment systems and poor stream bank land management. The most visible threat to the watershed is occurring with the conversion of farmland, forests and streamside acreage to suburban and commercial uses. This conversion of land uses impacts the ability of the land to absorb nutrients and sediments, increases stream force during rain events and leads to erosion of stream banks.
Current Status of Beneficial Uses in the Black River AOC

Unimpaired Beneficial Uses
Of the fourteen beneficial uses listed in the Great Lakes Water Quality Agreement, parts or all of eight are either not impaired or In Recovery Phase in the Black River AOC, they are:

<table>
<thead>
<tr>
<th>Beneficial Use No.</th>
<th>Beneficial Use</th>
<th>Conditions in the Black River Area of Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Restriction on Wildlife Consumption</td>
<td>Snapping turtles are currently the only wildlife species with a consumption advisory in effect in the State of Ohio as issued by the Ohio Department of Health. Snapping turtles from the Black River main stem have a one meal per week advisory for mercury which is similar to the statewide blanket advisory for fish and not considered impaired by the State or the Black River RAP Coordinating Committee.</td>
</tr>
<tr>
<td>2</td>
<td>Tainting of Fish and Wildlife Flavor</td>
<td>The Black River RAP originally listed tainting as “Unknown but impairment not suspected.” A survey conducted in 2006 by the University of Toledo for Ohio EPA, confirmed that tainting is not impaired in any Ohio AOC.</td>
</tr>
<tr>
<td>3</td>
<td>Degradation of Wildlife Populations</td>
<td>Great blue heron, bald eagle, osprey, mink, and river otter are the top-level fish eating predatory animals of the Lake Erie watershed and are good indicators of ecosystem health. Population studies of these birds and mammals indicate that their numbers are increasing, due to successful reintroduction efforts and declining levels of pollution.</td>
</tr>
<tr>
<td>4</td>
<td>Fish Tumors and other Deformities</td>
<td>Impairment was re-designated to In Recovery Phase in 2004</td>
</tr>
<tr>
<td>5</td>
<td>Bird or Animal Deformities or Reproductive Problems</td>
<td>No reports of wildlife population deformities or reproductive problems from wildlife officials resulting from contaminants within the AOC.</td>
</tr>
<tr>
<td>9</td>
<td>Restrictions on Drinking Water Consumption. Or Taste and Odor problems</td>
<td>As source waters are drawn from surface water systems, temporal or seasonal problems may cause a public water purveyor to issue boil alerts or to experience occasional taste or odor problems, no chronic problems exist for any public water purveyor in the Black River AOC.</td>
</tr>
<tr>
<td>10</td>
<td>Added Costs to Agriculture or Industry</td>
<td>No additional costs (due to human activities within the AOC) are necessary to treat water from the AOC prior to agricultural, commercial or industrial use.</td>
</tr>
<tr>
<td>13</td>
<td>Degradation of Phytoplankton and Zooplankton Populations</td>
<td>Ohio EPA and the Black River RAP Coordinating Committee consider this BUI to be related to lotic rather than lentic systems and consider this beneficial use to be not applicable to Ohio AOCs.</td>
</tr>
</tbody>
</table>
Impaired Beneficial Uses
Parts or all of eight beneficial uses are considered to be impaired in the Black River AOC. They are the focus of this Stage 2 document. The impaired beneficial uses, rationale for impairment, conditions and causes of impairment are:

<table>
<thead>
<tr>
<th>BUI #1</th>
<th>Restriction on Fish Consumption Use Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Causes of Impairment for Fish Consumption, by Location:</td>
</tr>
<tr>
<td></td>
<td>- Main stem</td>
</tr>
<tr>
<td></td>
<td>- Mercury and PCBs</td>
</tr>
<tr>
<td></td>
<td>- West Branch, East Branch and Findley Lake</td>
</tr>
<tr>
<td></td>
<td>- Mercury</td>
</tr>
<tr>
<td></td>
<td>Note: A general state-wide restriction has been issued advising not to eat more than one meal per week of fish caught from any waters in Ohio due to widespread low levels of mercury. Since all Ohio waters carry this advisory, a more stringent advisory is necessary for AOC impairment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUI #3</th>
<th>Degradation of Fish Populations Use Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Causes of Impairment of Fish Populations, by Location:</td>
</tr>
<tr>
<td></td>
<td>- Main Stem</td>
</tr>
<tr>
<td></td>
<td>- Low dissolved oxygen due to maintained depth of ship channel and sediment oxygen demand</td>
</tr>
<tr>
<td></td>
<td>- Lack of high quality in-stream habitat</td>
</tr>
<tr>
<td></td>
<td>- Embeddedness / high suspended solid load from upstream areas</td>
</tr>
<tr>
<td></td>
<td>- French Creek</td>
</tr>
<tr>
<td></td>
<td>- Suburbanization and infringement upon riparian corridor affect high quality habitats</td>
</tr>
<tr>
<td></td>
<td>- Low flow conditions due to flat terrain</td>
</tr>
<tr>
<td></td>
<td>- East Branch – The East Branch sub-watershed currently meets delisting criteria for Fish Populations</td>
</tr>
<tr>
<td></td>
<td>- West Branch</td>
</tr>
<tr>
<td></td>
<td>- While fish habitat, as measured by QHEI, appears to be adequate, fish communities in the West Branch sub-watershed do not meet state or AOC delisting criteria.</td>
</tr>
</tbody>
</table>
### BUI #6

#### Degradation of Benthos

**Causes of Benthos Impairment, by Location:**

- **Main Stem**
  - Loss of habitat
  - Embeddedness/High suspended solids

- **French Creek**
  - Due to very limited data, determining cause of impairment is difficult but suspected as being high sediment/silt loads

- **West Branch**
  - Due to very limited data, determining cause of impairment is difficult but suspected as being high sediment/silt loads

