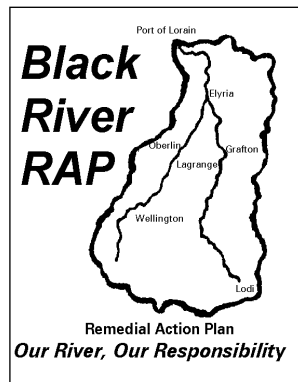


Black River Remedial Action Plan Stage 2 Report

Remedial Strategies For Area of Concern Restoration



Black River RAP Coordinating Committee
9880 South Murray Ridge Road
Elyria, OH 44035

November 30, 2011

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

TABLE OF CONTENTS

THE REMEDIAL ACTION PLAN PROCESS	4
THE BLACK RIVER ECOSYSTEM	5
Characteristics of the Black River Area of Concern	5
Current Status of Beneficial Uses in the Black River AOC	7
Unimpaired Beneficial Uses	7
Impaired Beneficial Uses	8
RAP GOALS AND EVALUATION CRITERIA FOR IMPAIRED BENEFICIAL USES	13
AOC PROGRAMMATIC STRATEGIES	14
In Recovery Phase Re-designation for Dredging and Disposal Impairment	14
Delisting Use Impairments that Meet Applicable Delisting Criteria	15
Revision of Wildlife Habitat Delisting Goals and Targets	15
COMPLETED RESTORATION AND PROTECTION STRATEGIES	16
PROPOSED AND ON-GOING RESTORATION AND PROTECTION STRATEGIES FOR REMAINING USE IMPAIRMENTS	18
PLANS, STUDIES AND ASSESSMENTS NEEDED TO ASCERTAIN CURRENT CONDITIONS OF REMAINING USE IMPAIRMENTS	25
EDUCATION PROGRAMS – ON-GOING AND COMPLETED	27
RECOMMENDATIONS FOR THE RESTORATION AND PROTECTION OF THE BLACK RIVER AOC	27
REFERENCES	29
ACRONYMS	30

Figures

Figure 1. The Black River AOC, including political jurisdictions	4
Figure 3. Watersheds of the Black River AOC	5

Appendices

Black River Agricultural NPS Plan and TMDL Strategy	Appendix 1
City of Elyria Greenway and Trail Master Plan	Appendix 2
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:

No.	Use Impairment	No.	Use Impairment
1	Restrictions on Fish and Wildlife Consumption	2	Tainting of Fish and Wildlife Flavor
3	Degradation of Fish/Wildlife Populations	4	Fish Tumors or Other Deformities
5	Bird/Animal Deformities or Reproductive Problems	6	Degradation of Benthos
7	Restrictions on Dredging Activities	8	Eutrophication of Undesirable Algae
9	Restrictions on Drinking Water Consumption or Taste or Odor Problems	10	Added Costs to Agriculture or Industry
11	Degradation of Aesthetics	12	Beach Closings
13	Degradation to Phytoplankton or Zooplankton Populations	14	Loss of Fish and Wildlife Habitat

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 mi² 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.

