

DRAFT

**Buffalo River Remedial Action Plan
2008 Status Report**



Buffalo River
Remedial Action Plan

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Table of Contents

PAGE

1.	Introduction.....	1
1.1	Location of Buffalo River Area Of Concern (AOC).....	1
1.2	Purpose of Status Report.....	1
2.	Beneficial Uses & Impairment and Delisting Criteria & Restoration Targets.....	4
3.	Accomplishments Between 2002 – June 2008.....	8
3.1	Water Quality.....	8
3.1.1	Major Accomplishments.....	8
3.1.1.1	Rotating Intensive Basin Studies (RIBS).....	8
3.1.1.2	Assessment of Phytoplankton and Eutrophication.....	9
3.1.1.3	Buffalo Sewer Authority LTCP.....	9
3.1.1.4	BRIC.....	10
3.2	Contamination.....	10
3.2.1	Major Accomplishments.....	11
3.2.1.1	Upper Buffalo River Remedial Investigation/Feasibility Study.....	11
3.2.1.2	Great Lakes Legacy Act Project (Lower Buffalo River).....	11
3.2.1.3	BUI #7.....	11
3.2.1.4	NY State Superfund Sites.....	12
3.2.1.5	VCP/BCP/ERP Sites.....	13
3.2.2	Next Steps and Commitments.....	14
3.2.2.1	Contaminated Sediments.....	14
3.2.2.2	Inactive Hazardous Waste Sites.....	14
3.3	Fish, Wildlife, and Macroinvertebrates.....	15
3.3.1	Major Accomplishments.....	15
3.3.1.1	Delisting Criteria Adopted.....	15
3.3.1.2	Rotating Intensive Basin Study (RIBS).....	16
3.3.1.3	Assessment of Potential Aquatic Habitat Restoration Sites.....	17
3.3.1.4	Fish Contaminant Study.....	19

3.3.1.5	Herpetological Survey.....	20
3.3.1.6	Bird Population Survey.....	20
3.3.1.7	Buffalo River Habitat Restoration Project.....	20
3.3.1.8	Buffalo River Urban Canoe Trail.....	22
3.3.1.9	Brownfield Opportunity Areas (BOA).....	22
3.3.1.10	Elk Street Revitalization and Planning.....	24
3.3.1.11	Buffalo River Greenway Implementation.....	24

1. INTRODUCTION

1.1. Location of Buffalo River Area of Concern (AOC)

The Buffalo River is located in the City of Buffalo, Erie County, in western New York State. The river flows from the east and discharges into Lake Erie at the head of the Niagara River. The Buffalo River Area of Concern (AOC) “impact area” extends from the mouth of the Buffalo River to the farthest point upstream at which the backwater condition exists during Lake Erie’s highest monthly average lake level. The impact area is 6.2 miles (10 km) in length and the AOC also includes the entire 1.4 mile (2.3 km) City Ship Canal, located adjacent to the river (Figure 1-1).

1.2. Purpose of Status Report

As required for all Areas of Concern through the Great Lakes Water Quality Agreement, a combined Stage 1 and Stage 2 Remedial Action Plan (RAP) was completed and issued for the Buffalo River in November 1989. Between 1989 and 2002, NYS Department of Environmental Conservation (DEC), as RAP Coordinator, tracked the progress within the Buffalo River AOC through a series of Status Reports.

The objective of the RAP was to document the issues concerning the Buffalo River and a strategy to remediate/improve those issues. The main issues that affected the Buffalo River included: Water Quality, Contaminated Bottom Sediments, Inactive Hazardous Waste Sites, Municipal and Industrial Wastewater Facilities, Combined Sewer Overflows, and Fish and Wildlife Habitat.

In October 2003, the USEPA Great Lakes National Program Office (GLNPO) selected

Buffalo Niagara Riverkeeper (formerly Friends of the Buffalo Niagara River) to coordinate the implementation of the Buffalo River Action Plan. Through the coordination of Buffalo Niagara Riverkeeper and with the assistance of the Remedial Advisory Committee (RAC), NYSDEC, and other governmental and non-governmental agencies and organizations, the Buffalo River AOC has made significant progress towards delisting the AOC. Buffalo Niagara Riverkeeper produced a Status Report in 2005 that documented this progress towards delisting between April 2002 and October 2005.

This Draft Status Report document includes all progress and commitments that have been identified between 2002 and June 2008. The projects listed are neither exclusive nor exhaustive, and a more thorough analysis of the AOC will be available later this year. Buffalo Niagara Riverkeeper, with assistance from the Remedial Advisory Committee (RAC), is in the process of revising and rewriting the entire Remedial Action Plan. The rewrite will not change the foundation of the original RAP, but will incorporate newly-developed data, research, investigations, and remedial progress into the status of Beneficial Use Impairments and the updated Remedial Strategy.

