

Case Study 8

Buffalo's rebirth as the "Queen City of the Great Lakes"



*The Buffalo River: from a severely degraded waterway
to one of Buffalo's greatest assets*

Buffalo River Cleanup Improves Buffalo's Ecological Health, Economy & Public Spaces

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During the 1800s, the City of Buffalo, New York, and the Buffalo River were well known as the terminus of the Erie Canal, which connected the Hudson River near Albany, New York, to Lake Ontario at Buffalo. At the time, the city was the grain storage capital of the world, as well as the world's fourth largest port, earning Buffalo the title of "Queen City of the Lakes." Soon railroads would follow and flourish because of Buffalo's strategic location, its critical role in moving people and goods, and early advantages from hydropower provided by Niagara Falls.

By the 1900s, Buffalo would attract numerous industries, including automotive, steel, chemical, and oil, and become a thriving hub for retail and wholesale distribution. By the 1940s, both industrial and municipal effluents were overwhelming the Buffalo River. The 1960s became a decade of environmental awakening, including in 1968 when the Buffalo River caught fire. During this time a Buffalo conservationist named Stanley Spisiak helped

raise public awareness of severe water pollution of the Buffalo River and Lake Erie and eventually convinced government officials to reduce and control the indiscriminate release of industrial pollutants into these waters. The environmental awakening occurring across the country led to the establishment of Earth Day in 1970, the Clean Water Act in 1972, the U.S.-Canada Great Lakes Water Quality Agreement in 1972, and the Endangered Species Act in 1973.

Then in the 1980s, Buffalo's economy was impacted by a recession that resulted in the closure of many industries, lessening the impact on the Buffalo River. The community began to envision a post-industrial future with a cleaner and more natural river.

Buffalo River Remedial Action Plan

In 1985, the International Joint Commission identified the Buffalo River as one of 42 Great Lakes Areas of Concern (AOCs). State and

federal governments committed to developing and implementing a remedial action plan (RAP) to restore all beneficial use impairments. The combined Stage 1 and 2 Buffalo River RAP (i.e., problem definition and causes, remedial actions and responsibilities) was completed in 1989 (New York State Department of Environmental Conservation [NYSDEC], 1989). The Stage 2 RAP addendum was completed in 2011 (Buffalo Niagara Riverkeeper, 2011) and updated periodically thereafter. Nine beneficial use impairments were identified: *restrictions on fish and wildlife consumption, tainting of fish and wildlife flavor, degradation of fish and wildlife populations, fish tumors or other deformities, bird or animal deformities or reproductive problems, degradation of benthos, restrictions on dredging activities, degradation of aesthetics, and loss of fish and wildlife habitat*. From the late 1980s through the early 2000s, the NYSDEC served as the RAP coordinator, with significant public participation and input from a Remedial Advisory Committee. In 2003, the Buffalo Niagara Waterkeeper

(previously known as Riverkeeper) was the first nonprofit organization in the Great Lakes selected to re-energize the RAP process, coordinate implementation, and catalyze further progress.

Implementation of RAPs through the U.S. portion of the Great Lakes took a major step forward with the passage of the Great Lakes Legacy Act (GLLA) and the Great Lakes Restoration Initiative (GLRI) in 2002 and 2010, respectively. These funding authorities provided tools for local communities to secure cost-share agreements and provide a vehicle for public-private-nonprofit collaboration. Through GLLA and GLRI, priority was given to remediating contaminated sediments and restoring habitats in Great Lake AOCs. Further, the rate of sediment remediation and habitat restoration, the removal of beneficial use impairments, and the delisting of AOCs has accelerated since GLLA and GLRI programs were initiated.

For example, the Buffalo River Restoration Partnership was able to remediate 494,562 cubic yards (378,120 cubic meters) of contaminated sediment in 2016 at a cost of \$48.5 million under a GLLA agreement, and 371,994 cubic yards (284,410 cubic meters) of contaminated sediment was removed by the U.S. Army Corps of Engineers in 2012 at a cost of \$8 million through “enhanced navigational dredging.” In



Contaminated sediment remediation in the Buffalo River. Credit: Buffalo Niagara Waterkeeper.



Shoreline habitat restoration along the Buffalo River. Credit: Buffalo Niagara Waterkeeper.

addition, substantial habitat restoration has been undertaken in support of removing *loss of fish and wildlife habitat* as a beneficial use impairment. Since 2012, numerous partners have implemented projects along nearly two miles (3.2 kilometers) of shoreline and 20 acres (8.1 hectares) of habitat

have been restored through GLRI at a cost of more than \$25 million (Table 1).

It should also be noted that the Buffalo Sewer Authority operates a secondary wastewater treatment plant on Bird Island that discharges to the Niagara River and a collection system

of approximately 850 miles (1,368 kilometers) of sewer lines. Since 1985, the Buffalo Sewer Authority has invested more than \$300 million in capital improvements and system upgrades.