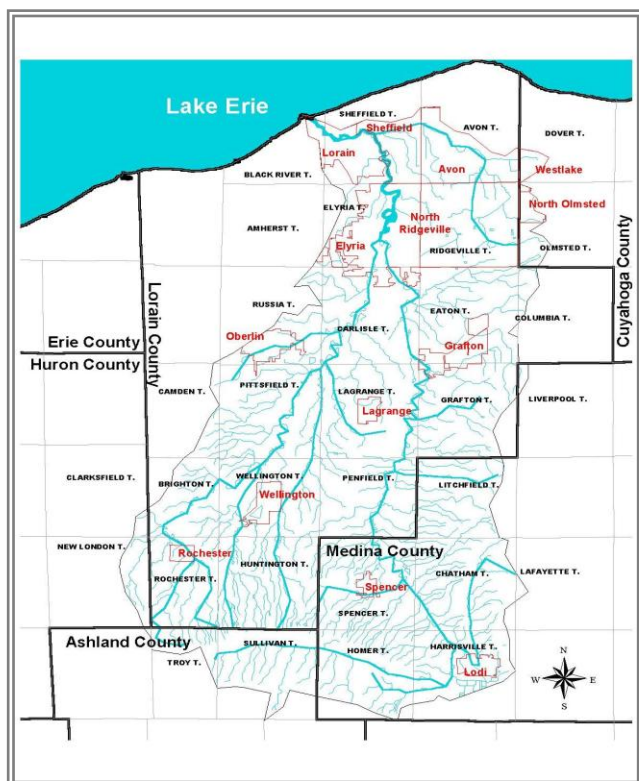


Figure 1. The Black River AOC, including political jurisdictions

The East Branch sub-watershed drains 215.9 mi² of land that has been experiencing development pressures. The West Branch sub-watershed drains 175.4 mi² of land that is predominantly agricultural and rural in nature. A third and smaller tributary system (31.6 mi² 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.

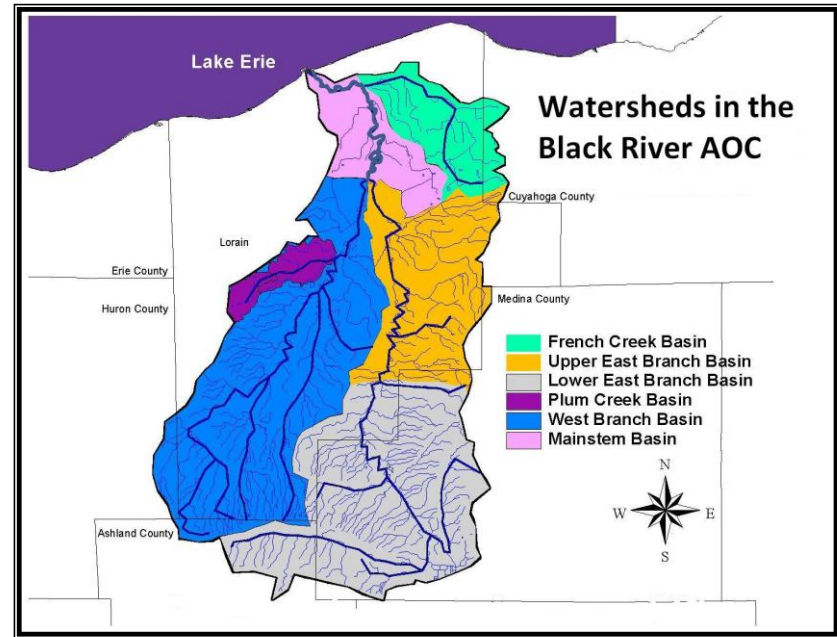


Figure 2. Watersheds of the Black River AOC

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

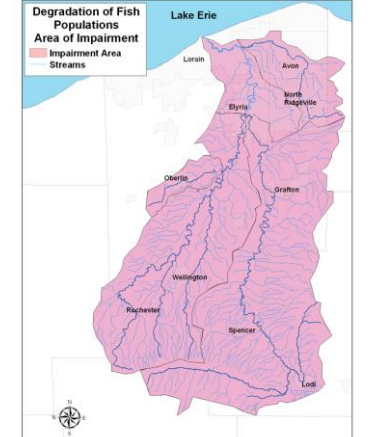
Of the fourteen beneficial uses listed in the Great Lakes Water Quality Agreement, parts or all of eight are either not impaired or In Recovery Phase in the Black River AOC, they are:

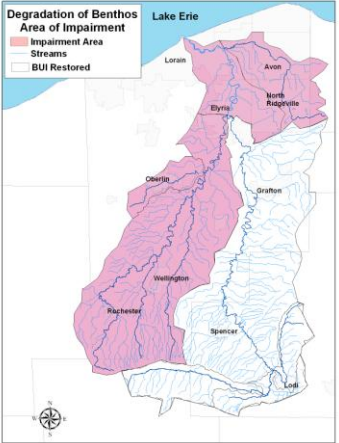
Beneficial Use No.	Beneficial Use	Conditions in the Black River Area of Concern
1	Restriction on Wildlife Consumption	Snapping turtles are currently the only wildlife species with a consumption advisory in effect in the State of Ohio as issued by the Ohio Department of Health. Snapping turtles from the 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.
2	Tainting of Fish and Wildlife Flavor	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.
3	Degradation of Wildlife Populations	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.
4	Fish Tumors and other Deformities	Impairment was re-designated to In Recovery Phase in 2004
5	Bird or Animal Deformities or Reproductive Problems	No reports of wildlife population deformities or reproductive problems from wildlife officials resulting from contaminants within the AOC.
9	Restrictions on Drinking Water Consumption. Or Taste and Odor problems	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.
10	Added Costs to Agriculture or Industry	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.
13	Degradation of Phytoplankton and Zooplankton Populations	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.

