

# RETURN OF THE RAPIDS: COULD THE UPPER MISSISSIPPI RIVER RUN WILD AGAIN?



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Boulders and whitecaps surround me. My kayak feels unsteady at best, a mere toy in the hands of Mother Nature. I secure my helmet a notch tighter and grip my paddle with adrenaline-fueled super-human strength. I've never whitewater kayaked before, but I'm determined to learn. And what better place to do so than my hometown of Minneapolis, Minnesota?

Fighting against the surging rapids of the Mississippi River, I struggle to control my kayak as I careen past Guthrie Theater. The rental company advised me to drop in at the Bohemian Flats, just past the 35W Bridge, but I want to see as much of the Mississippi River Gorge—the eight-mile stretch from St. Anthony Falls to Fort Snelling State Park—as possible (Figure 1). But there's no time to look around now. All my focus is on steering clear of boulders and staying upright.

Suddenly, a mile has passed. The river calms a bit as I near the University of Minnesota, walled in by the newly expanded East and West River Flats. Islands tall with trees and schools of massive sturgeon appear. Picnickers and hikers dot the park land. Eagles and osprey circle overhead. Herons and fishermen stand in the shallows.

Fellow kayakers and rafters join me as we navigate our way under the Franklin Avenue (Figure 2) and Lake Street–Marshall Avenue (Figure 3) bridges toward St. Paul, to where US Lock and Dam 1 used to be. The concrete wall and towering lock that controlled the river for over a hundred years are gone now; their remnants serve as reminders of the not-so-distant past.

This idea—restoring the rapids to the Mississippi River Gorge—is an exciting prospect, to be sure. The rapids would be

the only ones on the entire current day Mississippi River, made even more unique by their cosmopolitan location. Opportunities for recreation would abound. Flora and fauna would proliferate. Native species not seen in this portion of the river for decades—Paddlefish, sturgeon, Blue Sucker, certain mussels—would return. Asian carp would have natural competitors in said Paddlefish, and would be deterred from swimming upstream by the fast-flowing rapids and remaining 49-foot-tall Upper St. Anthony Falls Lock and Dam. (“Asian carp are notoriously poor swimmers,” says

Peter Sorenson, professor of fisheries, wildlife, and conservation biology at the University of Minnesota, and lead researcher on invasive carp biology and management.)

As of right now, though, this is all speculation—a hypothetical picture of what the Mississippi River could look like if her rapids were restored (Figure 4). Such a feat would require removing US Lock and Dam 1 (née Ford Dam) (Figure 5) and Lower St. Anthony Lock and Dam, dredging some 1.5 million cubic yards of sediment, and reinstalling the limestone boulders that were long ago removed to improve navigation. It's a lot, but it's not impossible.