All documents identified in this Draft Status Report, including the previous status reports and the original RAP, are available by contacting Buffalo Niagara Riverkeeper.

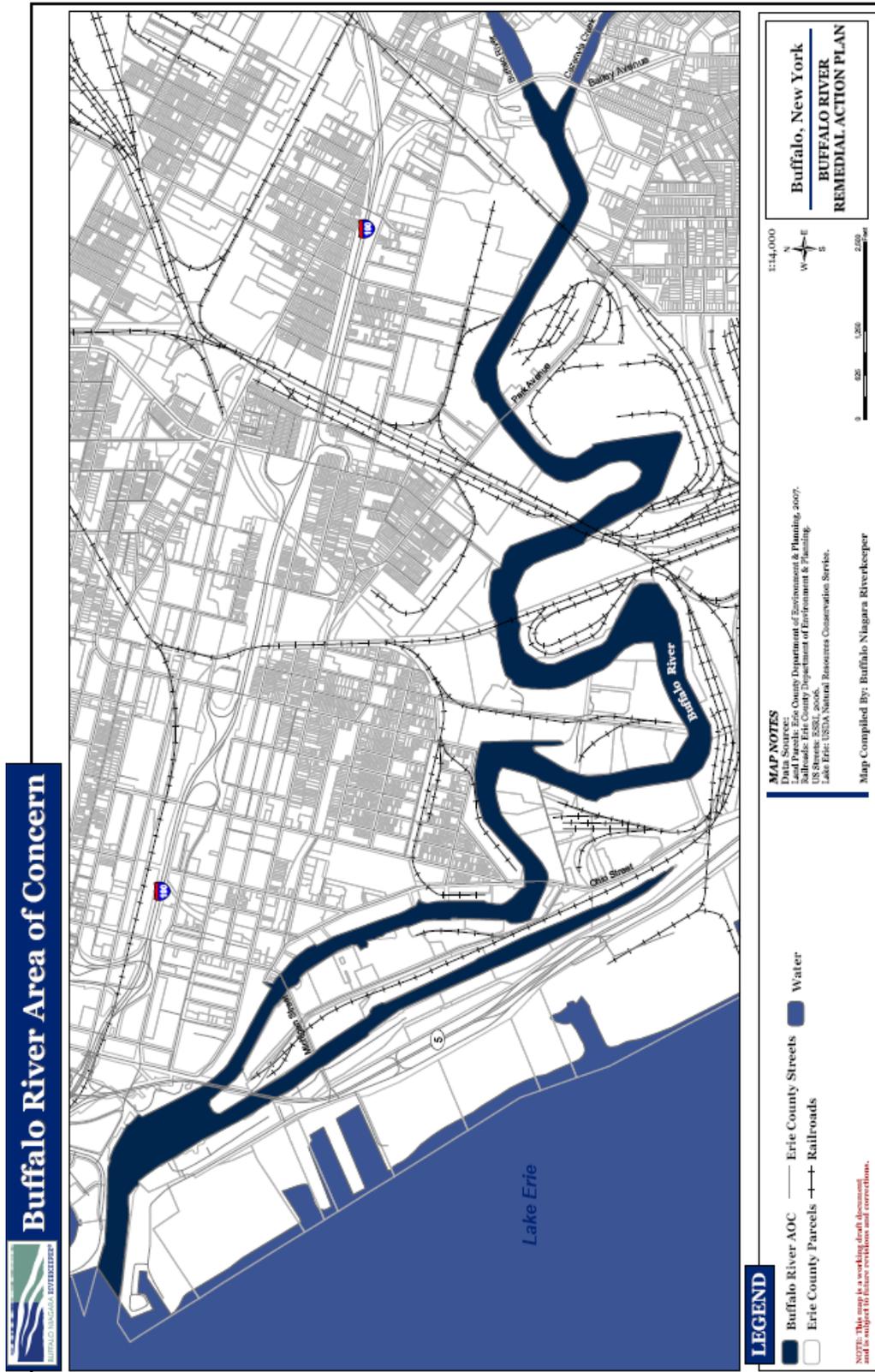


Figure 1-1 Location of Buffalo River AOC

2. Beneficial Uses & Impairments and Delisting Criteria & Restoration Targets

The Great Lakes Water Quality Agreement (GLWQA) lists “use impairments as “changes in the chemical, physical, and biological integrity of the Great Lakes System that create barriers to the use of the water resource.” These use impairments have become the template for determining the extent to which the river is degraded and for measuring progress toward its clean up. Once a “beneficial use” has been restored, it can be “delisted” using the IJC’s criteria as guidance. But more importantly, delisting criteria or targets are locally developed through a process of assessment and are always consensus-based.