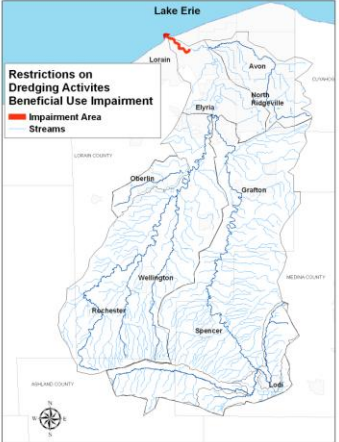
Impaired Beneficial Uses

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:

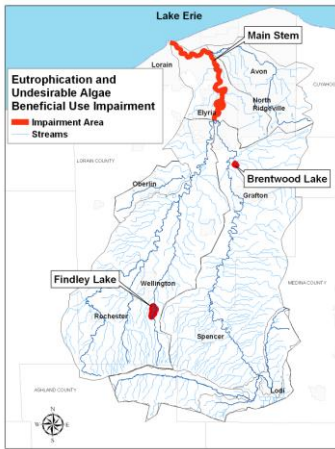
BUI #1	Restriction on Fish Consumption Use Impairment	
<p>Restrictions on Fish Consumption Beneficial Use Impairment</p> <p>Streams</p> <p>Mainstem: 1 Meal / Month Common Carp (<23") and Freshwater Drum 1 meal / 2 Months Common Carp (>23")</p> <p>East Branch: 1 Meal / Month Rock Bass, Yellow Bullhead, Smallmouth Bass 1 Meal / Month Rock Bass, Yellow Bullhead, Smallmouth Bass, Common Carp (>23")</p> <p>West Branch 1 Meal / Month White Sucker</p> <p>Findley Lake 1 Meal / Month Largemouth Bass</p>		<p>Causes of Impairment for Fish Consumption, by Location:</p> <ul style="list-style-type: none"> • Main stem <ul style="list-style-type: none"> ○ Mercury and PCBs • West Branch, East Branch and Findley Lake <ul style="list-style-type: none"> ○ Mercury <p>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.</p>

BUI #3	Degradation of Fish Populations Use Impairment	
<p>Degradation of Fish Populations Area of Impairment</p> 	<p>Causes of Impairment of Fish Populations, by Location:</p> <ul style="list-style-type: none"> • Main Stem <ul style="list-style-type: none"> ○ Low dissolved oxygen due to maintained depth of ship channel and sediment oxygen demand ○ Lack of high quality in-stream habitat ○ Embeddedness / high suspended solid load from upstream areas • French Creek <ul style="list-style-type: none"> ○ Suburbanization and infringement upon riparian corridor affect high quality habitats ○ Low flow conditions due to flat terrain • East Branch – The East Branch sub-watershed currently meets delisting criteria for Fish Populations • West Branch <ul style="list-style-type: none"> ○ 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. 	

BUI #6	Degradation of Benthos
	<p>Causes of Benthos Impairment, by Location:</p> <ul style="list-style-type: none"> • Main Stem <ul style="list-style-type: none"> ○ Loss of habitat ○ Embeddedness/High suspended solids • French Creek <ul style="list-style-type: none"> ○ Due to very limited data, determining cause of impairment is difficult but suspected as being high sediment/silt loads • West Branch <ul style="list-style-type: none"> ○ 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
	<p>Causes of Impairment for Dredging Activities, by Location:</p> <ul style="list-style-type: none"> • Main stem <ul style="list-style-type: none"> ○ Sediments contaminated with PAH and metals.