The City of Buffalo is served by a combined storm and sanitary sewer system that periodically

Project/Site	Location	Description	Extent of Restoration
Buffalo Motor & Generator Corporation	Between Michigan Street Lift Bridge and River Fest Park	Riparian slope restoration, invasive species removal and management, and upland and riparian habitat restoration	240 feet of shoreline; 0.27 acres
Toe of Katherine Street	Located near 99 Ensign Street	Invasive species removal and management, re-establishment of native vegetation, and shoreline stabilization	805 feet of shoreline; 2.3 acres
Blue Tower Turning Basin	East and south bank of the Buffalo River, 3.1 miles upstream of the river mouth	Installation of vertical pilings and a log boom chain to prevent debris buildup and allow for re-establishment of native vegetation	1,632 feet of shoreline
Riverbend I and II	RiverBend Commerce Park property near South Park Avenue	Riparian slope restoration, invasive species removal and management, and upland and riparian habitat restoration	4,320 feet of shoreline; 9.8 acres
Buffalo Color Peninsula	4.25 miles upstream of river mouth	Stabilization and restoration of shoreline, including construction of vegetated benches	2,575 feet of shoreline
Old Bailey Woods	Downstream of confluence of Buffalo River and Cazenovia Creek	Restoration of riparian slope habitat, upland forest habitat, and in-water habitat	805 feet of shoreline; 3.1 acres
Ohio Street Boat Launch	1.5 miles upstream of river mouth	Shoreline and upland habitat restoration	300 feet of shoreline; 1.25 acres

Table 1. Examples of Buffalo River habitat restoration projects completed with GLRI funding since 2012.

releases untreated and partially treated sewage to the river. The Buffalo Sewer Authority estimates that 379.7 million gallons of wastewater and untreated stormwater enter the Buffalo River during the 69 overflow events in a typical year. Buffalo Sewer Authority's Long-Term Control Plan to control overflows to all of Buffalo's waterways, including the Buffalo River, was finalized in 2014. This system-wide plan is being implemented over a 20-year time-period at a cost of \$380 million. This does not include the more than \$50 million invested by Buffalo Sewer Authority in engineering and previously completed Phase I projects for operational improvements.

As part of this plan, Buffalo is championing both traditional gray infrastructure (i.e., underground pipes, pumps, and storage tanks) and green infrastructure (i.e., living infrastructure that captures stormwater and reintroduces it into the water cycle) solutions. Rain Check 1.0, launched in 2015, was the first generation of green infrastructure in Buffalo. The program tackled the stormwater challenge through four distinct strategies: green streets; green parking lots; demolitions and vacant lot restoration; and rain barrels and downspout disconnections. The next generation of green infrastructure in Buffalo will expand projects, while continuing to prioritize community engagement and education

and establish new partnerships to tackle collaborative projects across the city.

Buffalo River Revival

Considerable progress has been made in restoring the Buffalo River, and this restoration has been accelerated in the last ten years with funding from GLLA and GLRI. Indeed, this river revival is dramatic. In 1968 when the Buffalo River caught fire, there were no fish in the lower river. Today, you can find 25 to 30 species of fish and a substantially improved macrobenthic invertebrate community. Peregrine falcons are reproducing after an absence of more than 30 years. In addition, the recreational use and commercial redevelopment of its shorelines has brought hundreds of thousands of people to a riverfront that was once a dead zone of activity. Contingent upon confirmation of use restoration, the Buffalo Niagara Waterkeeper and NYSDEC project the Buffalo River will be delisted as an AOC in 2022.

Improving Public Access

With the cleanup of the Buffalo River, the City of Buffalo, the Buffalo Niagara Waterkeeper, and many partners began improving public access to the river to improve quality of life and stimulate the local economy. Buffalo formally adopted a local Complete Streets ordinance in 2008.

Complete Streets are best described as *streets for everyone*. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. Complete Streets help create livable communities by making it easy to cross the street, walk to shops, and bicycle to work.

In 2014, Buffalo's Ohio Street was transformed into a complete street with safe access for all users and connections to the river to be a catalyst for revitalization. This Ohio Street transformation was funded with \$8.152 million from the Federal Highway Administration, \$2.038 million from the New York Power Authority via the Erie Canal Harbor Development Commission, and \$1.2 million from the City of Buffalo (Office of Congressman Brian Higgins, 2015).

In 2011, the new three-acre Buffalo Riverfest Park opened along the Buffalo River as a place to go and relax with friends year-round. The park cost \$5.4 million (Office of Congressman Brian Higgins, 2015), with funding from the Wendt Foundation, Dormitory Authority, Greenway Commission, New York State Canal Commission, New York State Parks Department, Department of State, Empire State Development Corporation, and others.