In December 2001, the US Policy Committee published “Restoring Great Lakes Areas of Concern – Delisting Principles and Guidelines.” These guidelines allow for the delisting of individual use impairments in the entire AOC under the following circumstances:

- When locally derived delisting criteria have been met;
- When the use impairment is due to natural rather than man-made causes;
- When the use impairment is not limited geographically to the AOC, but rather is typical of regional conditions;
- When the source of the use impairment is outside the boundaries of the AOC; or
- When the beneficial use cannot be fully restored, even when all practical remedial actions have been implemented.

Table 2-1 identifies the Beneficial Use Indicators (BUI), their status over time, and its likely cause. The 1989 RAP determined that eight BUIs were either “impaired” or “likely impaired.” Since that time, a thorough review of the BUIs has been conducted. Several changes

have been determined, including the change of “Degradation of Aesthetics” from not impaired to impaired and “Degradation of Zooplankton” from unknown to not impaired.

Table 2-1 - Buffalo River AOC Beneficial Uses

<i>Impairment Indicator</i>	<i>1989 Status</i>	<i>2005 Status</i>	<i>2008 Status</i>	<i>Known of Likely Cause</i>
1. Restrictions on Fish & Wildlife Consumption	Impaired	Impaired	Impaired	PCB’s and Chlordane in sediments.
2. Tainting of Fish & Wildlife Flavor	Likely Impaired	Likely Impaired	Likely Impaired	PAHs in sediments.
3. Degradation of Fish & Wildlife Populations	Likely Impaired	Likely Impaired	Impaired/Likely Impaired*	Low dissolved oxygen, river channelization, and contaminated sediments. *Fish Populations are Impaired while Wildlife Populations are Likely Impaired.
4. Fish Tumors and Other Deformities	Impaired	Impaired	Impaired	Sediments, navigational dredging.
5. Bird or Animal Deformities or Reproductive Problems	Likely Impaired	Likely Impaired	Likely Impaired	PCBs, DDT, and metabolites in sediments.
6. Degradation of Benthos	Impaired	Impaired	Impaired	Sediments, navigational dredging.
7. Restrictions on Dredging	Impaired	Impaired	Impaired	Various contaminants in sediments.
8. Eutrophication or Undesirable Algae	Not Impaired	Unknown	Not Impaired	Not Applicable.
9. Restrictions on Drinking Water	Not	Not	Not Applicable	Not Applicable.

Consumption or Taste and Odor Problems	Impaired	Applicable		
10. Beach Closings	Not Impaired	Not Applicable	Not Applicable	Sediments, CSOs, and bacterial loading from upper watershed.
11. Degradation of Aesthetics	Not Impaired	Impaired	Impaired	Floatables, debris and foul odor from CSOs and upper watershed.
12. Added Costs to Agriculture and Industry	Not Impaired	Not Impaired	Not Impaired	Not applicable.
13. Degradation of Phytoplankton and Zooplankton Populations	Not Impaired	Not Impaired for Zooplankton; Unknown for Phytoplankton	Not Impaired	Not applicable.
14. Loss of Fish & Wildlife Habitat	Impaired	Impaired	Impaired	Physical disturbance such as bulk heading, dredging and steep slopes, and lack of suitable substrate.

For Beneficial Uses that are considered “Impaired,” it is required that delisting criteria or targets be established. Once these targets are met, the BUI can then be considered “Not Impaired” and can be delisted. Table 2-2 describes the targets that have been established to date which need to be met in order to “delist” the beneficial uses of the Buffalo River. Like all US AOCs, the Buffalo River AOC is on track to finalize all of its delisting criteria and targets by December 2008.

