American Rivers
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FREE RIVERS

THE STATE OF DAM REMOVAL IN THE UNITED STATES

FEBRUARY 2022

MILL DAM BEING REMOVED FROM THE WATAUGA RIVER, NORTH CAROLINA, JULY 2021.
PHOTO: GAIL LAZARAS, AMERICAN RIVERS

Introduction

The Impact of Dams

Our planet's rivers – our life support system of fresh, clean water – are in crisis. Centuries of dam building, pollution and harmful development have sapped them of their vitality and resilience. In the U.S., only a small fraction of our 3 million miles of rivers remains healthy and free flowing. Few things have such a fundamental impact on a river as a dam, and there are hundreds of thousands of dams with a chokehold on rivers around the country.

Many dams serve an important purpose and should remain in place. However, there are tens of thousands of outdated, obsolete dams nationwide whose impacts to ecology or public safety outweigh the benefits they provide. These dams often threaten public safety, harm Tribal Nations' cultural values and prevent the ability of fish and other aquatic species from migrating, a crucial part of many species' life cycles. Of the more than 90,000 dams inventoried by the U.S. Army Corps of Engineers (only a portion of the total likely number of dams nationwide), it is estimated that roughly 85 percent are older than 50 years, an age when a need for expensive repairs becomes more common. Many, perhaps most, of these aging dams no longer serve their original purpose and are not being maintained; thus, they are in danger of failing, particularly during increasingly severe storm events. In the last few years alone, dam failures or near failures have forced hundreds of thousands of people to evacuate their homes, causing millions of dollars of property damage[1] reported by states in the last decade.

Dams also are a leading reason for the alarming loss of freshwater biodiversity. Seven dams on the Coosa River in Alabama have caused more than thirty freshwater species to go extinct – making it one of North America's worst mass extinctions on record. Also, the once prolific domestic East Coast populations of Atlantic salmon have been nearly destroyed by dams that block access to spawning grounds. On the West Coast, 29 percent of Pacific Northwest and California salmon populations are now extinct and one-third of those remaining are listed as threatened or endangered under the Endangered Species Act.

While hydropower is an important source of electricity and for balancing the grid, hydropower generation and impoundments also release methane, a greenhouse gas that is 25 times more impactful than carbon dioxide over the first 100 years.[2] According to a growing body of academic research, methane emissions from impoundments are substantial and on the rise.

A Movement for River Restoration

Fortunately, a powerful movement is underway to restore healthy, free-flowing rivers by removing dams that no longer serve a purpose or cause more harm than good. Tearing down these barriers restores the natural flow of rivers and allows fish and other species to reach previously blocked habitats. Free-flowing rivers are naturally more resilient to the impacts of climate change.

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[1] The Association of State Dam Safety Officials (ASDSO) indicates that the database is not considered comprehensive and reflects only the data ASDSO has been able to collect. For example, these figures only represent updates made through August 2020 and do not include incidents such as those at the Edenville and Sanford dams in Michigan in 2020.

[2] U.S. Environmental Protection Agency. (n.d) Overview of Greenhouse Gases. https://www.epa.gov/ghgemissions/overview-greenhouse-gases

American Rivers maintains the database on U.S. dam removals. 1,951 dams have already been removed nationwide, with **57 dams removed in 2021 that freed 2,131 miles of rivers upstream**. More than 76 percent of our nation's dam removals have occurred since the removal of Edwards Dam on Maine's Kennebec River in 1999 (Figure 1). The Edwards Dam removal was a turning point because it was the first time the Federal Energy Regulatory Commission ordered a dam removed because its costs outweighed its benefits. The Edwards Dam removal helped turn the once radical concept into an accepted, proven tool for addressing outdated infrastructure and restoring rivers. Today, dam safety offices, fisheries managers, dam owners and communities are taking a second look at the benefits and impacts of dams. Many are deciding that removal is the best option— one that can bring significant benefits to the environment, community and economy.

