

Western New York residents know Lake Erie provides the perfect backdrop for glorious sunsets like this one, at the mouth of the Buffalo River.



# RIVER REBORN

## Once-contaminated Buffalo River Spawns Economic Renaissance

By Kristen Davidson, Damianos Skaros, Jane Edgington and Anna Svirgun  
Photos provided by authors

Standing at the river's edge, it's hard to imagine that this 22-foot-deep, 300-foot-wide channel, lined with thick cement walls and surrounded by gigantic grain silos and other reminders of Buffalo's booming industrial past, was originally a quiet, narrow creek. But it was; 225 years ago, the Buffalo River was just a babbling, twisting ribbon of water, a few feet deep and full of fish, plants and wildlife.

In 1819, the river was dredged and widened to allow large boats to transport goods from local industry. The broader and deeper navigation channel spurred local manufacturing and generated regional economic benefits, but would also have significant and lasting impacts. While the region's steel, grain and chemical industries prospered throughout the late 1800s and early 1900s, their operations affected the health and environmental quality of the river.

Before strict state and federal environmental regulations were adopted, local communities and industries discharged and dumped wastes, toxic chemicals and other pollutants directly into the Buffalo River. In addition to degrading water quality and destroying wildlife habitat, the pollutants sometimes changed the

river's water color, and thick oil sheens on its surface led to river fires—which occurred as late as 1968. In effect, discharges of industrial contaminants and sewage transformed the river into a chemical soup.

Conditions continued to degrade over time. By 1928, river water was devoid of oxygen, rendering it incapable of sustaining aquatic life. Without oxygen, the Buffalo River was pronounced biologically dead, and remained that way for decades.

In 1987, the U.S. Environmental Protection Agency (EPA) identified the Buffalo River as one of the most contaminated water bodies in the Great Lakes basin, and designated it an Area of Concern. This classification was an important step for the river's future, because it initiated a series of actions that would turn the tide of the river's environmental health.

In 1989, DEC implemented the Buffalo River Remedial Action Plan, a daunting and extensive assignment to develop a strategy to (literally) revive the river. The first step was to clearly define the river's environmental problems, and identify measures to clean up and restore the river.

The Buffalo River Restoration Partnership played a key role in this effort. This unique public-private-non-profit partnership, including the EPA, the U.S. Army Corps of Engineers, DEC, the Buffalo Niagara Riverkeeper® and Honeywell, advanced plans to address a number of environmental problems affecting the Buffalo River, including contaminated river sediments, poor water quality, a lack of safe public access, and insufficient fish and wildlife habitat. The partnership brought together diverse resources and expertise and developed plans for a comprehensive cleanup and transformation of the river into a beneficial environmental, economic and community resource.

Not surprisingly, repairing the health of this eight-mile “dead” river was no walk in the park. New and improved environmental policies, and regulations on wastewater and stormwater discharges helped improve the river water’s oxygen levels and prevented additional degradation. In addition, a remedial action plan was developed to address sediment contamination, and a vast and diverse environmental habitat design was proposed to reestablish aquatic habitat along a six-mile stretch of the river.

Because the vast majority of contaminants had settled into the river sediments, the only viable cleanup option was to mechanically dredge the sediments to remove contaminants. Dredging began in 2011, and continued 24 hours a day, 6 days a week. This major project was completed in 2014, removing one million cubic yards of contaminated sediment from the river floor—equivalent to approximately 100,000 truckloads. During this remediation, barges and cranes could be spotted day and night on the river, dredging up the remains of a century-and-a-half of pollution and neglect. At the height of this \$44 million project, cranes were lifting up to 10 tons of contaminated soil from the river per minute.



Dredging and capping contaminated sediments in the City Ship Canal, which connects to the Buffalo River, helped restore crucial aquatic habitat for fish, birds and other wildlife.



Downtown Buffalo as seen from the mouth of the Buffalo River.

## A Day in the Life of the Buffalo River

Each fall, staff from DEC’s Reinstein Woods Nature Preserve in Cheektowaga team up with volunteers, local environmental organizations and educators to offer a “Day in the Life of the Buffalo River.” This unique, hands-on experience offers middle school and high school students a rare opportunity to learn about the river system, its watershed, and local ecology.



During the event, students collect scientific data; they measure water quality parameters like clarity and chemistry, and investigate aquatic wildlife and habitat. DEC experts provide guidance and training, and help teach the students the importance of having relevant data to understand and protect the overall health of the river. Data is posted online so participants can compare their results with data from other sampling sites and from previous years.

Local teachers and volunteers receive training and supplies to create an exciting learning experience for their students. Check back next summer for updates on how you can help contribute to the future of the Buffalo River.



Along with the dredging, an underwater environmental “cap” was placed on sediments of the adjacent 1.4-mile waterway known as City Ship Canal that connects to the main stem of the Buffalo River. This five-acre cap isolates contaminants and creates valuable habitat for fish and wildlife.

Although it provides significant environmental benefits, dredging has a downside: it removes everything, including sediment, contaminants, slag, and litter, but also aquatic plant life and natural habitat as well. So, after dredging eliminated most of the contamination—including high levels of harmful toxins that once lined its sediments—it was time to reintroduce much-needed aquatic vegetation, basically starting from scratch.