Table 2-1 - Summary of Delisting Criteria/Restoration Targets

BUI #	Beneficial Use	Status	Delisting Criteria/Restoration Target(s)
1	Restriction on Fish & Wildlife Consumption	Impaired	<ol style="list-style-type: none"> 1) There are no AOC-specific fish and wildlife consumption advisories by New York State (e.g. carp for PCBs); AND 2) When contaminant levels in native and exotic fish and wildlife populations that could be consumed (e.g. walleye, bass, bluegills, perch, eels, and pike) do not exceed current NYS standards, and levels are representative of a non-AOC reference community.
4	Fish Tumors and Other Deformities	Impaired	Fish tumors and other deformities shall be no greater than expected rates at non-AOC reference communities in species such as brown bullhead and suckerfish.
6	Degradation of Benthos	Impaired	<ol style="list-style-type: none"> 1) Benthic macroinvertebrate communities are “non-impacted” or “slightly impacted” according to NYSDEC indices¹; OR 2) In the absence of conclusive community structure data, the toxicity of sediment-associated contaminants is not statistically higher than controls.
7	Restrictions on Dredging	Impaired	No limitations on disposal of dredge spoils.
11	Degradation of Aesthetics	Impaired	<ol style="list-style-type: none"> 1) Minimize debris, general litter, floatables, or contaminants in the river or shoreline via point source or non-point sources through the implementation of Best Management Practices; AND 2) Organic, chemical, and biological contaminants should not persist in concentrations that can be detected as visible film, sheen, or discoloration on the surface, detected by odor, or form deposits on shorelines and bottom sediments.
14	Loss of Fish and Wildlife Habitat	Impaired	<ol style="list-style-type: none"> 1) Invasive plant species, including Japanese knotweed and Purple loosestrife will be managed at levels that do not disrupt the sustainability of native, upland and aquatic plant communities <i>*Additional delisting criteria and targets have been drafted and are currently undergoing a thorough peer review by several technical advisory groups. It is expected that final criteria will be completed and accepted by the RAC by September 2008.</i>

3. Accomplishments Between 2002 – June 2008

3.1 Water Quality

The major factors that are known to affect water quality in the Buffalo River are: 1) low dissolved oxygen, 2) turbidity, 3) heavy metals, and 4) bacterial contamination. The following beneficial use impairments, or likely impairments, are directly related to the water quality in the Buffalo River AOC.

BUI # 3 – Degradation of Fish and Wildlife Populations - Impaired

BUI # 10 – Beach Closings – Not Applicable to AOC, but directly related to primary and secondary contact

BUI #11 – Degradation of Aesthetics – Impaired

3.1.1 Major Accomplishments

3.1.1.1. Rotating Intensive Basin Studies (RIBS) - The RIBS report is a quantitative summary of the concentrations of chemical and physical constituents in the water column, sediments and biological tissue. NYSDEC sampled fourteen sites within the Buffalo River Watershed in 2000 and 2001. The report released in 2005 showed that dissolved oxygen continued to be a parameter of concern for the Buffalo River.

3.1.1.2. Assessment of Phytoplankton and Eutrophication - Riverkeeper contracted The Research Foundation at Buffalo State College to complete an

assessment of phytoplankton health, composition, and eutrophication in the AOC. Work on this project began in June 2006 and field work commenced in October 2006. The goal of this study was to provide data and guidance on determining the status of Beneficial Use Impairment #8 (Eutrophication or Undesirable Algae) and #13 (Degradation of Phytoplankton) for the Buffalo River Area of Concern (AOC). Specifically, the study: i) determined the trophic level of the AOC; ii) determined if microcystins (algal toxins) were present that may present a risk to fish, wildlife, or human health (as an indicator of undesirable algae); and iii) established the dominant phytoplankton taxa and examined community composition characteristics to determine if phytoplankton have been negatively impacted by human activity.

3.1.1.3. Buffalo Sewer Authority LTCP - In 2005, The Buffalo Sewer Authority completed a Draft for its draft Long Term Control Plan (LTCP) that identified the best management practices for CSO abatement. The Buffalo Sewer Authority has already begun implementing some of the recommendations, including the Hamburg St. drain and some sewer separation in Kaisertown. The BSA is currently negotiating with NYSDEC and USEPA for LTCP implementation, and is planning for “Phase I” implementation in late 2008.

3.1.1.4. BRIC - The Buffalo River Improvement Corporation (BRIC) was developed in the mid-1960’s to provide cooling water to industries along the River with cooling water and it also help to increase the flow rate, and lessen the

retention time, of the River. As of 2006, the only industry that is currently utilizing (and maintaining) the BRIC was PVS Chemicals, Inc., with an average flow of 5.13mgd. This non-contact cooling water is discharged into the Buffalo River at PVS Outfall 001 and PVS Outfall 002. While PVS Chemicals, Inc. has no future projections for BRIC usage, it can be assumed that it will be similar to previous years (4-6mgd).¹

3.2 Contamination

Two forms of chemical contamination affect the Buffalo River AOC – contaminated bottom sediments and upland contamination associated with inactive hazardous waste sites or current industry. The following beneficial use impairments, or likely impairments, are directly related to sediment and upland contamination in the Buffalo River AOC.