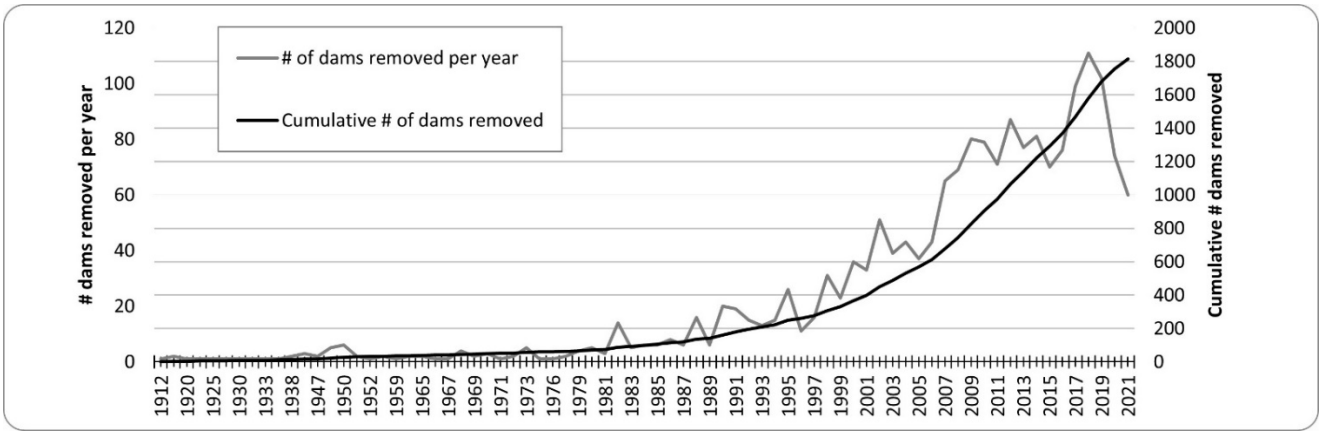


Figure 1. Cumulative number of dams removed versus the number of dams removed per year

What the Numbers Illuminate

Pennsylvania (364 total dams removed) and Wisconsin (152 total dams removed) have long led the country in the removal of dams. A major factor contributing to their success is close collaboration between the state fisheries and dam safety programs. Like many states, these programs are housed in different state agencies. **Intentional efforts to increase interagency communication and partnerships to accomplish their respective missions have resulted in the identification of more opportunities for dam removal and the ability to leverage more state, federal and private resources to assist in the removal of unsafe dams and restoration of important aquatic resources.**

States like Pennsylvania and Wisconsin led the way for dam removal (Figure 2), and other states have answered the clarion call to address outdated dams. For example, Vermont, with just 413 state-regulated dams, has removed 52 dams (13 percent of their inventory compared to Pennsylvania's 11 percent). Vermont's success is due in no small part to the state's commitment to partnership and the years that have been invested in developing relationships and projects through the Vermont Dams Task Force, an interagency and non-profit group focused on addressing aging dams.

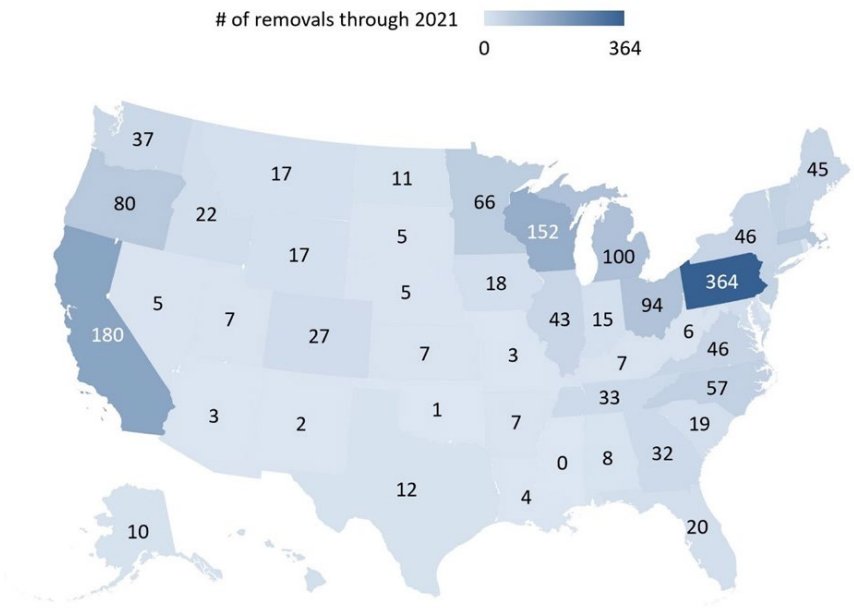


Figure 2. Map of number of dams removed by state from 1912 through 2021

California has significantly grown in the number of dams removed over the last four years, in large part resulting from the work of the Cleveland National Forest and the programmatic approach (known as the Trabuco District Dam Removal Project) they took to remove barriers from U.S. Forest Service land and restore migratory corridors for fish and other aquatic species. Since 2018, Cleveland National Forest has removed 62 dams on Holy Jim, San Juan and Silverado creeks. **This is an important example of how federal agencies should be provided with the funding and staff resources to systematically evaluate dams owned by their agencies to identify those that have exceeded their useful life and where continued maintenance expenses exceed benefits.**

Unfortunately, the more than 1,956 dams removed represents less than two percent of dams in the U.S. Of the dams removed, only 20 percent were dams captured in the U.S. Army Corps of Engineers (Corps) National Inventory of Dams (NID)[3]. The remaining dams removed are indicative of the vast number of largely low-head dams not typically captured in the NID database because they do not meet the dam height, impoundment size or hazard classification criteria established by the Corps. Even among the dams that meet one or more of these criteria, the Corps acknowledges that data is limited by what can be gathered and analyzed with available funding.