It should also be noted that New York Governor Andrew Cuomo has committed to a

\$1 billion investment in the Buffalo area, called Buffalo Billion, to create thousands of jobs and spur billions of dollars in new investment and economic activity over the next several years. As part of this initiative, Governor Cuomo announced in August 2018 that \$10 million in state funds were awarded to Buffalo Niagara Waterkeeper to establish the “Buffalo Blueway,” a water trail network of public access points along the Buffalo River and other regional waterways.

In October 2018, the Ralph C. Wilson Jr. Foundation committed \$50 million to remake Buffalo’s LaSalle Park into the Ralph C. Wilson, Jr. Centennial Park to improve public access to the lakefront and enhance quality of life. The foundation committed an additional \$50 million to support regional greenway trails in western New York. Concurrently, the U.S. Army Corps of Engineers received \$3.7 million to repair 1,300 feet (396 meters) of seawall on the northern section of this park.

Waterfront Revitalization

Both a cleaner Buffalo River and improved public access to it have contributed to waterfront economic revitalization. In 2008, the Erie Canal Harbor Development Company reopened the Erie Canal Harbor as a historic business district under the name Canalside. Use of the site has grown



Preschool children releasing butterflies as part of habitat restoration along the Buffalo River. Credit: Buffalo Niagara Waterkeeper.

steadily, from 150,000 visitors and 115 events in 2010 to more than 1.5 million annual visitors and more than 1,000 annual events in 2016 (Great Lakes Commission and Council of Great Lakes Industries, 2018).

Buffalo Mayor Byron Brown has been championing economic revitalization that embraces inclusiveness, equity, and opportunity for all. As part of this economic revitalization effort, the City of Buffalo’s Office of Strategic Planning has been tracking waterfront development projects. Between 2012 and 2018,

there has been more than \$428 million of waterfront development along the Buffalo River alone (Table 2).

Concluding Thoughts

The cleanup of the Buffalo River has led to a substantial ecological revival. Public-private partnerships have been essential to this cleanup effort. In recent years, federal funding from GLLA and GLRI has accelerated river cleanup, leading to improved public access to the river and

Project (Developer)	Description	Cost	Year
Mariner Tower (Liberty Affordable Housing)	Development of affordable housing adjacent to Naval Park	\$41.9 million	2012
Business Expansion (The English Pork Pie Company)	Renovation of a building and installation of an automated pot pie production line	\$1.2 million	2012
Buffalo Riverworks (Doug Swift, Earl Ketry, and John Williams)	Development of a waterfront, boating, sports, music, and entertainment complex	\$15 million	2013
Industrial Expansion (PVS Chemicals)	Construction of a 3,725-square-foot addition to their manufacturing plant	\$11 million	2014
Tifft Nature Preserve (Buffalo Museum of Science)	Construction of a 3,930-square-foot expansion and creation of a Sustainability Center	\$775,000	2014
Buffalo HARBORCENTER at Canalside (Pegula Sports and Entertainment)	Mixed-use development, including entertainment and a 12-story Courtyard by Marriott Hotel with 205 rooms	\$250 million	2014-2015
Explore and More Children's Museum (Samuel Savarino)	Construction of a 40,000-square-foot museum at Canalside	\$36 million	2015
Industrial Expansion (Rigidized Metals)	3,600-square-foot expansion of a metals plant	\$3 million	2015
Townhouses at Waterfront Place (Ellicott Development)	Construction of 10 three-story townhouses, plus condominiums	\$20 million	2015
William K's Restaurant (Molly Ford Koessler)	Development of a new waterfront restaurant	\$900,000	2015
Industrial Development (John W. Danforth Co.)	Construction of a 50,000-square-foot facility to expand operations	\$7 million	2015
301 Ohio Street Mixed-Use Development (Ellicott Development)	Mixed use development, including 21 apartments	\$15 million	2016
Buffalo River Landing (Savarino)	Mixed-use redevelopment of former Erie Freight House, including 78 apartments	\$18 million	2016
Infrastructure Improvements by Energy Company (National Grid)	Construction of caisson shafts and tunneling for National Grid infrastructure under the Buffalo River	\$6.8 million	2018
Utility Infrastructure Improvements (National Grid)	Construct electric substation	\$1.8 million	2018