In 2015, Great Lakes Restoration funding was used for restoration efforts along a two-mile stretch of shoreline and in-stream habitat. Natural fish-sheltering structures were scattered in the shallow water near the river’s edge and 80,000 native plants were installed to reestablish critical habitat in the newly restored river.

Habitat restoration is expected to improve fishing along the river and in Lake Erie. The aquatic vegetation offers protection for young fish, allowing larger populations of fish such as walleye, bass, bullhead and trout to once again thrive in the river and eventually populate Lake Erie.

“We start with plants, because plants are the base of the ecologic pyramid. Once a healthy plant population is established, fish and wildlife can thrive,” explained Timothy DePriest, a DEC habitat specialist. He noted that tree seedlings have also been placed along the river’s edge to hold soil together, reduce erosion, and eventually provide all-important shade on the river to keep the water cool and full of dissolved oxygen.

“Nature is resilient, and we have a good chance of restoring a successful ecosystem,” DePriest said. “Remember, this river was dead not that long ago, and if you look at where it is now,



Kayaking and other recreational activities at Buffalo RiverFest Park provide opportunities to explore and enjoy the restored river, amidst a backdrop of Buffalo’s industrial history.



Restoration of the river has brought people back to the area for activities and events, such as those at Canalside. Visit [www.canalsidebuffalo.com](http://www.canalsidebuffalo.com) for more information.

the improvement is remarkable.” As proof, he cites the fact that in the early 1960s, not a single fish could be found in the Buffalo River. Just 20 years later, DEC identified more than 20 fish species in these waters. “The river has proven it is more than capable of a comeback,” he noted.

The Buffalo River restoration project has revitalized a once-neglected waterway, and has generated optimism throughout the city and the region. A cleaner, healthier river has helped spur an economic renaissance, as communities, residents and tourists rediscover a now vibrant waterfront. Sites like Canalside ([www.canalsidebuffalo.com](http://www.canalsidebuffalo.com)), a popular boardwalk park on the city’s inner harbor, offer a variety of year-round events and activities, from kayaking, fishing, ice skating and boat tours, to free concerts, exercise classes and breathtaking views of a newly restored waterway. Single events at Canalside attract up to 15,000 people to the waterfront, and that number continues to grow.

In retrospect, the restoration effort has been a boon for the environment and the entire area. The efforts of various governmental agencies and the Buffalo Niagara Riverkeeper® have truly restored the river. The physical size of the project was extensive, but its environmental, cultural and economic impacts are immeasurable. It clearly shows how a clean, accessible environment can transform a community, creating new opportunities for residents and visitors, and generating economic benefits.

If you have a chance, take a trip to the river. See the renaissance and enjoy everything the restored Buffalo River has to offer. Clearly, this little creek has come a long way.

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The Edward M. Cotter fireboat (and winter icebreaker/water rescue vessel) on the Buffalo River. Built in 1900, the “Cotter” is a National Historic Landmark and the nation’s oldest active fireboat.



# Buffalo Niagara Riverkeeper

In 1989, a group of local citizens formed the “Friends of the Buffalo River” to protect areas along the river from further industrial harm and promote habitat restoration. The group eventually expanded its scope to include the Niagara River, and changed its name to the “Friends of the Buffalo Niagara River.”

In 2003, the EPA designated the “Friends of the Buffalo and Niagara River” as the Buffalo River Remedial Action Plan coordinator. In this role, the organization, which later changed its name to the Buffalo Niagara Riverkeeper, was the lead agency working with DEC and other partners to identify and implement projects to improve the health of the river. In addition, the Buffalo Niagara Riverkeeper was charged with developing monitoring protocols to track and address issues that negatively impacted the river and its resources, including fish and wildlife, water quality and public use.

For more than a quarter of century, the Buffalo Niagara Riverkeeper has played an active role to protect regional water quality and connect people to water resources. The organization’s core activities focus on cleaning up pollution in waterways, restoring fish and wildlife habitat, and enhancing public access to rivers, streams and the Great Lakes through greenways that expand parks and open space.

## Riverkeeper offers a number of programs, including:

**Riverwatch:** Trained volunteers use the latest technology to gather water quality data (pH, turbidity, dissolved oxygen levels, etc.) to assess, maintain and restore healthy waterways.

**Living Shorelines:** This program restores shoreline areas to their natural form that supports a sustainable, resilient and higher-functioning ecosystem. These efforts create functional, beautiful and healthy shorelines, improve water

quality and habitat, and enhance recreational access.

The **Young Environmental Leaders Program (Y.E.L.P.)**: Public high school students from underserved communities can explore current local environmental issues that disproportionately affect their communities. Students undertake a science-based curriculum and examine topics such as environmental justice and efforts of the region’s emerging Blue Economy.

*Authors’ note: Congratulations to the Buffalo Niagara Riverkeeper, recipient of the International River Foundation’s Thiess International Riverprize in 2016. This prestigious environmental award recognizes efforts that have made a difference in protecting, reviving and restoring the world’s rivers, and supports organizations that “have developed and implemented outstanding, visionary and sustainable programs in river management.”*