BUI #8



Eutrophication or Undesirable Algae

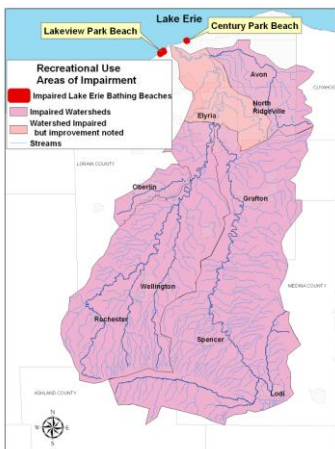
Causes of Eutrophic Impairment by Location:

- **Main Stem**
 - Low dissolved oxygen due to maintained depth of ship channel and sediment oxygen demand

Causes of Algal Impairment by Location:

- **Findley Lake**
 - Excess nutrient loads from ODNR-Findley Lake waste water treatment plant
- **East Branch**, downstream of Grafton WWTP
 - Upgrade to Grafton WWTP removed nutrient loading and nuisance algae problem improved.
- **Brentwood Lake**
 - 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

BUI #10



Beach Closings (Recreational Use)

Causes of Impairment for Recreational Use, by Location:

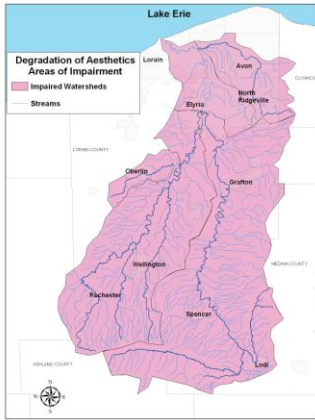
- **Lake Erie Beaches**
 - Although the two Lake Erie beaches within the AOC do not meet delisting criteria due to bacterial contamination, no link to a source within the AOC has been identified. At these beaches, waterfowl is suspected as a major source of bacteria
- **Rivers and Streams**
 - High coliform bacteria counts due to failing and under-maintained home sewage treatment systems, combined sewer overflows, livestock operations and other non-point sources

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.

BUI #11

Degradation of Aesthetics

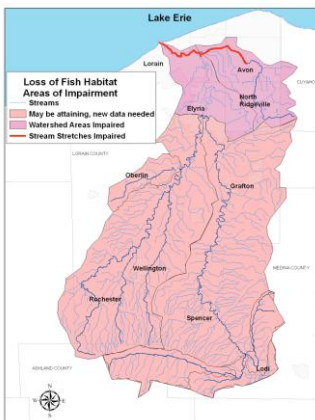


Causes of Impairment for Aesthetics, throughout the AOC:

- 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

BUI #14

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.

Note: A more extensive discussion of the impaired beneficial uses can be found in the 2009 Black River RAP Annual Report, available at: [http://www.blackriverrap.com/cms/files/File/Black%20River%20RAP/2009%20Black%20River%20RAP%20Annual%20Report\(1\).pdf](http://www.blackriverrap.com/cms/files/File/Black%20River%20RAP/2009%20Black%20River%20RAP%20Annual%20Report(1).pdf).

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:

Beneficial Use Impairment	Delisting Criteria
Restriction on Fish Consumption	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.
Degradation of Fish Populations	Index of Biotic Integrity (IBI) and Modified Index of Well Being (MIwb) values do not significantly diverge from state applicable ecoregional biological criteria. For lacustraries and nearshore areas, IBI and MIwb values do not significantly diverge from guidelines.
Fish Tumors and other deformities	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.
Degradation of Benthos	Invertebrate Community Index (ICI) values do not significantly diverge from state biological criteria in designated segments or sub-watersheds of the AOC For lacustraries, ICI should not significantly diverge from the guidelines.
Restrictions on Dredging Activities	There are no restrictions on navigational dredging or disposal activities due to contaminants in sediment.
Eutrophication or Undesirable Algae	Eutrophication
	When waters meet the minimum dissolved oxygen criteria listed in the Ohio Water Quality Standards (WQS)
	Undesirable Algae
	No nuisance growths of algae, such as filamentous <i>Cladophora</i> , 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.
Beach Closings (Recreational Use)	For <u>bathing waters</u> (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 <u>primary contact recreation</u> (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 <i>E.coli</i> , 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 <u>secondary contact recreation</u> (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 <i>E. coli</i> .
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