### BUI #7

#### Restrictions on Dredging Activities

**Causes of Impairment for Dredging Activities, by Location:**

- **Main stem**
  - Sediments contaminated with PAH and metals.
### BUI #8

#### Eutrophication or Undesirable Algae

<table>
<thead>
<tr>
<th>Causes of Eutrophic Impairment by Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- <strong>Main Stem</strong></td>
</tr>
<tr>
<td>- Low dissolved oxygen due to maintained depth of ship channel and sediment oxygen demand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Causes of Algal Impairment by Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- <strong>Findley Lake</strong></td>
</tr>
<tr>
<td>- Excess nutrient loads from ODNR-Findley Lake waste water treatment plant</td>
</tr>
<tr>
<td>- <strong>East Branch</strong>, downstream of Grafton WWTP</td>
</tr>
<tr>
<td>- Upgrade to Grafton WWTP removed nutrient loading and nuisance algae problem improved.</td>
</tr>
<tr>
<td>- <strong>Brentwood Lake</strong></td>
</tr>
<tr>
<td>- The dam at Brentwood Lake was removed in 2009 and the impoundment no longer exists, so the impaired conditions no longer exist at this site</td>
</tr>
</tbody>
</table>

### BUI #10

#### Beach Closings (Recreational Use)

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<th>Causes of Impairment for Recreational Use, by Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- <strong>Lake Erie Beaches</strong></td>
</tr>
<tr>
<td>- Although the two Lake Erie beaches within the AOC do not meet delisting criteria due to bacterial contamination, no link to a source within the AOC has been identified. At these beaches, waterfowl is suspected as a major source of bacteria</td>
</tr>
<tr>
<td>- <strong>Rivers and Streams</strong></td>
</tr>
<tr>
<td>- High coliform bacteria counts due to failing and under-maintained home sewage treatment systems, combined sewer overflows, livestock operations and other non-point sources</td>
</tr>
</tbody>
</table>

**Notes:**

- In 2004, Ohio Department of Health removed a contact advisory that was due to chemical contamination, in the Black River Main stem.
- In the 2010 Integrated Report, Ohio EPA found bacteria levels in the Black River Main stem meets state water quality criteria and removed the state impaired recreational use status.
**Degradation of Aesthetics**

**Causes of Impairment for Aesthetics, throughout the AOC:**
- Nonpoint Source (NPS) loadings of sediment and nutrients from agricultural and developing lands affect aquatic life, smother aquatic habitat sites
- Discharges from failed, failing and under-maintained HSTS systems affect aquatic life and could cause public nuisances
- Litter and trash accumulating along waterways

**Loss of Fish and Wildlife Habitat**

**Causes of Impairment for Fish Habitat, by Location:**
- **Lower Main Stem (from River Mile 6.2 to river mouth at Lake Erie)**
  - Lack of high quality habitat
- **Upper Main Stem (from River Mile 6.2 to confluence with East and West Branches in Elyria)**
  - Although fish population studies show the fish communities to be impaired, in-stream habitat shows fish habitat scores meet criteria.
- **French Creek**
  - The reach from the mouth to the Stony Ridge (Rt. 611) bridge meets delisting criteria.
  - Areas upstream of the Stony Ridge Bridge do not meet delisting criteria.
- **East Branch**
  - The East Branch sub-watershed currently meets delisting criteria for fish habitat.
- **West Branch**
  - Although the West Branch sub-watershed meets delisting criteria for fish habitat, fish populations fail to meet applicable criteria.
Causes of Impairment for Wildlife Habitat, by Location:
The Black River Watershed AOC, as a predominantly agricultural watershed, does not meet the Ohio delisting goals.

### RAP GOALS AND EVALUATION CRITERIA FOR IMPAIRED BENEFICIAL USES

As stated earlier, the Black River RAP Coordinating Committee has adopted the Ohio guidance, *Delisting Targets for Ohio Areas of Concern*. The delisting criteria for impaired beneficial uses are outlined below:

<table>
<thead>
<tr>
<th>Beneficial Use Impairment</th>
<th>Delisting Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Restriction on Fish Consumption</strong></td>
<td>No fish consumption advisories of one meal per month (or more stringent) have been issued by the Ohio Department of Health that can be attributed to sources within the AOC.</td>
</tr>
<tr>
<td><strong>Degradation of Fish Populations</strong></td>
<td>Index of Biotic Integrity (IBI) and Modified Index of Well Being (MIwb) values do not significantly diverge from state applicable ecoregional biological criteria. For lacustuaries and nearshore areas, IBI and MIwb values do not significantly diverge from guidelines.</td>
</tr>
<tr>
<td><strong>Fish Tumors and other deformities</strong></td>
<td>DELT levels in fish do not exceed 0.5%, and where brown bullheads are present, low tumor prevalence is documented in brown bullhead age three years and older over a series of years.</td>
</tr>
<tr>
<td><strong>Degradation of Benthos</strong></td>
<td>Invertebrate Community Index (ICI) values do not significantly diverge from state biological criteria in designated segments or sub-watersheds of the AOC. For lacustuaries, ICI should not significantly diverge from guidelines.</td>
</tr>
<tr>
<td><strong>Restrictions on Dredging Activities</strong></td>
<td>There are no restrictions on navigational dredging or disposal activities due to contaminants in sediment.</td>
</tr>
<tr>
<td><strong>Eutrophication or Undesirable Algae</strong></td>
<td>When waters meet the minimum dissolved oxygen criteria listed in the Ohio Water Quality Standards (WQS)</td>
</tr>
<tr>
<td></td>
<td>Undesirable Algae</td>
</tr>
<tr>
<td></td>
<td>No nuisance growths of algae, such as filamentous <em>Cladophora</em>, or blooms of blue-green algae exist. There are no nuisance growths of aquatic weeds that may be hindering recreational use or contact with the water body.</td>
</tr>
</tbody>
</table>
| **Beach Closings (Recreational Use)** | For bathing waters (in the AOC: Lake Erie beaches and Findley Lake State Park beach), no more than 10 posted advisory days, due to high bacteria levels, per year for five consecutive years. For primary contact recreation (water depth allows for full body immersion), for stream segments designated as such in the Ohio WQS, the 75th percentile of all samples collected in one year does not exceed 1000 per 100 ml fecal coliform or the 90th percentile does not exceed 2000 per 100ml fecal coliform or *For E.coli*, the 75th percentile does not exceed 126 per 100ml or the 90th percentile does not exceed 298 per 100ml. This standard must be met for five consecutive years. For secondary contact recreation (wading waters, water depth precludes full body immersion), for streams designated as such in the Ohio WQS, the 90th percentile of samples collected over a five year period does not exceed 5000 per 100ml fecal coliform or 576 per 100ml *E. coli*.
| **Degradation of Aesthetics** | The general surface water quality shall meet the criteria outlined in Ohio Administrative Code Section 3745-1-04 to the extent practical and possible. This section is summarized as: (A) Free from suspended solids or other substances that enter the waters as a result of human activity and that will settle to form putrescent or otherwise objectionable sludge deposits, or that will adversely affect aquatic life; (B) Free from floating debris, oil, scum and other floating materials entering the waters as a result of... |
Loss of Fish and Wildlife Habitat

Fish Habitat

For main stem and tributaries, habitat quality shall average a QHEI score of 60 or better throughout the free-flowing stream stretches of the AOC.