A study published in 2015 examined dams and dam removal in New England and found the region's 4,000 dams included in the NID were but a fraction of the more than 14,000 dams found across New England states.[4] Similarly, the Southeast Aquatic Resources Partnership has been working with partners across the country to inventory dams and instream barriers. The Aquatic Barrier Prioritization Tool they created contains 44,815 dams in the nine states that comprise the Great Plains and Intermountain West alone, far more than the number found in the NID.

[3] The National Inventory of Dams was created in response to series of larger dam failures. Congress first authorized the Corps to inventory dams with the National Dam Inspection Act (PL 92-367) of 1972.
[4] Magilligan, F.J., Graber, B., Nislow, K.H., Chipman, J, Sneddon, C.S., and Fox, C. 2016, River restoration by dam removal: assessing riverine re-connectivity and watershed resilience at a regional scale, *Elementa: Science of the Anthropocene*. doi: 10.12952/journal.elementa.000108

In 2002, organizations and agencies involved in the Aspen Institute Dialogue on Dams called for a comprehensive inventory of dams, regardless of size. After almost 20 years, there is real momentum behind the effort. The National Low Head Dam Inventory Task Force is comprised of organizations representing a multitude of interests across the U.S. and is headed by Professor Rollin Hotchkiss of Brigham Young University, Manuela Johnson of the Indiana Department of Homeland Security and Professor Brian Crookston of Utah State University. Organizations such as the American Society of Civil Engineers Environmental and Water Resources Institute, the Association of State Dam Safety Officials and the U.S. Society on Dams are assisting in this nationwide effort to get a true sense of the likely number of dams in the U.S. **Groups like American Rivers and American Whitewater are advocating for a National Low-Head Dam Inventory and Financial Assistance Program through the 2022 Water Resources and Development Act.**

In compiling this report, American Rivers also analyzed dam removal data[5] through the lens of hydropower. Less than three percent of dams removed produced hydropower. While the percentage of hydropower dams that are removed is low, these are often cases where power generation at the site is uneconomical and where electricity can be replaced with wind and solar alternatives at low cost. Notably, there are 133 retired hydropower projects[6] where dam infrastructure remains in the river, creating potential additional opportunities for removal. **The reduction in methane emissions and improved resiliency of the river when removing a dam and restoring the impounded water to a free-flowing system makes dam removal an important strategy for climate mitigation and adaptation**.

The Klamath River is a prime example of how dismantling dams and building climate resilient rivers can go hand-in-hand. Four dams on the Klamath, formerly owned by PacifiCorp, are slated to be removed in 2023 in order to restore salmon runs and improve water quality. A free-flowing Klamath River will better support the river's Tribal Nations and local communities, as rising temperatures threaten resources they depend on. The four Klamath dams produce a nominal amount of power, which will be replaced using renewables, such as new wind energy, and efficiency measures. The hydropower from the Klamath dams should never have been considered "clean" or "green" given the devastation these dams cause to salmon and water quality, and the staggering injustice and harm the dams impose on the river's Tribal Nations. **The Federal Energy Regulatory Commission and other regulators must ensure restoration of the Klamath remains on track to begin in 2023.**

A Future of Free Rivers

President Biden recently signed the Infrastructure Investment and Jobs Act, which includes $2.4 billion for the removal, retrofit and rehabilitation of dams. It's notable that investment for dam removal was included in an infrastructure bill— **acknowledging free-flowing rivers as infrastructure, vital to local economies, public safety and quality of life. It is a sign that we, as a nation, embrace dam removal as an essential strategy for revitalizing our infrastructure and economy and addressing the interconnected challenges of climate change, injustice and biodiversity loss.** At the same time, it is important to improve the safety and environmental performance of dams that remain in place.

[5] To the extent the data was available and verified.
[6] M.M. Johnson, S.-C. Kao, N.M. Samu, and Uría-Martinez, R., (2020). U.S. Hydropower Retired Facilities, 2020. HydroSource. Oak Ridge National Laboratory, Oak Ridge, TN.