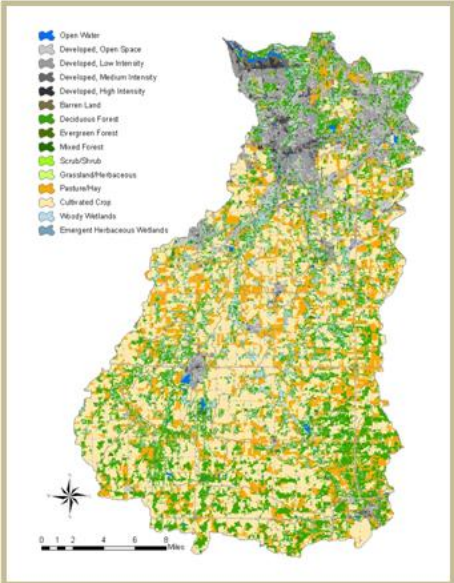
	<p>human activity in amounts sufficient to be unsightly or cause degradation; (C) Free from materials entering the waters as a result of human activity producing color, odor or other conditions in such a degree as to create a nuisance; (E) Free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growths of aquatic weeds and algae; (F) Free from public health nuisances associated with raw or poorly treated sewage.</p>
Loss of Fish and Wildlife Habitat	Fish Habitat
	<p>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.</p>
	Wildlife Habitat
	<p>Forested 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.</p> <p><i>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.</i></p>

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	Cost: \$1000
	To develop outreach materials and hold a public meeting
<p>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.</p> <p>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.</p>	

Delisting Use Impairments that Meet Applicable Delisting Criteria	Cost: \$1000
	To develop materials and hold one or more public meetings in the East Branch sub-watershed.
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	Cost: To Be Determined
	To develop new and more practical targets and milestones.
 <p>The map shows a detailed view of land use in the Black River AOC. The legend includes: Open Water (blue), Developed, Open Space (grey), Developed, Low Intensity (light grey), Developed, Medium Intensity (dark grey), Developed, High Intensity (black), Barren Land (brown), Deciduous Forest (green), Evergreen Forest (dark green), Mixed Forest (light green), Scrub/Shrub (yellow-green), Grassland/Herbaceous (yellow), Pasture/Hay (orange), Cultivated Crop (light orange), Woody Wetlands (light blue), and Emergent Herbaceous Wetlands (dark blue). The map also features a north arrow and a scale bar from 0 to 6 miles.</p>	<p>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.</p> <p>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.</p> <p>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.</p>
Figure 1. Land Uses in the Black River AOC	

COMPLETED RESTORATION AND PROTECTION STRATEGIES

Activity	Use Impairment Affected
<p>Remedial Navigation Channel Dredging</p>	<p>Restrictions on Dredging and Disposal Activities Fish Tumors and Other Deformities Degradation of Fish Habitat Restriction on Fish Consumption Recreational Use (Beach Closings)</p>
<p>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.</p> <p>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.</p>	
<p>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.</p>	
<p>Lorain Port Authority Fish Habitat Shelf</p>	<p>Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos</p>
<p>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.</p>	
<p>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.</p>	
<p>Lodi Area Restoration</p>	<p>Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos</p>
<p>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:</p> <ul style="list-style-type: none"> • 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. 	

<p>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.</p>	
<p>Brentwood Lake Dam Removal Upgrade to Grafton WWTP</p>	<p>Eutrophication/Undesirable Algae Degradation of Aesthetics</p>
<p>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.</p>	
<p>Impact Noted on Use Impairments: 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. An upgrade to the Grafton Treatment Plant, including phosphorus reduction, removed the chronic algae bloom problem in the downstream reach of the East Branch.</p>	
<p>Riparian Corridor Resolution</p>	<p>Degradation of Fish and Wildlife Habitat Degradation of Benthos Degradation of Fish Populations Degradation of Aesthetics</p>
<p>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. Unfortunately, this resolution was largely ignored by watershed stakeholders.</p>	
<p>Phase I and Phase II Assessment of 27-acre portion of RTI Coke Plant parcel</p>	<p>Degradation of Fish and Wildlife Habitat Degradation of Benthos Degradation of Fish Populations Degradation of Aesthetics</p>
<p>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.</p>	

PROPOSED AND ON-GOING RESTORATION AND PROTECTION STRATEGIES FOR REMAINING USE IMPAIRMENTS

Activity	Status	Use Impairment Affected
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)
<p>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.</p>		