For nearshore, harbor or lacustuary areas, Lake Erie QHEI results do not indicate any impairment, and Ohio Aquatic Life Water Quality Standards are met.

Wildlife Habitat

Forest buffers exist on 50% of residential tributaries and 25% of urban tributaries and for headwater streams, HHEI habitat quality shall average a score of 30 for warm water streams and 70 for cold water streams.

For headwater streams and wetlands, State Aquatic Life Water Quality Standards are met. Wildlife officials do not identify loss of or poor quality habitat as cause for non-attainment with wildlife goals.

Note: The Black River watershed AOC is predominantly an agricultural watershed. The Black River RAP Coordinating Committee has held discussions that the Ohio delisting guidance for Wildlife Habitat is unattainable for any predominantly agricultural watershed and is currently seeking assistance to develop new delisting goals and milestones.

AOC PROGRAMMATIC STRATEGIES

The Black River RAP Coordinating Committee has the identified strategies within the Great Lakes RAP program that affects the assessment of specific beneficial uses in the Black River AOC, the Committee’s ability to celebrate incremental improvements or even the ability of the Black River Watershed AOC to meet delisting milestones and targets. These strategies include improvements documented to the Restriction on Dredging Activities beneficial use, possible delisting of Fish Habitat and Population beneficial uses within a sub-watershed and a revision of targets and milestones for Wildlife Habitat.

In Recovery Phase Re-designation for Dredging and Disposal Impairment

<table>
<thead>
<tr>
<th>Cost: $1000</th>
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</thead>
<tbody>
<tr>
<td>To develop outreach materials and hold a public meeting</td>
</tr>
</tbody>
</table>

In 2009, The Black River RAP Coordinating Committee developed a draft application for re-designation of the Restrictions on Dredging and Disposal Activities BUI from Impaired to In Recovery Phase. In the draft application, the Committee outlined the documented recovery to date.

The Committee submitted the draft application to GLNPO for preliminary review and comment. As yet, the Committee has received no return comments from GLNPO. Should a re-designation of this beneficial use be approved, a public meeting will be held by the Black River RAP to announce and celebrate the re-designation.
Delisting Use Impairments that Meet Applicable Delisting Criteria

The East Branch sub-watershed, which comprises approximately half of the Black River AOC, meets current delisting criteria for both Fish Habitat and Fish populations. An application for the delisting may be developed and sent to GLNPO for review and comment after the RAP Coordinating Committee receives comments on and finalizes the draft application for re-designation of the Dredging Impairment.

Revision of Wildlife Habitat Delisting Goals and Targets

When the Ohio RAP Coordinators developed the guidance document, Delisting Targets for Ohio’s Areas of Concern, they used wildlife habitat parameters that were developed by Environment Canada for Canadian AOCs as targets and milestones for Wildlife Habitat. Recently, the Black River RAP Coordinating Committee assessed the Ohio AOC guidance milestones and targets against conditions in the Black River and other Ohio AOCs and determined that meeting the current wildlife habitat criteria is impractical for the Black River AOC or any predominantly agricultural watershed. Of the four AOCs in Ohio, only the Black River and Maumee River AOCs (both predominantly agricultural watersheds) list Loss of Wildlife Habitat as impaired.

The Black River RAP Coordinating Committee has determined that meeting current Ohio delisting milestones and targets is both impractical and cost prohibitive. The RAP Committee has determined that it needs more reasonable delisting criteria for this beneficial use and has expressed this to Ohio EPA. Ohio EPA has promised to look at this when the state delisting guidance is rewritten.

Ohio EPA plans to re-write the AOC guidance document in 2012. The Black River RAP Coordinating Committee will review the new guidance document but will reserve the right to address this problem by developing its own applicable targets and milestones if the Committee determines that the new Wildlife Habitat delisting guidance is impractical.
## COMPLETED RESTORATION AND PROTECTION STRATEGIES

<table>
<thead>
<tr>
<th>Activity</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedial Navigation Channel Dredging</td>
<td>Restrictions on Dredging and Disposal Activities, Fish Tumors and Other Deformities, Degradation of Fish Habitat, Restriction on Fish Consumption, Recreational Use (Beach Closings)</td>
</tr>
</tbody>
</table>

Between 1989 and 1990, prior to the development of the Black River RAP and under a Consent Decree with US EPA, sediments contaminated with PAHs were dredged from the river and placed in a specially designed facility. The PAH contaminants were associated with the high incidence of external and liver tumors in the fish populations. Prior to the dredging, fish tumor incidence had declined but rebounded shortly after the dredging operation before dropping again significantly. This increase was anticipated.

**Note:** The Black River RAP Coordinating Committee considers the Army Corps routine maintenance dredging of the Federal Ship Channel to be on-going remediation of the contaminated sediment problem.

**Impact Noted on Use Impairments:**
Since the remedial dredging, the incidence of fish tumors declined dramatically allowing the Black River RAP Coordinating Committee to re-designate the fish tumor use impairment from Impaired to In Recovery Phase in 2004. It also allowed the Ohio Department of Health to remove the contact advisory due to chemical contaminants in the lower Black River. Over time, improvements in sediment quality and fish habitat have been documented. The RAP Coordinating Committee is applying to re-designate the Dredging and Disposal Activities beneficial use from Impaired to In Recovery Phase.

<table>
<thead>
<tr>
<th>Lorain Port Authority Fish Habitat Shelf</th>
<th>Degradation of Fish Habitat, Degradation of Fish Populations, Degradation of Benthos</th>
</tr>
</thead>
</table>

Through Section 401 mitigation funds and funding made available from US EPA, approximately 800 feet of underwater habitat shelf was constructed on the main stem at the Port Authority’s Black River Landing Site. Almost immediately, the shelf was successful in raising fish habitat and fish population matrix scores from non-attainment to attainment of state water quality criteria.