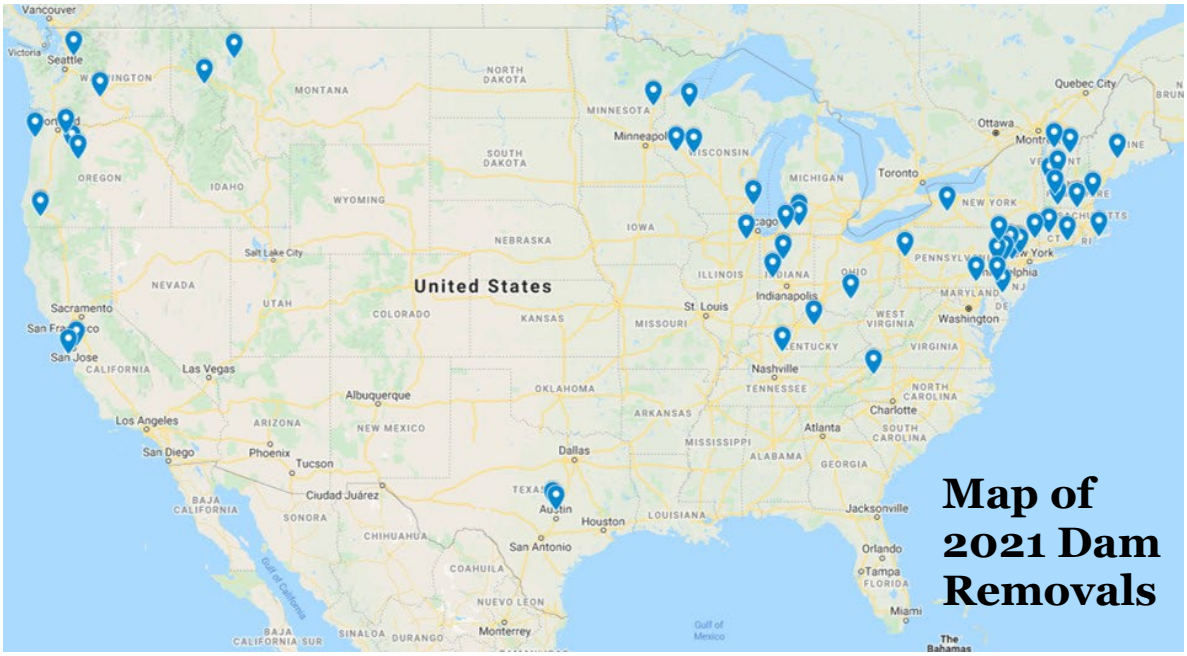
Even as American Rivers and our river restoration partners celebrate progress, there is a tremendous need for more action to remove outdated and unsafe dams. Congress and the Biden administration— in coordination with Tribal Nations and in collaboration with state governments— need to significantly accelerate dam removal efforts nationwide in order to prevent further declines in river health, prevent extinction of fish and wildlife and safeguard the public from failing dams.

Our nation is facing multiple interconnected crises, from climate change, to injustice, to the loss of nature and biodiversity. Rivers flow through these challenges, and river restoration can be a powerful solution.

American Rivers urges Congress to include the 21st Century Dams Act in the upcoming Water Resources Development Act. This will provide programmatic authority and funding authorization for, among other things, the removal of dams with willing owners and funding to increase capacity of state dam safety programs. This is a critical next step in securing our future and the future of those that come after us.

American Rivers imagines a country where everyone has access to clean, safe, healthy rivers; where people don't have to fear being evacuated from their home in the middle of the night because a dilapidated dam is about to fail and where municipal governments can invest tax dollars in community programs rather than patching up outdated infrastructure. We imagine a world where Tribal Nations' spiritual and cultural connection to rivers, water and salmon are honored by bringing Indigenous voices to the forefront and through actions that heal our collective relationship with rivers; where the entire web of life can thrive.

Life depends on rivers, and free rivers work better.



2021 Dam Removal Summary Statistics

- Number of dams removed in 2021: 57 removals
- Number of upstream river miles reconnected in 2021: More than 2,131 miles
- Top states for dam removals in 2021:
  - Vermont, Pennsylvania, and Oregon (all with 7 removals each)
  - New Jersey (6 removals)
  - Wisconsin (4 removals)
- 22 states removed dams in 2021: California, Connecticut, Idaho, Illinois, Indiana, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Texas, Vermont, Washington and Wisconsin

Historical Dam Removal Summary Statistics

- Total number of dam removals from 1912-2021: 1,951 removals
- Years with the highest numbers of dam removals:
  - 2018 (111 removals)
  - 2019 (102 removals)
  - 2017 (99 removals)

The following are highlights of 2021 dam removals (Table 1) and a curated list of dam removal projects to watch in 2022 and beyond (Table 2).