Activity	Status	Use Impairment Affected	
CSO & SSO Elimination	Ongoing	Degradation of Aesthetics Eutrophication and Undesirable Algae Beach Closings (Recreational Use)	
Future Action Required			
Action	Responsible Entity	Funding Requirements	Action
Remedial actions are on-going despite CSO and SSO elimination plans are either under development or not yet approved	Cities of Elyria and Lorain	Unknown	Remedial actions are on-going despite CSO and SSO elimination plans are either under development or not yet approved

Activity	Status	Use Impairment Affected	
Ford Road Landfill Cleanup	Ongoing	Restrictions on Dredging and Disposal Activities Degradation of Fish Habitat Degradation of Fish Populations	
<p>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.</p>			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Time Frame of Activity
Completion of landfill clean up	US EPA and PRPs	Regulatory	On-going

Activity	Status	Use Impairment Affected	
Maintenance Channel Dredging	Ongoing	Restrictions on Dredging and Disposal Activities Fish Tumors and Other Deformities Degradation of Fish Habitat Degradation of Benthos Restriction on Fish Consumption	
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.			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Action
Continued monitoring of sediment quality	USACE & Ohio EPA	To be funded as part of regulatory requirements of each agency	On-Going
New Fish Tumor Study	Ohio EPA	\$180,000, Funded as part of Black, Cuyahoga & Maumee tumor study	To be conducted in 2012
New Biocriteria Study	Ohio EPA	\$21,000	To be conducted in 2012
New Fish Tissue Study	Ohio EPA & ODH	\$14,000	Proposed for 2012 and 2014

Activity	Status	Use Impairment Affected	
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: <ul style="list-style-type: none"> 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. 			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Action
Implementation of program will require funding sources to be identified and secured	NRCS SWCDs	Unknown	To Be Determined

Activity	Status	Use Impairment Affected	
Watershed Action Plans	Ongoing	Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos Degradation of Aesthetics Eutrophication or Undesirable Algae	
<p>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.</p>			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Time Frame of Activity
Completion and implementation of Watershed Action Plans for French Creek and West Branch	Lorain County	Report completion contracted with Coldwater Consulting	Plan to be completed in 2011
Secure sustainable funding for the currently vacant Watershed Coordinator position in Lorain County	To Be Determined	\$120,000 per year	To Be Determined
Completion and implementation of Watershed Action Plan for East Branch	To Be Determined	Would be included in future funding of watershed coordinator	To Be Determined

Activity	Status	Use Impairment Affected	
Elyria Greenway and Trail Master Plan (see Appendix)	Plan –Completed Actions-Ongoing	Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos Degradation of Aesthetics Eutrophication or Undesirable Algae	
<p>In September, 2009, the City of Elyria developed a Greenway Trail and Master Plan. The goals of the plan included:</p> <ol style="list-style-type: none"> Educate residents of Elyria and the county to the importance of green infrastructure practices, open space preservation and Best Management Practices (BMPs), Include environmental stewardship and conservation of the natural resources. Reduce air and water pollution through best management practices. 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

Activity	Status	Use Impairment Affected	
Mercury Reduction Program	Ongoing	Fish Consumption Advisories	
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			
Action	Responsible Entity	Funding Requirements	Time Frame of Activity
Main stem assessment of contaminant levels in fish tissues	Ohio EPA and ODH	\$7000 per year for 2 years	Proposed for 2012 and 2014
East Branch assessment of contaminant levels in fish tissues	Ohio EPA and ODH	\$7000 per year for 2 years	Unknown (To be proposed in future GLRI applications)
West Branch assessment of contaminant levels in fish tissues	Ohio EPA and ODH	\$7000 per year for 2 years	Unknown (To be proposed in future GLRI applications)
Findley Lake assessment of contaminant levels in fish tissues	Ohio EPA and ODH	\$7000 per year for 2 years	Proposed for 2012 and 2014