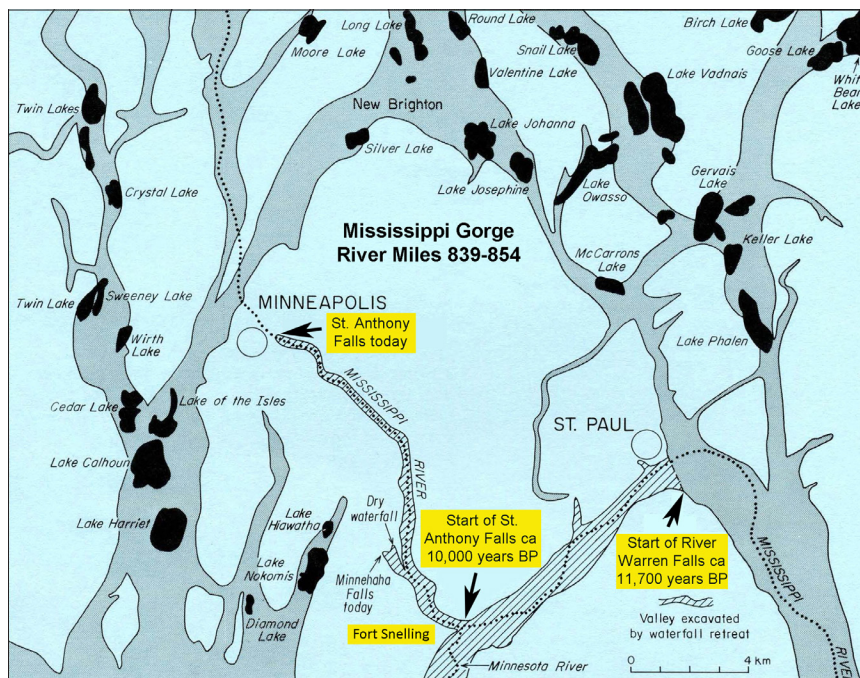


Figure 1. Chronology of Mississippi River gorge. Modified from *Geologic History of Minnesota Rivers*. Minnesota Geological Survey Educational Series 1990 by Wright, H. E., Jr.

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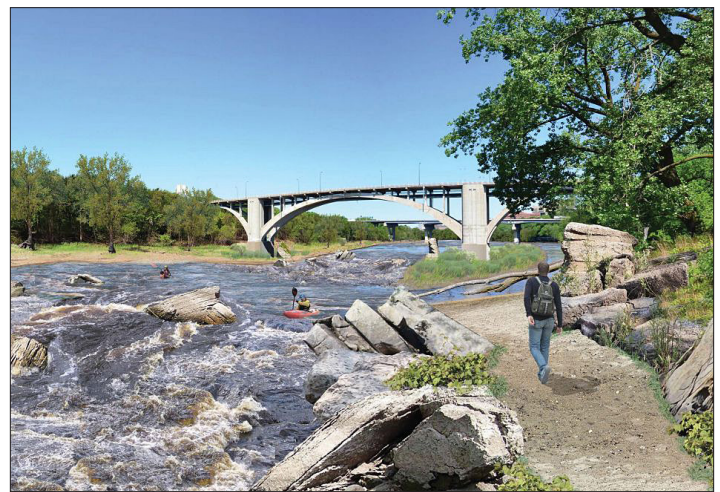


Figure 2. Left: present-day impounded Mississippi River Gorge below Franklin Ave bridge. (Photo by Konrad Schmidt) Right: computer generated image (CGI) near same location if US Lock and Dam 1 is removed. Illustration by John Koepke, Samuel Geer and Michael Keenan, faculty of the Department of Landscape Architecture, University of Minnesota.

Since the closing of the Upper St. Anthony Lock and Dam on June 10, 2015, there has been much discussion about what could be done with the Mississippi River Gorge. Articles have speculated about what restoring the rapids could mean for the Twin Cities, geographically and economically. Ecologists have begun looking into how removing US Lock and Dam 1 would impact their species of choice. And groups like American Rivers, a non-profit dedicated to protecting and restoring wild rivers, have begun seeking funding for research that would answer the million-dollar question: Could the Mississippi River's rapids be restored? And, if so, should they be?

"This is not a new discussion," says Olivia Dorothy, associate director of the Upper Mississippi River Basin for American Rivers. "The community has been talking about the value of this unique ecosystem and how it's been hurt by the locks and dams for a long time. But is it feasible to return the river to its natural state? We just don't know. It's very much a dream, but it's also very hypothetical at this point. We think it's possible, but we can't propose a plan until we have a plan."

But creating a plan requires research and research requires money. For entities like the National Park Service and US Army Corps of Engineers (USACE), it also entails obtaining Congress' blessing. "A lot of people see us as being averse to these things, but we take action based on what Congress dictates," says Patrick N. Moes, public affairs specialist for USACE, St. Paul District. "I want what's best for the river, too. I grew up in Hastings. I grew up mesmerized by the Mississippi River. We're working collectively where we can, but it would be better if there were other avenues to explore. But right now, there aren't."

Ecologists and river experts also face obstacles. Dr. Chris Lenhart, research professor at the University of Minnesota, and Dr. Sorensen, invasive carp specialist, are currently seeking \$221,000 for their Mississippi River Gorge Restoration Planning & Assessment Project. The project would span from 2017–2019 and research such things as sediment toxicity, the potential impacts of water level and riverbed elevation, fish passage, whether river velocities and distances would stop invasive



Figure 3. Left: present view upstream of Lake Street bridge. (Photo by Konrad Schmidt) Right: CGI image (same credit as above).