BUI #1 – Restrictions on Fish & Wildlife Consumption - Impaired

BUI # 2 – Tainting of Fish and Wildlife Flavor – Likely Impaired

BUI #3 – Degradation of Fish and Wildlife Populations – Likely Impaired

BUI #4 – Fish Tumors and Other Deformities - Impaired

BUI # 5 – Bird or Animal Deformities or Reproductive Problems – Likely Impaired

BUI # 6 – Degradation of Benthos - Impaired

BUI # 7 – Restrictions on Dredging - Impaired

BUI # 14 – Loss of Fish and Wildlife Habitat – Impaired

3.2.1 Major Accomplishments

¹ Personal Communication, Christopher Balduf

- 3.2.1.1. Upper Buffalo River Remedial Investigation/Feasibility Study** - This project began in 2005 through an agreement between Buffalo Niagara Riverkeeper and the US Army Corps of Engineers-Buffalo District. NYSDEC provided sediment sampling and analysis of over 160 cores from the upper 3 miles of the Buffalo River. In 2006, the USEPA-Great Lakes National Program Office (GLNPO) took over management and committed discretionary funding to the project. Since then, this RI/FS process has incorporated the lower three miles of the River (including the City Ship Canal) and a draft RI/FS report is expected to be completed in late 2008.
- 3.2.1.2. Great Lakes Legacy Act Project (Lower Buffalo River)** - In 2007, Buffalo Niagara Riverkeeper and USEPA-GLNPO signed a Great Lakes Legacy Act Project Agreement to conduct an RI/FS for the lower three miles of the Buffalo River. NYSDEC again committed resources to the effort and conducted sediment sampling and analysis. Since that time, the RI/FS effort has been absorbed into the existing “upper River RI/FS”, and the Legacy Act Agreement will be utilized for the Remedial Design phase, set to begin in early 2009. All data, research, and the Draft RI/FS report will be publicly available in late 2008.
- 3.2.1.3. BUI # 7** - Restriction of Dredging Adopted November 2004 “No limitations on disposal of dredge spoils.”
- 3.2.1.4. NY State Superfund Sites** - Currently there are twelve inactive hazardous waste sites in the watershed, of which 7 are in the AOC, with a Class 2 designation from NYSDEC. NYSDEC assigns this classification to sites at

which: a) the disposal of hazardous waste has been confirmed and the presence of such hazardous waste or its components or breakdown products represent a significant threat to the environment or to health; or b) hazardous waste disposal has not been confirmed, but the site has been listed on the Federal National Priorities List (NPL). Table 3-1 lists the current Superfund Sites with an “02” designation.

Table 3-1 Superfund Sites with “02” designation

<i>Identification Number</i>	<i>Site Name</i>
915012	Buffalo Color Area “D”
915026	Buffalo Outer Harbor-Radio Tower Area
915046B	Ramco Steel
915047	Republic Steel (LTV)
915054	Alltift Landfill
915071	Lehigh Valley RR
915105	Depew Landfill
915151	318 Urban Street
915157	Mr. C’s Dry Cleaner
915167	Fourth St Site

3.2.1.5 Voluntary Cleanup Program / Brownfield Cleanup Program / Environmental Restoration Program - New York established the Voluntary Cleanup Program (VCP) to address the environmental, legal, and financial barriers that often hinder the redevelopment and reuse of contaminated properties. The VCP was developed to enhance private sector cleanup of brownfields by enabling parties to radiate sites using private

rather than public funds and to reduce the development pressures on “greenfield” sites. Sites included in the VCP, BCP, and ERP are not added to the State’s official registry list. These sites either have a classification code of A or C. An A classification is assigned to a non-registry site where work is underway and not yet complete. A C classification is used for sites where the NYSDEC has determined that remediation has been satisfactorily completed, has received a Certificate of Completion (COC), but may require ongoing maintenance. Table 3-2 lists the sites included in this program that have an “A” Status.

Table 3-2 - Sites in the VCP, BCP, and ERP with an "A" Status

<i>Number</i>	<i>Name</i>		<i>Number</i>	<i>Name</i>
V00215	Sovereign Specialty Chemicals, Inc.		B00164	Hanna Furnace (Subparcel 3)
V00319	Hanna Furnace		B00174	Franczyk Park
V00370	Pizza Hut		B00196	Boone Park
V00435	Hanna Furnace		E915181	90 Hopkins St
V00619	Steelfields		E915182	Sycamore Village
V00663	Buffalo Business Park		E915193	Buffalo Lakeside Commerce Park
B00149	Buffalo Outer Harbor		C915201	Exxon Mobil Oil
B00164	Hanna Furnace (Subparcel 3)		C915204	Steelfields Area IV
B00174	Franczyk Park		C915208	275 Franklin St
B00196	Boone Park		C915209	Former Buffalo China Site
E915181	90 Hopkins St		C915211	NOCO #S41
E915182	Sycamore Village		C915221	Sonwil Buffalo
E915193	Buffalo Lakeside		C915223	Niagara St and