Activity	Status	Use Impairment Affected	
Home Sewage Treatment System (HSTS) Elimination, Upgrade and Replacement	Inspection and Outreach -Ongoing Elimination, Upgrade and Replacement - Ongoing	Degradation of Aesthetics Eutrophication and Undesirable Algae Beach Closings (Recreational Use)	
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.			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Time Frame of Activity
Outreach	County Health Departments	Included in health department HSTS inspection program	On-Going
System upgrade or replacement or System elimination with sanitary sewers	County Health Departments	(\$5,636,400 to \$75,152,000	Unknown

Activity	Status	Use Impairment Affected	
Former RTI Coke Works Cleanup	Ongoing	Restrictions on Dredging and Disposal Activities Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos Degradation of Aesthetics	
<p>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.</p>			
Future Action Required			
Action	Responsible Entity	Funding Requirements	Time Frame of Activity
Completion of various assessment and cleanup activities for areas identified in Phase I Environmental Site Assessments	City of Lorain	To Be Determined; estimated \$80 million to address all Identified Areas	Ongoing
		Coke Plant Parcel: <ul style="list-style-type: none"> • Solid Waste Management Units (SWMU) #13, 14, 15, 18, 19, 20, 21 • Benzol, Burnt Lime, Coke and By-Products Plants • Sulfate Building • Oil ASTs • Sewer and Outfall • Reservoir No. 1 • Dynamite storage area • Tar pits • Slag and stockpile areas 	
		North Fill Parcel: <ul style="list-style-type: none"> • SWMUs #22, 23, 24, 25, 26, 27, 28, 29, 30, 32 and 33 • Pipe Mill Sewer Discharge • Collection Sump at RM 5.05 • Slag and stockpile areas 	
		C&D Landfill Parcel <ul style="list-style-type: none"> • SWMU #36 	
		Turning Basin Parcel <ul style="list-style-type: none"> • Former boat house • ASTs and drums • Slag and stockpile areas 	

Lorain Black River WWTP Redevelopment CORF Project (Soil remediation on 27-acre future WTPP site to address soil contaminants, including arsenic, aluminum and PAHs, at concentrations exceeding direct contact standards)	City of Lorain	\$1,030,111 Clean Ohio Revitalization Fund	Ongoing
--	----------------	--	---------

Activity	Status	Use Impairment Affected		
Lower Black River Ecological Master Plan (see Appendix)	Plan –Completed Actions-Ongoing	Degradation of Fish Habitat Degradation of Fish Populations Degradation of Benthos Degradation of Aesthetics Eutrophication or Undesirable Algae		
<p>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.</p>				
Future Action Required				
Action	Responsible Entity	Funding Requirements		Time Frame of Activity
Monitoring of effectiveness of restoration projects	City of Lorain	Included in funding of specific projects		On-going
Various restoration activities listed in Master Plan	City of Lorain and other river stakeholders	Master Plan Components Note: Dollar amounts were approximated in the Plan.		
		Fish Shelves	\$1,402,800	Ongoing
		Slag Pile Remediation	\$3,211,000	Ongoing
		Wetland Restoration or Construction	\$4,812,000	Unknown
		Streambank Stabilization	\$1,497,500	Ongoing
		Bulkhead Habitat	\$11,844,000	Unknown
		Invasive Species Removal	\$205,000	Unknown
		Submerged Aquatic Plantings	\$124,440	Unknown
Fish Baskets and Floating Wetlands	\$305,000	Will not be undertaken by RAP; For Research Only		

		Easement Acquisition/Wetland Purchase	\$1,100,250	Unknown
Black River Restoration ARRA Project (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	City of Lorain	\$6,300,000 ARRA Funds		On-going
		\$100,000 Supplemental Enforcement Project Funds from Ohio EPA		
Lower Black River Habitat Restoration NOAA Project Phase I (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	City of Lorain	\$1,697,800		Ongoing
Lower Black River Habitat Restoration NOAA Project Phase II (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	City of Lorain	\$1,099,750		Application Submitted
Lower Black River Habitat Restoration NOAA Project - Phase III (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	City of Lorain	\$350,000		Application Submitted
Monitoring of biocriteria in main stem	Ohio EPA	\$21,000		Proposed for 2011, included in 2010 GLRI application from Ohio EPA
Outreach – Develop a video on the success of the Master Plan and remedial efforts of the City of Lorain	Unknown	\$25,000		Unknown

PLANS, STUDIES AND ASSESSMENTS NEEDED TO ASCERTAIN 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.