**Impact Noted on Use Impairments:**
This site now meets delisting criteria for both fish habitat and fish populations and the shelf design has been copied in other areas of the Black River main stem as well as by other AOCs. To date, comprehensive studies related to benthic community health have not been undertaken.

<table>
<thead>
<tr>
<th>Lodi Area Restoration</th>
<th>Degradation of Fish Habitat, Degradation of Fish Populations, Degradation of Benthos</th>
</tr>
</thead>
</table>

Through funding available through mitigation and the State of Ohio Water Resource Restoration Sponsorship Program, habitat and stream bank improvements were made to the East and West Forks. The improvements included:
- Re-sloping stream banks and raising stream beds, through a series of weir structures, to allow previously channelized streams to reconnect to their flood plain,
- Removing snags and using bio-engineering techniques to protect eroding stream banks,
- Establishment of protected upland habitat, especially riparian corridors.
**Impact Noted on Use Impairments:**
This restoration effort was successful in providing riparian corridors and improving fish habitat and fish and benthic community health. Both the East and West Fork areas now meet state attainment for water and habitat quality and meet delisting criteria for fish habitat and populations.

<table>
<thead>
<tr>
<th>Brentwood Lake Dam Removal</th>
<th>Eutrophication/Undesirable Algae Degradation of Aesthetics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upgrade to Grafton WWTP</strong></td>
<td></td>
</tr>
<tr>
<td>The East Branch of the Black River, downstream of the Grafton Treatment Plant, Findley Lake and Brentwood Lake were three areas in the Black River identified by the Coordinating Committee as impaired for undesirable algae blooms.</td>
<td></td>
</tr>
<tr>
<td><strong>Impact Noted on Use Impairments:</strong></td>
<td></td>
</tr>
<tr>
<td>The removal of the dam at the Brentwood Lake development removed the impoundment, restored the stream flow through the area and removed the algal bloom problem.</td>
<td></td>
</tr>
<tr>
<td>An upgrade to the Grafton Treatment Plant, including phosphorus reduction, removed the chronic algae bloom problem in the downstream reach of the East Branch.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Riparian Corridor Resolution</th>
<th>Degradation of Fish and Wildlife Habitat Degradation of Benthos Degradation of Fish Populations Degradation of Aesthetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>In 1996, the Black River Stream Riparian Corridor Restoration Task Force of the Black River RAP Coordinating Committee developed a Riparian Corridor Resolution that promised that the Black River RAP and watershed stakeholders would jointly seek funding to develop and implement strategies that will restore, enhance and protect riparian corridors in the Black River watershed AOC.</td>
<td></td>
</tr>
<tr>
<td>Unfortunately, this resolution was largely ignored by watershed stakeholders.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase I and Phase II Assessment of 27-acre portion of RTI Coke Plant parcel</th>
<th>Degradation of Fish and Wildlife Habitat Degradation of Benthos Degradation of Fish Populations Degradation of Aesthetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>The City of Lorain completed Phase I and Phase II assessment of 27-acre portion of the Coke Plant parcel intended to be developed into the City’s future WWTP. The assessments are necessary to determine what type of site remediation activities might be necessary.</td>
<td></td>
</tr>
</tbody>
</table>
PROPOSED AND ON-GOING RESTORATION AND PROTECTION STRATEGIES FOR REMAINING USE IMPAIRMENTS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
</table>
| Total Maximum Daily Load (TMDL)  | Report –Completed Actions-Ongoing | Degradation of Fish Habitat  
Degradation of Fish Populations  
Degradation of Benthos  
Degradation of Aesthetics  
Eutrophication or Undesirable Algae  
Beach Closings (Recreational Use) |

The Black River TMDL was approved by US EPA on August 20, 2008. Actions suggested in the TMDL include 1) Restoring stream habitat in agricultural areas, 2) Eliminate bacteria problems by reducing home sewage treatment systems failures and eliminate CSOs, 3) Reducing impacts from permitted dischargers, and 4) Better manage storm water quantity and quality in developing areas. These actions can be undertaken with the Agricultural Nonpoint Source Plan (see Appendix), Watershed Action Plans, county home sewage treatment plant programs and the elimination of CSOs and SSOs. The individual costs of these plans and programs are unknown.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
</table>
| CSO & SSO Elimination            | Ongoing | Degradation of Aesthetics  
Eutrophication and Undesirable Algae  
Beach Closings (Recreational Use) |

**Future Action Required**

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedial actions are on-going despite CSO and SSO elimination plans are either under development or not yet approved</td>
<td>Cities of Elyria and Lorain</td>
<td>Unknown</td>
<td>Remedial actions are on-going despite CSO and SSO elimination plans are either under development or not yet approved</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
</table>
| Ford Road Landfill Cleanup       | Ongoing | Restrictions on Dredging and Disposal Activities  
Degradation of Fish Habitat  
Degradation of Fish Populations |

The landfill was in operation since the early 1900s. The site was originally a ravine which has been filled to the same level as Ford Road. The landfill accepted municipal and various industrial wastes in drums and in bulk into the 1970s. The current owner of the site is the Lorain County Metropolitan Parks District. The landfill was brought to the attention of U.S. EPA in 1979. In 2009, a consent decree was signed that formalizes an agreement with EPA to conduct cleanup action at the Ford Road Landfill site. The next step in the process is to develop a plan for site cleanup and then begin work to carry out the plan.

**Future Action Required**

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Time Frame of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of landfill clean up</td>
<td>US EPA and PRPs</td>
<td>Regulatory</td>
<td>On-going</td>
</tr>
<tr>
<td>Activity</td>
<td>Status</td>
<td>Use Impairment Affected</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Maintenance Channel Dredging</td>
<td>Ongoing</td>
<td>Restrictions on Dredging and Disposal Activities, Fish Tumors and Other Deformities, Degradation of Fish Habitat, Degradation of Benthos, Restriction on Fish Consumption</td>
<td></td>
</tr>
</tbody>
</table>

The federal navigation channel begins immediately downstream of the remedial dredging activity, continues to the river mouth and includes the Outer Harbor. The US Army Corps of Engineers maintains the 27 foot depth of the federal navigation channel by periodic dredging. About 160,000 cubic yards of sediment are dredged by the Corps as necessary, typically on a two year cycle. Until recently, all dredged spoils were placed in the Confined Disposal Facility. The Black River RAP Coordinating Committee views the routine maintenance dredging by the Corps as a secondary means of removing any remaining contaminated sediments that have migrated downstream from the remedial dredged area.