**Figure 4. Left: St. Anthony Falls and head of gorge in 1857, by Ferdinand Reichardt. Right: Today. (Photo by Konrad Schmidt)**

carp movement, and where vegetation and parkland could be restored. The project would be a crucial step toward knowing what might happen if the rapids were restored, and it's already backed by a wide array of intellectuals and experts.

"As the benefits of gorge restoration are made clear to the public and the potential issues are addressed, the likelihood of restoring the gorge will increase," the proposal states. "If successful, the gorge restoration could begin in the near future."

But without funding, it's just a plan for a plan.

Mike Davis, program consultant for ecological and water resources for the Minnesota DNR, agrees that the potential benefits of a restored Mississippi River Gorge are many. Over the years, Davis has worked on numerous projects involving the restoration of the gorge. He's given presentations, written proposals, and brainstormed hypothetical outcomes: Mississippi Gorge Regional Park, St. Anthony Falls International Kayak Competition, a giant sturgeon fishing contest.

But even Davis acknowledges that nothing about the concept is simple. "The potential benefits in terms of ecology and recreation are great," Davis says. "But the economics need to be considered."

Currently, the Corps employs 13 staff members to tend US Lock and Dam 1 and the Lower and Upper St. Anthony Falls locks and dams (the Corps is still required to maintain Upper St. Anthony, in case of flooding). Average operating costs are \$1.95 million per year. On the other hand, the cost of dam removals varies widely; every project involves a unique set of circumstances. These include such things as whether or not a hydropower company would need to be relocated and/or bought out; sediment toxicity levels; the size of the structures; whether barge traffic would be affected (most experts agree it wouldn't be here, as barges no longer travel north of downtown St. Paul on the Mississippi); and what the restoration process would entail.

Removing a major dam isn't a new idea: 185 dams have been removed in the United States since 2013, including the largest dam-removal project in the world—the Glines Canyon and Elwha dams, in Washington—in 2014. Removing those dams, 120-feet-high and 108-feet-high, respectively, took 20 years of lobbying, planning, researching, and negotiating, and cost \$26.9 million. The questions asked prior to their removal were the same as those currently being asked here: What would happen to all the sedi-

ment? How would native fish species respond? Would local water supplies be affected?

But they did it. From 2011 to 2014, using plans formulated by the world-renowned St. Anthony Falls Laboratory, in Minneapolis, the two dams were disassembled. Sediment was gradually released, water-treatment facilities were constructed, and piece by piece the Elwha River was returned to its natural state. The results were astounding. Redistributed sediment formed new riverbanks, sandbars, wildlife habitat, and 70 acres of beach. Steelhead Trout and salmon began migrating upstream and spawning, which in turn attracted birds eager to eat them and their eggs.

It's estimated that the Elwha River restoration project will cost around \$324.7 million. While the initial expenses may seem hefty, American Rivers reports that most dam removals actually save money in the long run. No dam means no maintenance, safety repairs, staffing costs, or direct and indirect expenses associated with fish and wildlife protection. Plus, subsequent recreation opportunities—fishing, kayaking, rafting—and the businesses they attract can lead to serious economic benefits.

No one knows exactly what it would cost to remove US Lock and Dam 1 and/or Lower St. Anthony Lock and Dam because as of yet no group has received the funding to fully research the hypothetical project. One researcher, however, did look into what the potential economic benefits of the dam removals could be. Using such criteria as the anticipated number of visitors, size of the waterfall, river flow data, visual appeal of the area, and the proximity of two major cities, Steven R. Greseth estimated that a restored St. Anthony Falls and Mississippi River Gorge could bring upwards of \$900 million to the Twin Cities annually.

In addition to economics, something else that needs to be considered when discussing the restoration of the gorge is the fact that the Mississippi River of today looks nothing like the Mississippi River of the early 1800s. A lot has been done to the river in the last two centuries (Figure 6). It might be too late.