	Commerce Park			Pennsylvania Ave
B00149	Buffalo Outer Harbor			

3.2.2 Next Steps and Commitments

3.2.2.1 Contaminated Sediments - Buffalo Niagara Riverkeeper, in partnership with USEPA/GLNPO, NYSDEC, and the US Army Corps of Engineers- Buffalo District, will continue work on the contaminated sediment remediation of the Buffalo River. Nearly \$2million in combined resources has been invested in the RI/FS process since 2003. Another \$1 million is committed for the Remedial Design phase in 2009. Though the remediation of the Buffalo River will take multiple years and current cost estimates range from \$40 million - \$70 million, the “local sediment team” is making steady progress and it is expected that a small scale remediation project will be implemented in 2010.

3.2.2.2 Inactive Hazardous Waste Sites - NYS Department of Environmental Conservation is the lead agency in regards to inactive hazardous waste sites. All sites are monitored and inspected by NYSDEC during and after their remediation. Status of the progress on Inactive Hazardous Waste site remediation is available on the NYSDEC website <http://www.dec.ny.gov>

3.3 Fish, Wildlife, and Macroinvertebrates

Fish and wildlife issues related to the Buffalo River AOC not only include population number, diversity, and overall health but also to fish and wildlife habitat and their relationship to humans. The following beneficial use impairments, or likely impairments, are directly related to the health of fish, wildlife, and macroinvertebrate populations in the Buffalo River AOC.

BUI #1 – Restrictions on Fish & Wildlife Consumption - Impaired

BUI # 2 – Tainting of Fish and Wildlife Flavor – Likely Impaired

BUI #3 – Degradation of Fish and Wildlife Populations – Fish Populations Impaired, Wildlife Populations Likely Impaired

BUI #4 – Fish Tumors and Other Deformities - Impaired

BUI # 5 – Bird or Animal Deformities or Reproductive Problems – Likely Impaired

BUI # 6 – Degradation of Benthos - Impaired

BUI # 14 – Loss of Fish and Wildlife Habitat – Impaired

3.3.1 Major Accomplishments

3.3.1.1 November 4, 2004 – Several Delisting Criteria Adopted

BUI#1 – Restriction on Fish and Wildlife Consumption - “1) There are no AOC-specific fish and wildlife consumption advisories by New York State (i.e. carp for PCBs); and 2) When contaminant levels in native and exotic fish and wildlife populations that could be consumed (i.e.; walleye, bass, bluegills, perch, eels, and pike) do not exceed current New York State standards for 3-5 consecutive years and levels are representative of a non-AOC reference community.”

BUI#4 – Fish Tumors and Other Deformities - “Fish tumors and deformities shall be no greater than expected rates at non-AOC reference communities in species such as brown bullhead or suckerfish.”

3.3.1.2 Rotating Intensive Basin Study (RIBS) – The RIBS report is a quantitative summary of the concentrations of chemical and physical constituents in the water column, sediments and biological tissue. These concentrations are compared to assessment criteria to determine if designated uses of the waterbody are supported. The water quality data and information generated by the RIBS program are used to support many monitoring and assessment functions within NYSDEC Division of Water, including the development of the Waterbody Inventory/Priority Waterbody List.² 14 sites in the Buffalo River Watershed were sampled by the NYSDEC in 2000 and 2001 and the results showed that: 1) Water quality parameters of concern are iron, ammonia, water temperature and dissolved oxygen, 2) Macroinvertebrate sampling (in the water column) indicated a slightly impacted condition. The source of impacts is still considered to be from municipal and industrial inputs, and 3) There continues to be a fish advisory for carp (eat none) due to PCB contamination.

3.3.1.3 Assessment of Potential Aquatic Habitat Restoration Sites - In 2003, the NYSDEC Great Lakes Protection Fund awarded a grant to the Buffalo Niagara Riverkeeper to assess potential habitat sites in the Buffalo River.