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continued monitoring of sediment quality</td>
<td>USACE &amp; Ohio EPA</td>
<td>To be funded as part of regulatory requirements of each agency</td>
<td>On-Going</td>
</tr>
<tr>
<td>New Fish Tumor Study</td>
<td>Ohio EPA</td>
<td>$180,000, Funded as part of Black, Cuyahoga &amp; Maumee tumor study</td>
<td>To be conducted in 2012</td>
</tr>
<tr>
<td>New Biocriteria Study</td>
<td>Ohio EPA</td>
<td>$21,000</td>
<td>To be conducted in 2012</td>
</tr>
<tr>
<td>New Fish Tissue Study</td>
<td>Ohio EPA &amp; ODH</td>
<td>$14,000</td>
<td>Proposed for 2012 and 2014</td>
</tr>
</tbody>
</table>

As part of the Black River TMDL, Lorain and Medina Soil and Water Conservation Districts (SWCDs) and the Natural Resource Conservation Service (NRCS) developed the Agricultural Nonpoint Source Plan to:

a. Establish and protect riparian corridors,
b. Address stream bank erosion,
c. Address impacts from livestock / crop production operations and
d. Reduce impacts from stream channelization.

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of program will require funding sources to be identified and secured</td>
<td>NRCS SWCDs</td>
<td>Unknown</td>
<td>To Be Determined</td>
</tr>
</tbody>
</table>

Black River Agricultural Nonpoint Source Plan (see Appendix)

Ongoing

Degradation of Fish Habitat, Degradation of Fish Populations, Degradation of Benthos, Degradation of Aesthetics, Eutrophication or Undesirable Algae, Beach Closings (Recreational Use)

As part of the Black River TMDL, Lorain and Medina Soil and Water Conservation Districts (SWCDs) and the Natural Resource Conservation Service (NRCS) developed the Agricultural Nonpoint Source Plan to:

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<tbody>
<tr>
<td>Implementation of program will require funding sources to be identified and secured</td>
<td>NRCS SWCDs</td>
<td>Unknown</td>
<td>To Be Determined</td>
</tr>
<tr>
<td>Activity</td>
<td>Status</td>
<td>Use Impairment Affected</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Watershed Action Plans</td>
<td>Ongoing</td>
<td>Degradation of Fish Habitat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degradation of Fish Populations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degradation of Benthos</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degradation of Aesthetics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eutrophication or Undesirable Algae</td>
<td></td>
</tr>
</tbody>
</table>

Watershed Actions Plans are in development for the French Creek and West Branch sub-basins of the Black River AOC watershed. The Black River Coordinating Committee sees the need to develop a watershed action plan for the East Branch sub-watershed. The goal of a watershed action plan is to restore and maintain the chemical, physical and biological integrity of water resources within the watershed. Because implementation of these action plans occur locally, without mandate or regulation, coordination of effort and communication among the various stakeholders is critical to the success of the plan. To facilitate the coordination and communication, sustainable funding for a watershed coordinator is essential.

| Future Action Required                                                                 |
|-------------------------------------------|------------|----------------------------------------------------------------------------------------|
| Action                                    | Responsible Entity | Funding Requirements                | Time Frame of Activity |
| Completion and implementation of          | Lorain County    | Report completion contracted with Coldwater Consulting                                 | Plan to be completed in 2011 |
| Watershed Action Plans for French Creek   |                |                                         |                          |
| and West Branch                           |                |                                         |                          |
| Secure sustainable funding for the        | To Be Determined | $120,000 per year                       | To Be Determined         |
| currently vacant Watershed Coordinator    |                |                                         |                          |
| position in Lorain County                 |                |                                         |                          |
| Completion and implementation of           | To Be Determined | Would be included in future funding of watershed coordinator                          | To Be Determined         |
| Watershed Action Plan for East Branch     |                |                                         |                          |

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elyria Greenway and Trail Master Plan</td>
<td>Plan -Completed</td>
<td>Degradation of Fish Habitat</td>
</tr>
<tr>
<td>(see Appendix)</td>
<td>Actions-Ongoing</td>
<td>Degradation of Fish Populations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degradation of Benthos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degradation of Aesthetics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eutrophication or Undesirable Algae</td>
</tr>
</tbody>
</table>

In September, 2009, the City of Elyria developed a Greenway Trail and Master Plan. The goals of the plan included:

a. Educate residents of Elyria and the county to the importance of green infrastructure practices, open space preservation and Best Management Practices (BMPs),

b. Include environmental stewardship and conservation of the natural resources.

c. Reduce air and water pollution through best management practices.

d. Help clean up the Black River and its banks which lead to a better environment for the City of Elyria residents.

| Future Action Required                                                                 |
|-------------------------------------------|------------|----------------------------------------------------------------------------------------|
| Action                                    | Responsible Entity | Funding Requirements                | Time Frame of Activity |
| Monitoring of BMP use and effectiveness   | City of Elyria    | To Be determined                       | Unknown                |
The City of Elyria and its Wastewater Treatment Plant, working in conjunction with the Delta Institute, began a countywide mercury reduction program, the Lorain County Mercury Reduction Collaboration (LCMRC), in October 2002. The LCMRC program includes working with communities in the watershed to hold mercury collection days and to survey businesses to identify and recycle sources of mercury that are no longer useful.