1. Ward Mill Dam, Watauga River, North Carolina
2. Sugar Creek Dam, Sugar Creek, Indiana
3. Red Ives Dam, Red Ives Creek, Idaho
4. Hyde Dam, Second Branch of the White River, Vermont
5. Hammel Woods Dam, DuPage River, Illinois

Ward Mill Dam, Watauga River, North Carolina

Photo Credit: Wildlands Engineering

QUICK FACTS

- Dam Height: 20 feet
- Dam Length: 130 feet
- Year Built: 1890
- Dam Use: Hydropower
- Miles Reconnected: 140 miles

After years of effort to negotiate the surrender of the hydropower license, raise funds, and complete the design and permitting process, the removal of Ward Mill Dam permanently freed and reconnected 140 total miles (25 mainstem miles) of North Carolina's Watauga River. The project improved habitat and river connectivity for several aquatic species including resident trout, green floater mussels (*Lasmigona subviridis*) and the Eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), the largest salamander in the U.S. This project also improved public safety and enhanced recreational opportunities.

The strong partnership and dedication of American Rivers, Blue Ridge Resource Conservation and Development Council, MountainTrue's Watauga Riverkeeper, Buncombe County Soil and Water, Bonneville Environmental Foundation, North Carolina Division of Water Resources, and the U.S. Fish and Wildlife Service enabled this multi-benefit project.

This dam removal was the highest ranked project in the North Carolina Barrier Prioritization Tool, meaning it was the most critical project to complete for river connectivity, landscape condition and presence of threatened and endangered aquatic organisms. It was also ranked in the top 15 percent in the Southeast Aquatic Resources Partnership's regional prioritization (a 14-state region) for watershed condition and connectivity, and in the top five percent in importance throughout the entire region for connectivity alone. The project budget was $350,000.

CONTACT

Erin McCombs
American Rivers
828-649-7887
emccombs@americanrivers.org

Sugar Creek Dam (Crawfordsville Power Plant Dam), Sugar Creek, Indiana

Photo Credit: Ecosystems Connections Institute

QUICK FACTS

- Dam Height: 6 feet
- Dam Length: 200 feet
- Year Built: 1927
- Dam Use: Hydropower
- Miles Reconnected: 611 miles

Built in 1927, this project removed a former hydropower dam that was the last of 11 dams that spanned Sugar Creek, a tributary to the Wabash River in the Ohio River Basin in Indiana. Led by the City of Crawfordsville, the project reconnected 611 upstream river miles of Sugar Creek to the Wabash River for the benefit of smallmouth bass and other resident fish. More than 85 percent of the 74 fish species in Sugar Creek need to migrate up and downstream in the river to complete their life cycles.

The Sugar Creek Dam originally provided power for the Crawfordsville Electric Light and Power Plant. The dam became obsolete in the 1980's when the city switched to another power source for economic reasons. A new solar power project in Crawfordsville produces power equal to that of this dam when it closed.

Sugar Creek is one of the most heavily used steams for recreation in Indiana. Removal of the dam addressed a safety issue, as the structure produced a dangerous hydraulic. At least three people had almost died swimming around the dam and several calls were made to emergency services to rescue boaters, fishermen and swimmers annually.

Project partners included: Ecosystems Connections Institute, City of Crawfordsville, Friends of Sugar Creek and U.S. Fish and Wildlife Service. The project was funded through a grant from the Indiana Department of Natural Resources Lakes and Rivers Program, with in-kind support for hauling of concrete provided by the City of Crawfordsville.

CONTACT

Jerry Sweeten
Ecosystems Connections Institute
260-901-0561
jesweeten@ecosystemsconnections.com

Red Ives Dam, Red Ives Creek, Idaho

Photo Credit: U.S. Forest Service

QUICK FACTS

- Dam Height: 5 feet
- Dam Length: 25 feet
- Year Built: 1935
- Dam Use: Hydropower
- Miles Reconnected: 5 miles

After 20 years of anticipation, Red Ives Dam, a hydroelectric diversion dam on Red Ives Creek in Idaho, was removed from Idaho Panhandle National Forest as a collaborative effort between U.S. Forest Service, U.S. Fish and Wildlife Service, Trout Unlimited, U.S. Department of Interior's Natural Resource Damage Assessment and Restoration Program, and Idaho Conservation League. The dam was originally constructed in 1935 to provide power to a ranger station. However, it had not been used for this purpose in many years.

The project construction encountered some challenges, as a fire compromised the major access road to the site. Fortunately, the project site was not compromised and the concrete and rebar comprising the dam were able to be removed. Further complicating the project were hoot owl (*Strix varia*, also known as barred owl) restrictions for equipment use.