Action	Responsible Party	Cost
Attainment Study and development of Watershed Action Plan for the East Branch Sub-Watershed	Attainment study – Ohio EPA WAP - To Be Determined	Attainment Study funded in current Ohio EPA grant WAP - To Be Determined
<p>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.</p> <p>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.</p>		

Action	Responsible Party	Cost
Fish Tumor Study of the Main Stem	Black River RAP Ohio EPA USGS	\$180,000 (for 3 AOCs) 2011 GLRI Ohio EPA grant
<p>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.</p>		

Action	Responsible Party	Cost
Algal Study of Findley Lake	Ohio EPA	\$500
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.		

Action	Responsible Party	Cost
Comprehensive Study of the Main Stem, French Creek, East Branch and West Branch Sub-watersheds	Ohio EPA (as part of Ohio Lake Erie AOC/LaMP Program Support Grant)	\$36,000 for West Branch \$25,000 for East Branch \$21,000 for Main stem \$17,000 for French Creek
	USACE	To Be Determined
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.		

EDUCATION PROGRAMS – ON-GOING AND COMPLETED

Web Pages	
<ul style="list-style-type: none"> • US EPA/GLNPO • Ohio EPA • Local Black River RAP 	Ongoing, periodically updated
Videos	
<ul style="list-style-type: none"> • Early Video • Rediscovering the Black River Video • Your Black River Watershed (A compilation of the first two videos) • Home Sewage Treatment System Video 	<p>Ongoing, on Black River web page (www.blackriverrap.com/multimedia)</p> <p>Home Sewage Treatment Video is being used by Lorain County General Health District in their HSTS program.</p> <p>Copies of the HSTS video were presented to every county health department in the Ohio Lake Erie watershed.</p>
Brochures	
<ul style="list-style-type: none"> • Living Along French Creek • Living Along the East Branch • Living Along the West Branch 	<p>Ongoing, used at outreach events and by permitted storm water entities as part of their education/outreach requirement.</p> <p>Available at: http://www.blackriverrap.com/resources</p>
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	
<ul style="list-style-type: none"> • 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, MIwb, 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

Black River Remedial Action Plan Coordinating Committee, 2009, Lower Black River Ecological Restoration Master Plan
(Available at http://www.blackriverrap.com/files/announcements/attachments/204_December_final_report.pdf)

Black River Remedial Action Plan Coordinating Committee, 1991, Black River Remedial Action Plan Stage 1 Report

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, 1998, Biological and Water Quality Study of the Black River Basin. Lorain and Medina Counties, Ohio.
(Available at <http://www.epa.state.oh.us/portals/35/documents/black97.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>)

US Policy Committee, 2001, Restoring United States Areas of Concern: Delisting Principles and Guidelines
(Available at <http://www.epa.gov/glnpo/aoc/rapdelistingfinal02.PDF>)

ACRONYMS

AOC	Area of Concern	NPS	Nonpoint Source
BMP	Best Management Practice	NRCS	Natural Resource Conservation Service
CSO	Combined Sewer Overflow	ODH	Ohio Department of Health
DELT	Deformities, Eroded fins, Lesions and Tumors	ODNR	Ohio Department of Natural Resources
FWS	Fish and Wildlife Service	Ohio EPA	Ohio Environmental Protection Agency
GLNPO	Great Lakes National Program Office	PAH	Polynuclear Aromatic Hydrocarbons
GLRI	Great Lakes Restoration Initiative	PCB	Polychlorinated Biphenols
HHEI	Headwater Habitat Evaluation Index	QHEI	Quantitative Habitat Evaluation Index
HSTS	Home Sewage Treatment System	RAP	Remedial Action Plan
HUC	Hydrologic Unit Code	SSO	Sanitary Sewer Overflow
IBI	Index of Biotic Integrity	SWCD	Soil and Water Conservation District
ICI	Invertebrate Community Index	TMDL	Total Maximum Daily Load
LCMRC	Lorain County Mercury Reduction Collaboration	USACE	U.S. Army Corps of Engineers
MIwb	Modified Index of Well-being	US EPA	U.S. Environmental Protection Agency
NLCD	National Land Cover Database	WQS	Water Quality Standards