### Future Action Required

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Time Frame of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main stem assessment of contaminant levels in fish tissues</td>
<td>Ohio EPA and ODH</td>
<td>$7000 per year for 2 years</td>
<td>Proposed for 2012 and 2014</td>
</tr>
<tr>
<td>East Branch assessment of contaminant levels in fish tissues</td>
<td>Ohio EPA and ODH</td>
<td>$7000 per year for 2 years</td>
<td>Unknown (To be proposed in future GLRI applications)</td>
</tr>
<tr>
<td>West Branch assessment of contaminant levels in fish tissues</td>
<td>Ohio EPA and ODH</td>
<td>$7000 per year for 2 years</td>
<td>Unknown (To be proposed in future GLRI applications)</td>
</tr>
<tr>
<td>Findley Lake assessment of contaminant levels in fish tissues</td>
<td>Ohio EPA and ODH</td>
<td>$7000 per year for 2 years</td>
<td>Proposed for 2012 and 2014</td>
</tr>
</tbody>
</table>

Discharges from old, failing and under-maintained home sewage treatment systems have long been identified as causing degradation in the Black River watershed AOC. The cost of replacing a home system is a large financial burden for many home owners, especially in the current economic climate. Replacing a large number of these systems is not cost effective for many current funding opportunities. The Black River RAP has partnered with the Lorain County General Health District in outreach efforts, including the development of an educational video, but it has been estimated that a large number of systems are still under-maintained and failing.

Where concentrations of these failing systems have been identified, one alternative would be to eliminate these systems and install sanitary systems, but this also involves huge costs.

### Home Sewage Treatment System (HSTS) Elimination, Upgrade and Replacement

- Inspection and Outreach – Ongoing
- Elimination, Upgrade and Replacement - Ongoing

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Time Frame of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach</td>
<td>County Health Departments</td>
<td>Included in health department HSTS inspection program</td>
<td>On-Going</td>
</tr>
<tr>
<td>System upgrade or replacement or System elimination with sanitary sewers</td>
<td>County Health Departments</td>
<td>($5,636,400 to $75,152,000)</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
The 270-acre Former RTI Coke Works property, located on the south bank of the Black River between was acquired by the City of Lorain in 2008. The site is primarily comprised of three parcels, known as the Coke Plant, North Fill, and C&D Landfill. In 2010, the City acquired an adjacent parcel, formerly owned by US Steel, which is known as the Turning Basin parcel. In 2005, prior to the City’s acquisition of the property, a Phase I Environmental Site Assessment of the Coke Plant, North Fill and C&D Landfill parcels was completed under a Targeted Brownfield Assessment funding from Ohio EPA. A Phase I Environmental Site Assessment of the Turning Basin parcel was completed in 2007 and updated in 2009 under the City’s U.S. EPA Brownfield Assessment Grant. Both of these Phase I reports recommend that additional assessment and cleanup activities be conducted at the Former RTI Coke Works site. The next step in the process is to pursue funding for Phase II assessment and remediation and then begin work to complete site cleanup.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former RTI Coke Works Cleanup</td>
<td>Ongoing</td>
<td>Restrictions on Dredging and Disposal Activities, Degradation of Fish Habitat, Degradation of Fish Populations, Degradation of Benthos, Degradation of Aesthetics</td>
</tr>
</tbody>
</table>

Future Action Required

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Time Frame of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of various assessment and cleanup activities for areas identified in Phase I Environmental Site Assessments</td>
<td>City of Lorain</td>
<td>To Be Determined; estimated $80 million to address all Identified Areas</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Coke Plant Parcel:</td>
<td></td>
<td>Solid Waste Management Units (SWMU) #13, 14, 15, 18, 19, 20, 21</td>
<td></td>
</tr>
<tr>
<td>· Benzol, Burnt Lime, Coke and By-products Plants</td>
<td></td>
<td>Sulfate Building</td>
<td></td>
</tr>
<tr>
<td>· Oil ASTs</td>
<td></td>
<td>Sewer and Outfall</td>
<td></td>
</tr>
<tr>
<td>· Reservoir No. 1</td>
<td></td>
<td>Dynamite storage area</td>
<td></td>
</tr>
<tr>
<td>· Tar pits</td>
<td></td>
<td>Slag and stockpile areas</td>
<td></td>
</tr>
<tr>
<td>North Fill Parcel:</td>
<td></td>
<td>SWMUs #22, 23, 24, 25, 26, 27, 28, 29, 30, 32 and 33</td>
<td></td>
</tr>
<tr>
<td>· Pipe Mill Sewer Discharge</td>
<td></td>
<td>Collection Sump at RM 5.05</td>
<td></td>
</tr>
<tr>
<td>· Slag and stockpile areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C&amp;D Landfill Parcel:</td>
<td></td>
<td>SWMU #36</td>
<td></td>
</tr>
<tr>
<td>· Turning Basin Parcel</td>
<td></td>
<td>Former boat house</td>
<td></td>
</tr>
<tr>
<td>· ASTs and drums</td>
<td></td>
<td>Slag and stockpile areas</td>
<td></td>
</tr>
</tbody>
</table>
Lorain Black River WWTP Redevelopment CORF Project
(Soil remediation on 27-acre future WTTP site to address soil contaminants, including arsenic, aluminum and PAHs, at concentrations exceeding direct contact standards)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
<th>Use Impairment Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Black River Ecological Master Plan (see Appendix)</td>
<td>Plan –Completed Actions-Ongoing</td>
<td>Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos Degradation of Aesthetics Eutrophication or Undesirable Algae</td>
</tr>
</tbody>
</table>

The Lower Black River Master Plan was completed in December, 2009 and some of the remedial actions suggested in the Plan have been started by the City of Lorain. The goal of the Lower Black River Ecological Restoration Master Plan is to serve as a guide for the City of Lorain and other main stem stakeholders during re-development that improves, preserves and restores fishery health, aquatic and riparian habitat, and adjacent terrestrial habitats in a way that is consistent with the community’s vision for the area, including social and cultural interaction, recreational access and use, and development and public infrastructure.