One of the major goals of the project was to reconnect habitat for federally-threatened bull trout (*Salvelinus confluentus*). A tributary within the upper St. Joe River Basin, Red Ives Creek was designated by the U.S. Fish and Wildlife Service as critical habitat for bull trout in 2010. This dam removal will allow bull trout unimpeded access to five miles of upstream critical spawning and rearing habitat.

This project was funded by the U.S. Fish and Wildlife Service, the U.S. Forest Service, Idaho Conservation League, Resources Legacy Fund and the Coeur d'Alene Basin Restoration Partnership.

CONTACT

Ari Cummings
U.S. Forest Service
208-582-8291
ariel.e.cummings@usda.gov

Hyde Dam, Second Branch of the White River, Vermont

Photo Credit: White River Partnership

QUICK FACTS

- Dam Height: 14 feet
- Dam Length: 45 feet
- Year Built: 1930s
- Dam Use: Saw/grist mill
- Miles Reconnected: 34 miles

Hyde Dam was located on Vermont's Second Branch of the White River at the site of a former mill that had a dam as early as the 1700's. Upon completion of the dam removal project, partners will develop the historic site (including an interpretive sign) as a new public access area for angling, swimming and boating.

In 2016, Hyde Dam's owner reached out to the project partners to express interest in selling the dam property. White River Partnership and the Vermont River Conservancy have been working toward dam removal since purchasing the property in 2018. The removal project included measures to protect archaeological resources, removal of sediment upstream of the dam, removal of the dam minus the abutments supporting the mill building, removal of the stacked-stone grist mill foundation, stabilizing the banks upstream, and planting a native tree buffer.

This dam removal reconnected 34 upstream river miles for fish and wildlife, improved water quality and sediment transport, and eliminated a public safety hazard.

This project is part of a larger effort by the White River Partnership to remove six dams in the White River watershed. It also builds upon the momentum of the Vermont Dams Task Force as one of seven dam removals for Vermont in 2021.

CONTACT

Greg Russ
White River Partnership
802-291-3346
greg@whiteriverpartnership.org

Hammel Woods Dam, DuPage River, Illinois

Photo Credit: Chad Merda, Will County Forest Preserve District

QUICK FACTS

- Dam Height: 4 feet
- Year Built: 1930s
- Dam Use: Recreation

The low-head Hammel Woods Dam was removed by the Will County Forest Preserve District from the DuPage River because three people had drowned at this site in recent years. The dam was originally built in the 1930s by the Civilian Conservation Corps to create a pool for summer recreation. However, over time it became clear that the dam was decreasing the health of the river for fish and wildlife and was a hazard to paddlers.

This project builds upon an effort by The Conservation Foundation to evaluate the impacts of dams in the DuPage River watershed. This initiative has identified a number of dams that no longer serve a useful purpose where dam removal could be considered.

The Hammel Woods Dam site is publicly accessible as part of the DuPage River Water Trail. Local residents will be able to put their kayaks into the river and paddle around safely now that the dam has been removed. Project partners included: Will County Forest Preserve District, Lower DuPage River Watershed Coalition and The Conservation Foundation. The Lower DuPage Watershed Coalition, a group of municipalities and park districts along the DuPage River, funded the project.

This project is complemented in the broader watershed by the neighboring Forest Preserves of Cook County who have been working to remove unsafe and ecologically harmful dams on the Des Plaines and North Branch Chicago River in recent years (see our “projects to watch” list below for more information).