Before all the dredging, damming, and rearranging, the river's elevation dropped 111 feet from St. Anthony Falls to where Hidden Falls Regional Park is today. Its path included a narrow gorge, limestone boulders, islands, and wild white-water rapids. Real-estate developer George Merrick described his trip through the gorge in the late 1850s as being "very crooked,





Figure 5. US Lock and Dam 1 (aka Ford Dam) is now closed to commercial navigation. (Photo by Konrad Schmidt)



Figure 6. St. Anthony Falls before European settlement, by George Catlin (1835).

winding about between reefs of solid rock, with an eight- to 10-mile current. White water would pile us up on the next reef below, and the next six miles turned and twisted among the reefs.”

Those rapids have long since disappeared. Ever since the first sawmill was built near St. Anthony Falls in 1821, the Upper Mississippi River has endured the construction of many more sawmills and flour mills, a disastrous attempt in 1869 to build a tunnel beneath the falls (which led to their collapse and subsequent rescue by the USACE), and numerous locks, dams, and other structures that have made it the sediment-heavy, slow-moving beast it is today.

“We’ve modified the river so much that we don’t have natural flows anymore,” says Dr. Brad Perkl, chief archaeologist at the USACE, St. Paul District.

As Alexis C. Madrigal put it in a 2011 *Atlantic Monthly* article: “The Mississippi no longer fits the definition of a river as ‘a natural watercourse flowing toward an ocean, a lake, a sea, or another river.’ Rather, the waterway has been shaped [...] to suit human needs.”

Another complication regarding the restoration of the gorge is figuring out who owns what. “The challenge with the river is that no one owns it,” says Moes, of the USACE. “At the end of the day, Mother Nature will always have the 51-percent vote. But the reality is that within this corridor, you have National Park Recreation Area, the Coast Guard, FERC (Federal Energy Regulatory Commission), and all the natural resource commissions—the Minnesota and Wisconsin DNR, city parks boards. There are a lot of agencies that have a stake in it.”

Adding to that list are the dams’ hydropower-plant owners. Xcel Energy operates the one at Upper St. Anthony Lock and Dam. Toronto-based Brookfield Renewable Energy Group owns both the Lower St. Anthony Falls Hydroelectric Project and the hydropower plant at US Lock and Dam 1; its FERC license at the latter is good through October 31, 2034. Both Brookfield properties would have to be removed along with the dams to get the rapids back, and the company either paid out or moved to new locations. Another option would be replacing Brookfield’s use of hydropower with an alternative green-energy source,

like solar. Each of these outcomes has successfully played out with other hydropower companies around the country, but as of right now, the situation is just another hurdle to consider here in Minnesota.

While Congress would have the final say in closing US Lock and Dam 1 and the Lower St. Anthony, as it did with the closing of the Upper St. Anthony, it’s the public who really holds the power, says John O. Anfinson, superintendent of the National Park Service’s Mississippi River National Recreation Area, and former district historian for the USACE, St. Paul District. “Everything that has happened to this river—every major government levee, every hydropower plant, every navigation project—has happened because people have pushed to make it happen,” Anfinson says. “If they were able to push in the past to make things happen, are we so incompetent today that we can’t do the same?”

Resurrecting the rapids would not be easy. But even with all the unknowns and obstacles, there are just as many, if not more, potential benefits. Instead of 30 feet of sediment and a flooded riverbed, there could be flowing rapids and acres of parkland. Dozens of native species could return. The trickle of leisure boats and occasional kayaker could be replaced by thousands of outdoor enthusiasts from around the world.

Beneath the river humankind has created is the river nature intended. The dams have been in charge of the Mississippi River Gorge for over a hundred years. Perhaps it’s finally time for Mother Nature to reclaim her reign.

## EPILOGUE

The USACE is conducting a disposition study to begin the process of possibly transferring or selling federal properties associated with the three lock and dams. Following public comment on the draft report and environmental assessment, USACE will submit the final report with recommendations to Congress by the end of 2019. Additional information on this study can be found at the following link:

<https://www.fmr.org/news/2018/08/20/corps-study-determine-local-locks-and-dams-fate-questions-about>