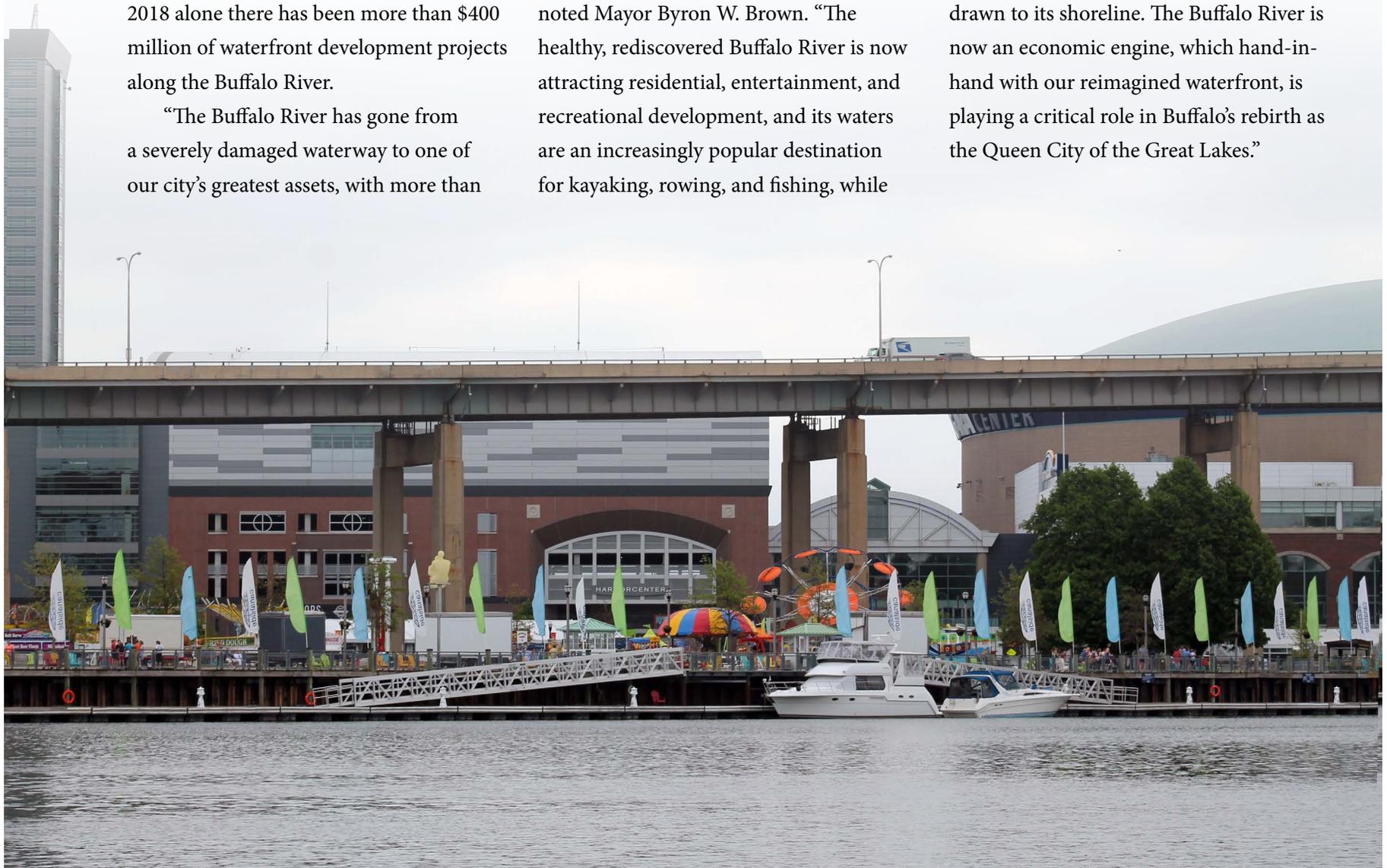
Table 2. A summary of waterfront development projects along the Buffalo River in Buffalo, New York, 2012-2018.

waterfront revitalization. Between 2012 and 2018 alone there has been more than \$400 million of waterfront development projects along the Buffalo River.

“The Buffalo River has gone from a severely damaged waterway to one of our city’s greatest assets, with more than

\$400 million in investment since 2012,” noted Mayor Byron W. Brown. “The healthy, rediscovered Buffalo River is now attracting residential, entertainment, and recreational development, and its waters are an increasingly popular destination for kayaking, rowing, and fishing, while

cyclists, runners, walkers, and birders, are drawn to its shoreline. The Buffalo River is now an economic engine, which hand-in-hand with our reimagined waterfront, is playing a critical role in Buffalo’s rebirth as the Queen City of the Great Lakes.”



RiverWorks sports and entertainment complex along the Buffalo River. Credit: Buffalo Niagara Waterkeeper.

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Cover Photo

Buffalo River restoration has been a catalyst for creating waterfront public spaces in Buffalo, New York. Credit: Joe Cascio.

All monetary amounts are in U.S. dollars.

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The Buffalo River case study is part of a larger project to evaluate achievements and lessons learned from 32 years of efforts to clean up Great Lakes AOCs. Case studies will be used to help sustain support for cleaning up AOCs and to inspire and motivate others to restore other degraded aquatic ecosystems.

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