CONTACT

Cindy Cain
Will County Forest Preserve District
815-722-5370
ccain@fpdwc.org

Table 1. Reported Dam Removals from 2021

Dam Name	City/County	River	State
Columbine Dam	Santa Clara	Flint Creek	CA
Lower Mill Creek Dam (Unnamed)	Santa Cruz	Mill Creek	CA
Picker Pond Dam (Oxboro Brook Pond Dam)	Montville	Oxoboxo	CT
Roraback Pond Dam	Harwinton	Leadmine Brook Tributary	CT
Red Ives Dam	Shoshone County	Red Ives Creek	ID
Hammel Woods Dam	Shorewood	DuPage River	IL
Logansport Lower Dam	Logansport/Cass County	Eel River	IN
Logansport Upper Dam	Logansport/Cass County	Eel River	IN
Sugar Creek Dam (Crawfordsville Power Plant Dam)	Crawfordsville/Montgomery	Sugar Creek	IN
Elkhorn Dam	Franklin County	Elkhorn Creek	KY
Falmouth Rod & Gun Club Dam	Falmouth/Barnstable County	Childs River	MA
Gulf Brook Dam	Pepperell	Gulf Brook	MA
Sucker Brook Dam	Pepperell	Sucker Brook	MA
Morneau Remnants Dam	Vassalboro/Kennebec	China Lake Outlet Stream	ME
Milham Park Dam	Kalamazoo	Portage Creek	MI
Parkville Dam	Portage	Portage River	MI
Pucker Street Dam (Niles Dam)	Niles/Berrien	Dowagiac	MI
Willow River Dam	Willow River Pine	Willow River	MN
Hall Creek Barrier Dam	Lake County	Hall Creek	MT
Ward Mill Dam	Valle Crucis/Watauga	Watauga River	NC
Lower Peverly Pond Dam	Newington	Peverly Brook	NH
Camp Beisler Dam	Lebanon Township/Hunterdon County	Spruce Run	NJ
Jericho Pond Dam	Stow Creek Township	Stow Creek	NJ
Lake Hartung Dam	Jefferson Township/ Morris County	Russia Brook	NJ
Lake Hudsonia Dam	Morris	Hibernia Brook	NJ
No. 10 Watergate Pond Dam	Hardwick Township/Warren County	Vancampens Brook	NJ
No. 2 Watergate Pond Dam	Hardwick Township/Warren County	Vancampens Brook	NJ
Lower Chia Lin Dam	Stormville	Leetown Brook	NY
Pike Dam	Pike	Wiscoy Creek	NY
Stewart Lake Dam	Ross County	Tributary to Stony Creek	OH
Breitenbush Diversion Dam	Detroit/Marion	Breitenbush Creek	OR
Eagle Fern Dam	Clackamas County	North Fork Eagle Creek	OR
Harboldt Dam	Josephine County	Slate Creek	OR

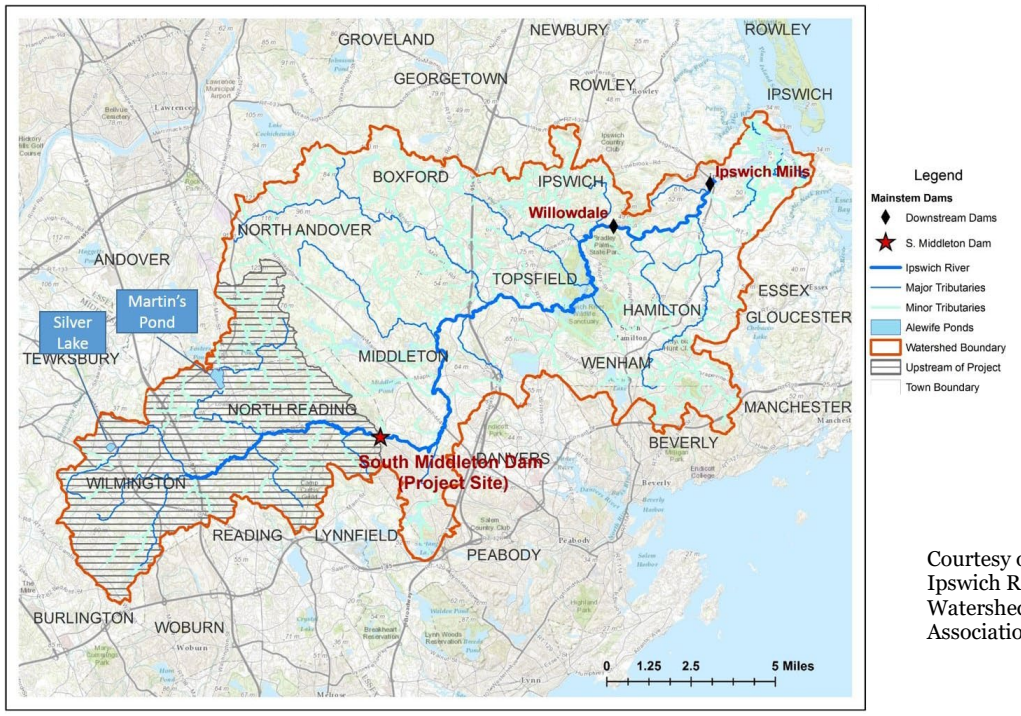
Dam Name	City/County	River	State
Plainview Dam	Sisters	Whychus Creek	OR
South Fork Fish Lake Creek Passage Weirs 1 & 2	Jefferson County	Lake Creek, tributary to Metolius River	OR
Three Rivers - Cedar Creek Weir Dam	Tillamook County	Cedar Creek	OR
Welter Creek Dams #1 and #2	Josephine County	Welter Creek	OR
Aluta Mill Road Dam	Northampton County	Bushkill Creek	PA
Crayola Dam (Water Power Dam)	Palmer Twp, Northampton County	Bushkill Creek	PA
Geigers Bridge Dam	Lehigh County	Tributary to the Jordan Creek	PA
Kehm Run Dam	York	Kehm Run	PA
Lenape Cabin Club Dam	Pocopson Township	Brandywine Creek	PA
O'Conner Reservoir Dam	Jessup	Sterry Creek	PA
Slippery Rock-Wortemburg Pump Dam	West Liberty	Slippery Rock Creek	PA
San Gabriel River Ranch Lake Dam	Williamson	Lackey Creek	TX
Upper Brushy Creek WS Site 10B Dam	Williamson	Tributary Chandler Branch	TX
Browns Mill Dam	West Burke/Caledonia	Sutton River	VT
Dunklee Pond Dam	Rutland	Tenney Brook	VT
Hyde Dam	Bethel/Windsor County	Second Branch White River	VT
Johnson Mill Dam	Bakersfield/Franklin County	Bogue Branch	VT
Lawrence Dam (Guilford Dam)	Guilford	Broad Brook	VT
Montagna Dams 1 & 2	Windham	Turkey Mountain Brook	VT
Nelson Dam	Yakima	Naches River	WA
Pilchuck Dam	Pilchuck	Pilchuck River	WA
Clark County Dam #12	Foster	Hay Creek	WI
Johnston Dam	Grandview	Unnamed Wetland	WI
Kaydo Dam	Caledonia	Hoods Creek	WI
Rock Falls Dam	Rock Creek	Rock Creek	WI