² NYSDEC RIBS 2005, 2005 RAP Status Report

Researchers from Buffalo State College and Youngstown State-Ohio collected and evaluated data on fish and benthic populations, conducted water quality analysis, and surveyed vegetation and recreational use at ten potential restoration sites. The results (in summary):

- Larval fish sampling showed similar species diversity and abundance in 2003-04 as compared to 1993 (8-10 species found). No site-specific trends were observed. The adult/juvenile fish sampling showed similar species diversity and abundance in 2003-04 compared to 1993 (15-20 species across all sites). The lowest species diversity occurred at the sites in the upper-most and lower-most reaches of the AOC impact area.
- For the river as a whole, DELT (Deformities, Eroded fins, Lesions, and Tumors) anomaly scores in fish averaged 37%, which is much higher than what would be expected for a moderately impacted (2-5%) or unimpacted (<2%) river. The rate varied greatly among species, with a low of 14% in pumpkinseed to an extremely high of 87% in brown bullhead. The other most commonly found species had the following DELT scores: common carp 67%, gizzard shad 51%, largemouth bass 34%, and golden shiner 22%.The Buffalo River AOC continues to be dominated by a low diversity benthic invertebrate community that is broadly tolerant of pollution and environmental degradation. High densities of tubificid oligochaetes (though lower than historic maxima), and their numerical dominance

of the benthos suggest poor environmental health. Oligochaete densities were higher in the channel than at shoreline habitat restoration sites. Fewer invertebrate families were collected in this study than in the 1990s, possibly even indicating some reversal of biotic recovery. Substantially more families occurred at shoreline sites than in the navigational channel, although the habitat restoration sites were still dominated by pollution-tolerant oligochaetes and chironomids. Likewise, chironomid taxonomic richness was markedly higher at the habitat sites than in the channel, but species largely constituted pollution-tolerant species and genera. Chironomid mouthpart deformities remain very high within the navigational dredge channel, but interestingly, all of the rather limited number of larvae from shoreline sites had developed normally.

- More than 50 plant species were collected from the Buffalo River shoreline and herbaceous vegetation was well-developed at all sites. The 10 restoration sites differed considerably in their development of overhanging cover, ranging from 0-80%. Submerged macrophyte beds are not extensive, but are present at most sites. The presence of invasive plant species, including tree-of-heaven, Japanese knotweed, purple loosestrife, and submerged Eurasian watermilfoil degrades many of the potential restoration sites.
- Ecological integrity, as reflected by biota and water quality, certainly has improved in the Buffalo River AOC, as compared to 1970's

conditions. However, there does not appear to be any improvement since the early 1990s. Habitat restoration measures such as improved overhang cover, macrophyte plantings, eradication of exotic plant species, removal of old dock pilings, naturalization of shorelines, or removal of contaminated bed sediment could improve ecological integrity at selected sites. Constraints on ecological integrity that may prove more challenging to overcome include warmer water temperatures and low dissolved oxygen levels.³

3.3.1.4 Fish Contaminant Study - Buffalo Niagara Riverkeeper coordinated the efforts of NYSDEC, USEPA-Region 2, USFWS, and USACE to conduct a fish contaminant study in the summer of 2007. This sample collection included all trophic levels of fish throughout the 6.2 mile AOC. The analysis will be used to determine overall fish health and contaminant levels, potential human health risks from consumption of contaminated fish, as well as help identify site specific bioavailability or toxic hotspots to be used in the RI/FS. Results are expected by July 2008.

3.3.1.5 Herpetological Survey - The Buffalo Zoo accepted a contract to assess herpetological populations and health in the AOC in the spring and summer of 2007. Work began in April 2007 and final results are expected by late summer 2008. The data will be used in the development of restoration

³ 2005 RAP Status Report

targets for two BUIs, “Loss of Habitat,” and “Degradation of Wildlife Populations.”

3.3.1.6 Bird Population Survey - Bird Population Survey- the final count of the two year bird assessment by Canisius College and Buffalo Ornithological Society was performed on January 15, 2007. Researchers are currently evaluating the June breeding season data to be referenced in the creation of restoration targets for two BUIs, “Loss of Habitat” and “Degradation of Wildlife Populations.”

3.3.1.7 Buffalo River Habitat Restoration Project - This collaborative effort between the City of Buffalo and the USEPA aimed to restore the Buffalo River natural habitat as well as provide public access to the urban waterway. The main goal of this project was to improve fish and wildlife habitat on five parcels along the Buffalo River while providing public access for activities such as fishing and nature walks. Construction of three of the sites was completed in October of 1997, and the fourth (Seneca Bluffs) was completed in 2005.

- **Ohio Street Boat Launch** - This parcel (approximately 2 acres) was developed by NYSDEC as a launch area for The Buffalo River Urban Canoe Trail. The Habitat Restoration Project allowed for replanting of native vegetation and constructing public access facilities.
- **Smith Street** - This 3.7 acre site was once a small-debris and stolen-can dumping ground at the foot of Smith St. Restoration efforts began in the spring of 1997 and involved the reconstruction of a backwater

wetland similar to those which formerly line the waterway before industrialization occurred. Excavated material from the Buckhorn Marsh in Grand Island, NY was brought in as the seedbed fill and substrate for the wetland to ensure the growth of native wetland plant species. Underwater log habitats were placed offshore to improve aquatic species habitat and an in-water rock reef was placed to create a riverine wetland. Extensive native plantings were placed throughout the parcel. The site also provides public access through a fishing overlook, a canoe docking area, and interpretive nature trails.

