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# Boardman River Dam Removals



from **Engineering With Nature: An Atlas, Volume 2.**

by US Army Engineer Research and Development Center



## Traverse City, Michigan, United States

**Returning a river to its original channel.** The Boardman River is a top-quality trout stream; 58 kilometers have Blue Ribbon status, designating the high quality of the water for fish. For over 100 years, four dams on the river impeded upstream migration of the native fishery and created unnatural thermal impacts to aquatic organisms. With the 2012 removal of the Brown Bridge Dam, the uppermost barrier in the system, and removal of the Boardman and Sabin Dams in 2017 and 2018, respectively, the Boardman River Dams Implementation Team, U.S. Army Corps of Engineers (USACE)–Detroit District, and several other partners used primarily Great Lakes Restoration Initiative funding to reconnect 340 river kilometers to Grand Traverse Bay of Lake Michigan. This project also reinstated natural flow, improved aquatic habitat and reestablished a rare cold-water fishery, improving both the mix and population of various species. Additionally, an innovative and unprecedented venture to allow bidirectional selective fish passage at the lowermost barrier, the Union Street Dam in downtown Traverse City, broke ground in 2020 and will be the largest dam removal initiative in the state of Michigan. Repairing a linkage that has been severed

for over a century will guide future efforts in other similarly truncated watersheds in the Great Lakes region.

Article cover: The Boardman Dam removal project as the dewatering phase shifted from the siphon system to the temporary spillway. (Photo by Conservation Resource Alliance and AECOM)

## Producing Efficiencies

Extensive probing documented the location, configuration, and depth of the original channel and adjacent floodplain. The team excavated impounded sediment to reveal the relic river channel and placed the sediment on adjacent upland areas to minimize haul distance while creating wildlife habitat within the river corridor. Sediment traps received sand winnowed from the newly excavated channel, and a siphon system partially dewatered the impoundment, reducing the risk and consequences of dam failure. It also allowed the team to control water surface elevations, making uncovering the buried channel and floodplain more efficient.



Sabin Dam and pond prior to removal.  
(Photo by Brett Fessell, GTB Natural Resources)



Sabin Dam and pond during drawdown.  
(Photo by Brett Fessell, GTB Natural Resources)



Sabin Dam and pond in the last stages of drawdown, following demolition of a majority of the powerhouse.  
(Photo by Brett Fessell, GTB Natural Resources)

## Using Natural Processes

The river restoration included active removal of sediment and nature-based approaches to manage the exhumed river banks. During the project, the river was allowed to adapt to the legacy riverbank and floodplain features to form the new bank boundaries. This created scour pools and depositional features, adding to the habitat's natural complexity. Additionally, engineered wood structures placed at critical locations limit the amount of near-term lateral migration, and the constructed riffles limit incision at key locations. Native plantings minimize maintenance and allow the natural wetland and forest succession to take over.





The restored Boardman River through the former Sabin and Boardman dams and impoundment.

(Photo by Conservation Resource Alliance and AECOM)

## Broadening Benefits

Dam removals traditionally result in increased property values for adjacent landowners. In this case, the removals will additionally result in a large increase in both recreational boating and fly-fishing. Walking paths allow local residents and tourists to explore the sites, providing numerous outdoor education opportunities. The dam removals convert stagnant lake conditions to free-flowing rivers, which benefit fish, macroinvertebrates, mussels, birds, reptiles, amphibians, and mammal species. This also restores the function of the many tributary mouth areas that join with the Boardman River, providing holistic benefits to an entire ecosystem.





The restored Boardman River meandering through the former Brown Bridge Dam impoundment, looking downstream, 7 years postremoval.

(Photo by Brett Fessell, GTB Natural Resources)



A paddler enjoying the restored river in a constructed riffle just downstream of the former location of the Sabin Dam. A 600-footlong pool-and-riffle reach was constructed to overcome the legacy of 1930s-era dredging of the downstream river.

(Photo by Kimberly Balke, Conservation Resource Alliance)

## Promoting Collaboration

In 2005, the Grand Traverse Band of Ottawa and Chippewa Indians (GTB), Traverse City Light and Power, the City of Traverse City, Grand Traverse County, the Fish and Wildlife Service, the Michigan Department of Natural Resources, the Michigan Department of Environmental Quality, and the Michigan Hydro Relicensing Commission joined to form the Boardman River Dams Implementation Team. Working closely with USACE, they guided decommissioning and removal of the Boardman River dams and restoration efforts of the overall riverine ecosystem. Through extensive community outreach, the team ensured the general public was involved and informed.



Fly-fishing for trout in the restored river.

(Photo by Inter-Fluve)



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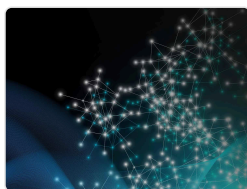
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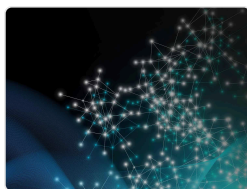
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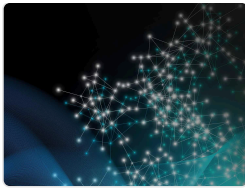
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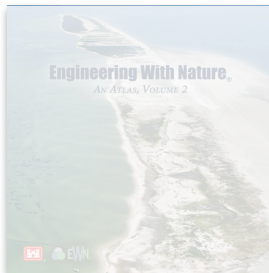
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