### Future Action Required

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Entity</th>
<th>Funding Requirements</th>
<th>Time Frame of Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring of effectiveness of restoration projects</td>
<td>City of Lorain</td>
<td>Included in funding of specific projects</td>
<td>On-going</td>
</tr>
<tr>
<td>Various restoration activities listed in Master Plan</td>
<td>City of Lorain and other river stakeholders</td>
<td>Master Plan Components Note: Dollar amounts were approximated in the Plan.</td>
<td></td>
</tr>
<tr>
<td>Fish Shelves</td>
<td>$1,402,800</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Slag Pile Remediation</td>
<td>$3,211,000</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Wetland Restoration or Construction</td>
<td>$4,812,000</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Streambank Stabilization</td>
<td>$1,497,500</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Bulkhead Habitat</td>
<td>$11,844,000</td>
<td>Unknown</td>
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</tr>
<tr>
<td>Invasive Species Removal</td>
<td>$205,000</td>
<td>Unknown</td>
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<tr>
<td>Submerged Aquatic Plantings</td>
<td>$124,440</td>
<td>Unknown</td>
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<tr>
<td>Fish Baskets and Floating Wetlands</td>
<td>$305,000</td>
<td>Will not be undertaken by RAP; For Research Only</td>
<td></td>
</tr>
<tr>
<td>Project Description</td>
<td>Responsible Party</td>
<td>Funding Sources</td>
<td>Status</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------</td>
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<td>---------------------------------------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Black River Restoration ARRA Project</strong> (Removal of 1.2 million cubic yards of slag, restoration of 52.2 acres of riparian habitat, 8,200 feet of stream bank) All actions were recommended by Master Plan</td>
<td>City of Lorain</td>
<td>$6,300,000 ARRA Funds $100,000 Supplemental Enforcement Project Funds from Ohio EPA</td>
<td>On-going</td>
</tr>
<tr>
<td><strong>Lower Black River Habitat Restoration NOAA Project Phase I</strong> (construction of a 2,700 foot long fish habitat shelf and installation of fish habitat structures (i.e. root wads, boulder clusters, etc.) All actions were recommended by Master Plan)</td>
<td>City of Lorain</td>
<td>$1,697,800</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>Lower Black River Habitat Restoration NOAA Project Phase II</strong> (construction of 2,800 feet of fish habitat shelves, stabilization of 1,570 feet of stream bank, removal of 45,000 cubic yards of slag and restoration of 2 acres of riparian habitat) All actions were recommended by Master Plan</td>
<td>City of Lorain</td>
<td>$1,099,750</td>
<td>Application Submitted</td>
</tr>
<tr>
<td><strong>Lower Black River Habitat Restoration NOAA Project - Phase III</strong> (site assessment, permitting, and engineering/design for approximately 4-7 acres of riparian habitat restoration and 1,200-1,600 linear feet of stream) All actions were recommended by Master Plan</td>
<td>City of Lorain</td>
<td>$350,000</td>
<td>Application Submitted</td>
</tr>
<tr>
<td>Monitoring of biocriteria in main stem</td>
<td>Ohio EPA</td>
<td>$21,000</td>
<td>Proposed for 2011, included in 2010 GLRI application from Ohio EPA</td>
</tr>
<tr>
<td>Outreach – Develop a video on the success of the Master Plan and remedial efforts of the City of Lorain</td>
<td>Unknown</td>
<td>$25,000</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
### Plans, Studies and Assessments Needed to Ascertained Current Conditions of Remaining Use Impairments

Showing improvement in Great Lakes Areas of Concern has become increasingly more important. In order to show improvement in the RAP process, periodic assessments of conditions in the each AOC is essential. The RAP Coordinating Committee has relied on assessments periodically conducted by Ohio EPA, but due to funding and personnel availability, a comprehensive assessment of the Black River watershed has not been undertaken by Ohio EPA since 1992. In the past 18 years, many watershed conditions are likely to have changed and the Coordinating Committee needs new studies to be undertaken in order to determine the current conditions in the AOC before the Committee is able to select additional measures.

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Party</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attainment Study and development of Watershed Action Plan for the East Branch Sub-Watershed</strong></td>
<td>Attainment study – Ohio EPA</td>
<td>WAP - To Be Determined</td>
</tr>
<tr>
<td></td>
<td>WAP - To Be Determined</td>
<td><strong>Attainment Study funded in current Ohio EPA grant</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WAP - To Be Determined</td>
</tr>
</tbody>
</table>

Currently, both Fish Habitat and Fish Population data shows that the East Branch sub-watershed meets current delisting criteria but the data is aging rapidly and a new study should be undertaken to see if the delisting criteria are still being met before the RAP Coordinating Committee applies for delisting these impairments.

Locally driven watershed actions plans are being developed for the French Creek and West Branch sub-basins of the Black River AOC watershed. The RAP Committee would like to secure funding to get an action plan developed for the East Branch sub-watershed. The local watershed coordinator position has seen considerable turnover in personnel and the RAP Coordinating Committee would like to locate sustainable funding to keep this position in the watershed. Once a plan is developed for the East Branch, all upstream and tributary systems to the Black River main stem, the originally designated AOC, would be covered with a locally developed and driven watershed action plan that could protect the gains made in the basin.

<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Party</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fish Tumor Study of the Main Stem</strong></td>
<td>Black River RAP</td>
<td>$180,000 (for 3 AOCs)</td>
</tr>
<tr>
<td></td>
<td>Ohio EPA</td>
<td>2011 GLRI Ohio EPA grant</td>
</tr>
<tr>
<td></td>
<td>USGS</td>
<td></td>
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</tbody>
</table>

An update of liver tumor prevalence in bullheads is needed to ascertain progress and prove restoration of the Fish Tumors and Other Deformities BUI is planned for 2012 by Ohio EPA for the Black, Cuyahoga and Maumee AOCs. The results of this study coupled with external deformities noted when fish community studies are conducted will provide the current status of the Fish Tumors and Other deformities use impairment in the AOC.
<table>
<thead>
<tr>
<th>Action</th>
<th>Responsible Party</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Algal Study of Findley Lake</strong></td>
<td>Ohio EPA</td>
<td>$500</td>
</tr>
<tr>
<td>ODNR initiated phosphorus reduction at their Findley Lake wastewater plant. An assessment of the algal bloom problem is planned and funded to assess conditions against delisting criteria for the undesirable algae use impairment.</td>
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</table>