- **Bailey Avenue Peninsula** - The largest and most natural of the three sites, this 3.8 acre area is located at the confluence of the Buffalo River and Cazenovia Creek and required the least amount of change through construction as it was already primarily a wooded site. Restoration efforts enhanced shoreline softening along the edge of the peninsula which was complemented by anchor habitat logs near the shoreline to improve fish and shorebird habitat. Public access was improved by upgrading the existing trail system and construction interpretive signage at the shoreline as well as a river overlook.
- **Seneca Bluffs Natural Habitat Restoration Project** - This 15 acre floodplain area is located on the Buffalo River near the Seneca Street Bridge. Restorations include restoring and enhancing habitat for fish and birds, controlling pollution, and creating areas for safe fishing and walking trails.

3.3.1.8 Buffalo River Urban Canoe Trail – the Buffalo River Urban Canoe Trail Guide was developed by NYSDEC to promote recreational activities in the Buffalo River. This self-guided trail begins above the AOC at the NYSDEC Harlem Rd. Access Point and continues downstream to the Ohio St. Access Site. This trail allows for a view of the River and surrounding areas that is not easily viewed from other vantage points.

3.3.1.9 Brownfield Opportunity Areas (BOA) – Under the Brownfield Opportunity Areas Program, the New York State Department of Environmental Conservation, in partnership with the NYS Department of State, provides financial and technical assistance to municipalities and community-based organizations. Funding can be used to complete revitalization plans and implementation strategies for area affected by the presence of brownfield sites, as well as site assessments for strategic sites.⁴ Two BOAs adjacent to the Buffalo River have received funding as of 2008.

- **South Buffalo BOA** - The City of Buffalo was awarded a significant grant to conduct a Nomination Study for the South Buffalo Brownfield Opportunity Area (BOA). The Nomination Study will be an in-depth analysis and masterplan for approximately 1,800 acres of strategically located, but largely underutilized land in South Buffalo (proximate to the Lake Erie waterfront, the Buffalo River and along major transportation infrastructure including New York State Route

⁴ NYSDEC website.

5). The South Buffalo BOA is a project that is crucial to the renaissance of Buffalo, and important for charting the reclamation and redevelopment of these valuable lands. The City of Buffalo has retained the expertise of environmental, land use, and economic consultants to formulate the South Buffalo BOA Step 2 Nomination Document in consultation with municipal staff, elected officials, local, state, and federal agencies, and non-governmental stakeholders including community organizations, landowners, and developers. The process will include extensive community involvement intended to solicit feedback and participation from the community. The study process is anticipated to run from November 2007 until March 2009.⁵ The BOA contains properties that are located between the Buffalo River and the Lackawanna line and include a mix of heavy industrial, commercial, and residential uses and formerly served heavy steel manufacturing industries that operated from approximately 1900 to 1982.⁶

- **Buffalo River Corridor BOA** – Buffalo Niagara Riverkeeper, in a joint application with the City of Buffalo Office of Strategic Planning received a BOA grant in May 2008 for a 600+ acre section of the City that includes the north bank of the Buffalo River Corridor. Similar to

⁵ City of Buffalo Office of Strategic Planning website.

⁶ City of Buffalo Office of Strategic Planning. 2005. Proposed Brownfield Opportunity Area; Proposal Requirements and Scope of Service.

the assessment and analysis of the South Buffalo BOA, the “Buffalo River BOA” will commence in late 2008.

3.3.1.10 Elk Street Revitalization and Planning- The Buffalo Urban Development Corporation is overseeing small scale planning effort, funded in part by Honeywell and Exxon Mobil, to prepare a vision and long-term plan for revitalization of the Elk Street corridor once the Voluntary Brownfield Clean-ups are complete.

3.3.1.11 Buffalo River Greenway Implementation- On behalf of the City of Buffalo, Buffalo Niagara Riverkeeper received \$390,000 for implementation of sections of the Buffalo River Greenway. Work is expected to begin in late 2008, and will include construction of the Valley Community Association’s Buffalo Riverfest Park, assessment of the foot of Hamburg Street for public access, and the hiring of a Greenway Coordinator to oversee the acquisition/protection of numerous parcels along the Buffalo River within the City of Buffalo.