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Mill River



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

by US Army Engineer Research and Development Center



Taunton, Massachusetts, United States

Building community consensus to remove four obsolete dams. In the fall of 2005, historic heavy rains in New England threatened the stability of the Whittenton Pond dam on the Mill River in Taunton, Massachusetts. Officials evacuated the City area immediately downstream of the structure due to imminent dam failure. This extreme weather event led to partner collaboration, project planning, and eventual removal of three aging dams and replacement of a fourth dam with a fishway to increase community and ecological resilience of this coastal watershed. In 2012, the team, led by the Massachusetts Division of Ecological Restoration, removed the Hopewell Mill dam, first constructed in 1818. The run-of-the river dam provided no relief from flooding for downstream residents and was the lowermost barrier to river herring migrating to their native spawning grounds. They then removed the Whittenton Pond dam and the West Britannia dam. Finally, the team reconstructed a fourth dam at Morey's Bridge and added a fishway, sustaining recreational activities at Lake Sabbatia while allowing migratory fish to reach upstream natal spawning grounds. These dam removals have reconnected more than 48 kilometers

of rivers and streams linked to Narragansett Bay, benefiting multiple migratory fish species and decreasing community flooding.

Article cover: The Hopewell Dam site after removal and re-meandering, 2016. (Map data from Google Earth)

Producing Efficiencies

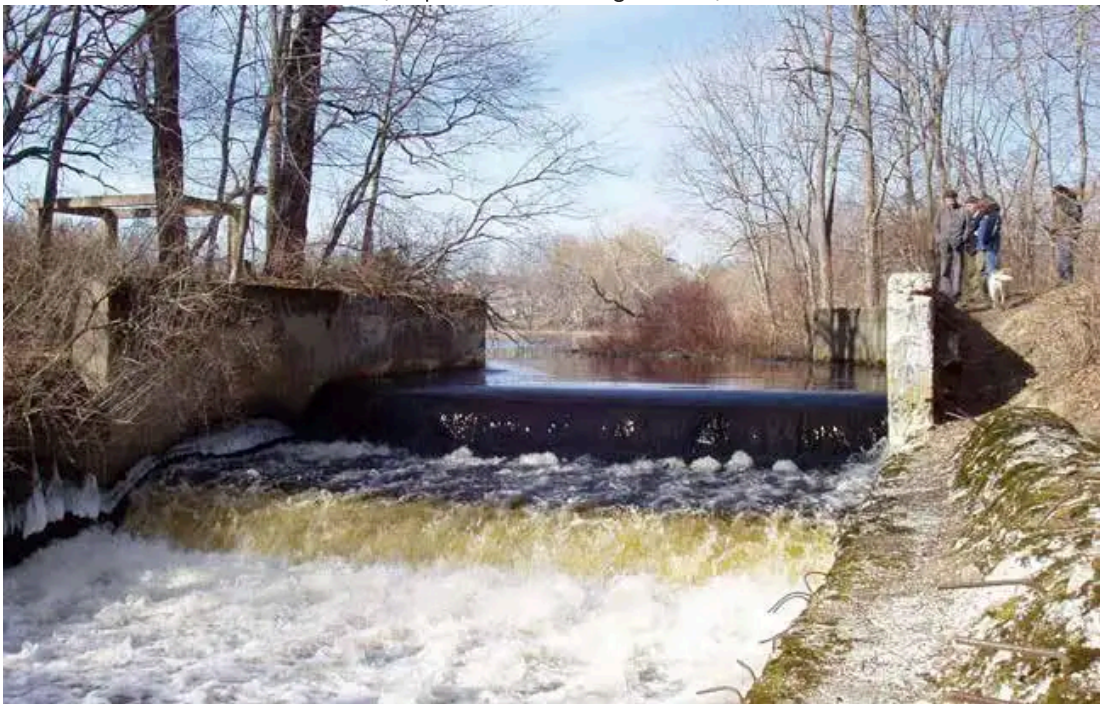
Substantial field surveys combined with digital elevation models, hydrologic and hydraulic analyses, and ecological assessments drove the removal of these public safety hazards, which decreased catastrophic flood risk and reduced operation and maintenance costs. The team also solved a contaminated sediment disposal challenge by removing sediments upriver of the Hopewell Dam. They transported, placed, and capped the materials at the nearby State Hospital property, then converted the area to a wildflower and pollinator meadow. This beneficial use of dredged sediment substantially reduced costs and kept the contaminated sediment out of an upland facility.

Using Natural Processes

The West Britannia Dam removal in 2018 finished the reopening of this waterway restoration for species such as blueback herring (*Alosa aestivalis*), American eel (*Anguilla rostrata*), and sea lamprey (*Petromyzon marinus*). Fish can now swim from Narragansett Bay upstream for more than 80 kilometers to Winnecunnet Pond and its headwaters in the 6,859-hectare Hockomock Swamp. The restoration of the watershed also brought back natural sediment transport, riparian floodplain habitat, and processes supporting this watershed ecosystem. Further, removing the dams decreased the 100-year flood depth profiles of the river by up to 3 meters.



The Hopewell Dam site prior to removal, 2012.
(Map data from Google Earth)



Hopewell Dam prior to removal.
(Photo by James Turek, NOAA Restoration Center)



The Hopewell Dam site in 2017, five years after removal, has a thriving riparian floodplain habitat.

(Photo by Nick Nelson, Inter-Fluve)

Broadening Benefits

The social benefits of reduced flood risk and decreased area within the 100-year floodplain by removing the dams cannot be understated. Additionally, the water quality of Taunton River has also improved—especially important given that the Taunton is a federally designated Wild and Scenic River. With the last dam removal, this was the first time in 200 years that migratory fish could freely pass from the estuary to important upper watershed spawning and rearing habitats. In all, the project has promoted the recovery of vital migratory fish populations in 1,450 square kilometers of watershed.



Demolition of the West Britannia Dam in 2018.
(Photo by James Turek, NOAA Restoration Center)



The Mill River floodplain after the Whittenton Pond Dam removal.
(Photo by James Turek, NOAA Restoration Center)



Sea lamprey in the Mill River upstream of the dam location after the Hopewell Dam removal.

(Photo by Mike Trainor, Massachusetts Division of Marine Fisheries)

Promoting Collaboration

Public outreach and education was important to the project's success; frequent public meetings engaged the community and solicited feedback on the design and implementation over the project's 13-year timeline. The Massachusetts Division of Ecological Restoration led a diverse team, including the City of Taunton, Southeastern Regional Planning and Economic Development District, The Nature Conservancy, Massachusetts Division of Marine Fisheries, the National Oceanic and Atmospheric Administration, private dam owners, and many others. Their longterm strategic planning resulted in the successful restoration of the Mill River watershed.



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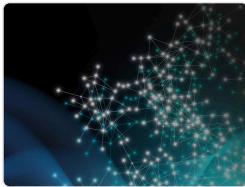
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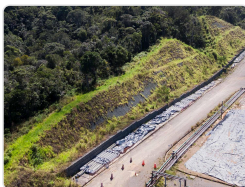
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