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<thead>
<tr>
<th>Action</th>
<th>Responsible Party</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comprehensive Study of the Main Stem, French Creek, East Branch and West Branch Sub-watersheds</strong></td>
<td>Ohio EPA (as part of Ohio Lake Erie AOC/LaMP Program Support Grant)</td>
<td>$36,000 for West Branch $25,000 for East Branch $21,000 for Main stem $17,000 for French Creek</td>
</tr>
<tr>
<td>USACE</td>
<td>To Be Determined</td>
<td></td>
</tr>
<tr>
<td>As with most of the Black River watershed AOC, biocriteria datasets are old and needs to be updated but according to the most recent available data, the East Branch sub-watershed may be attaining delisting criteria for both Fish Populations and Fish Habitat beneficial uses. In addition, the West Branch sub-watershed may be attaining delisting criteria for fish habitat. More recent biocriteria data are necessary for both sub-watersheds to confirm. In addition, the Black River RAP Coordinating Committee is negotiating with the US Army Corps of Engineers to conduct an assessment of all areas of the AOC to determine current impairment status.</td>
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</tbody>
</table>
EDUCATION PROGRAMS – ON-GOING AND COMPLETED

### Web Pages

- US EPA/GLNPO
- Ohio EPA
- Local Black River RAP

Ongoing, periodically updated

### Videos

- Early Video
- Rediscovering the Black River Video
- Your Black River Watershed (A compilation of the first two videos)
- Home Sewage Treatment System Video

Ongoing, on Black River web page (www.blackriverrap.com/multimedia)

Home Sewage Treatment Video is being used by Lorain County General Health District in their HSTS program.

Copies of the HSTS video were presented to every county health department in the Ohio Lake Erie watershed.

### Brochures

- Living Along French Creek
- Living Along the East Branch
- Living Along the West Branch

Ongoing, used at outreach events and by permitted storm water entities as part of their education/outreach requirement.

Available at: http://www.blackriverrap.com/resources

### Annual Reports

Annual reports for the last 10 years available on local Black River RAP web page

Ongoing. Available at: http://www.blackriverrap.com/resources

### Outreach Events

- Black River Day
- Lorain County Community Alliance Black River Conference
- Presentations

Scheduled as needed

### RECOMMENDATIONS FOR THE RESTORATION AND PROTECTION OF THE BLACK RIVER AOC

Several important plans to address impairments have been initiated, such as:

- Master Plans developed by the Cities of Lorain and Elyria in the Black River main stem and lower East and West Branches
- Watershed Action Plans for the French Creek and West Branch sub-basins
- Black River TMDL including the Black River Agricultural Nonpoint Source Plan

These plans will take some time to evolve into measurable actions and while these plans are evolving, the Black River RAP will look to have data for biocriteria, fish tissues and incidence of fish tumors updated around the AOC.
Biocriteria datasets (IBI, M1wb, ICI and QHEI) throughout much of the Black River AOC are old with some datasets over ten years in age and considered to be historic data by Ohio EPA. The Black River RAP Coordinating Committee finds it difficult, if not impossible, to assess the current condition of impairments in the AOC or offer actions for remediation with this aging data.

As part of their Great Lakes Restoration Initiative funding, the Black River RAP has asked Ohio EPA to conduct the following studies:
- Fish Habitat, Fish and Benthic Communities in the Black River main stem, French Creek, East and West Branch sub-basins
- Fish Tissue and algae in Findley Lake
- Fish Tumors in the Black River main stem
- Bacteria in the Upper East Branch sub-basin

Once these studies are completed, an accurate current condition of the AOC will be determined and if necessary, additional remedial actions will be offered that may necessitate updating this Stage 2 report.
REFERENCES


Ohio EPA. Ohio Water Quality Standards. Chapter 3745-1-04 of the Ohio Administrative Code (Available at: http://www.epa.state.oh.us/portals/35/rules/01-04.pdf)

Ohio EPA, 2008, Total Maximum Daily Loads for the Black River Watershed (Available at http://www.epa.state.oh.us/portals/35/tmdl/BlackRiverTMDL_final_may08_wo_app.pdf)

Ohio EPA, 2008, Delisting Targets for Ohio Areas of Concern (Available at http://www.epa.state.oh.us/portals/35/rap/DelistingTargetsOhioAOC_2008Revision.pdf)


Ohio EPA, 1993, Biological and Water Quality Study of the Black River (with selected tributaries) and Beaver Creek. Lorain, Medina, Ashland, Huron and Cuyahoga Counties, Ohio. (Available at http://www.epa.state.oh.us/portals/35/documents/blackriv.pdf)

<table>
<thead>
<tr>
<th>ACRONYMS</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AOC</td>
<td>Area of Concern</td>
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<tr>
<td>BMP</td>
<td>Best Management Practice</td>
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<tr>
<td>CSO</td>
<td>Combined Sewer Overflow</td>
</tr>
<tr>
<td>DELT</td>
<td>Deformities, Eroded fins, Lesions and Tumors</td>
</tr>
<tr>
<td>FWS</td>
<td>Fish and Wildlife Service</td>
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<tr>
<td>GLNPO</td>
<td>Great Lakes National Program Office</td>
</tr>
<tr>
<td>GLRI</td>
<td>Great Lakes Restoration Initiative</td>
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<tr>
<td>HHEI</td>
<td>Headwater Habitat Evaluation Index</td>
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<td>Home Sewage Treatment System</td>
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<td>HUC</td>
<td>Hydrologic Unit Code</td>
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<td>IBI</td>
<td>Index of Biotic Integrity</td>
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<td>ICI</td>
<td>Invertebrate Community Index</td>
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<tr>
<td>LCMR</td>
<td>Lorain County Mercury Reduction Collaboration</td>
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<tr>
<td>MIwb</td>
<td>Modified Index of Well-being</td>
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<td>NLCD</td>
<td>National Land Cover Database</td>
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<tr>
<td>NPS</td>
<td>Nonpoint Source</td>
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<td>NRCS</td>
<td>Natural Resource Conservation Service</td>
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<td>ODH</td>
<td>Ohio Department of Health</td>
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<tr>
<td>ODNR</td>
<td>Ohio Department of Natural Resources</td>
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<tr>
<td>Ohio EPA</td>
<td>Ohio Environmental Protection Agency</td>
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<td>PAH</td>
<td>Polynuclear Aromatic Hydrocarbons</td>
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<td>PCB</td>
<td>Polychlorinated Biphenols</td>
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<td>QHEI</td>
<td>Quantitative Habitat Evaluation Index</td>
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<td>Remedial Action Plan</td>
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<td>Soil and Water Conservation District</td>
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<td>U.S. Army Corps of Engineers</td>
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<td>WQS</td>
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