Copco 1 Dam, Klamath River; Photo Credit: Daniel Nylen

Thousands of dams need to come down in the U.S., and there are opportunities for river restoration at every size and scale. American Rivers curated the following list of 25 dam removal projects to watch for in 2022 and beyond which is meant to illustrate examples and highlight opportunities of the types of dam removal projects that exist across the country The "projects to watch" list is not exhaustive. The projects range from small dams with willing owners where river restoration will deliver important local benefits, to bigger dam removal efforts that are vital to saving species from extinction and addressing longstanding injustices across entire regions.

1. Ipswich Mills Dam and South Middleton Dam, Ipswich River, Massachusetts
2. Mahoning River Dams, Mahoning River, Ohio
3. Scott Dam, Eel River, California
4. Snake River Dams, Snake River, Washington

Ipswich Mills Dam and South Middleton Dam, Ipswich River, Massachusetts



Courtesy of the Ipswich River Watershed Association

QUICK FACTS

- # Dam Removals: 2
- Dam Use: Mill
- Upstream River Miles Blocked: 106+ miles

The Ipswich River Watershed Association has been working for years towards the removal of the Ipswich Mills and South Middleton dams on the Ipswich River in Massachusetts. The Ipswich Mills Dam removal project has experienced slow and sporadic progress over more than 20 years because of its delicate location within the heart of historic downtown Ipswich, Massachusetts. As a head-of-tide dam and first significant barrier along the mainstem of the Ipswich River, the Ipswich Mills Dam has interrupted the ecology of the river for almost 400 years. As one of *America's Most Endangered Rivers*® of 2021, the Ipswich River is in dire need of an investment in restoration and conservation. This project would increase the climate resiliency of a river in need and be a triumph and testament to the hard work and dedication of the community, local and state government, and the multitude of organizations who have contributed to advancing this project.

The removal of the South Middleton Dam has been many years in the making, but 2022 promises to be a big year for the project. Ipswich River Watershed Association is partnering with Bostik (dam owners), Inter-Fluve, Massachusetts Division of Ecological Restoration, U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration on what will be the first major dam removal project to take place on the Ipswich River. The removal of the South Middleton Dam will restore connectivity to more than 57 miles of habitat as well as 119 acres of coastal headwater ponds. This project has the potential to be a premier example of the multi-benefit nature of dam removal projects. The majority of necessary permits have been secured, but one final push is needed to finish the permitting and secure the funding required to move to construction.

CONTACT

Neil Shea
Ipswich River Watershed Association
978-412-8200
nshea@ipswichriver.org

Mahoning River Dams, Mahoning River, Ohio

Summit Street Dam; Photo Credit: Jack Pearce [flickr]

QUICK FACTS

- # Dam Removals: 9
- Years Built: 1800's
- Dam Use: Industrial steel mills
- Upstream River Miles Blocked: 30+ miles

The Eastgate Regional Council of Governments and thirteen local communities are working together to restore the Mahoning River in Ohio through a series of nine low-head dam removal projects. These dams were built to provide cooling water for the steel industry that is no longer in business along the Mahoning River. The obsolete structures are now seen as a liability, while a free-flowing river will be an asset to these communities. The Mahoning River Corridor Revitalization Plan re-envisions this river corridor and provides a roadmap for communities to realize a new future for the river. The regional goal to restore the river's free flowing status and improve water quality is echoed by each river community.

The Lowellville Dam was the first dam removal and river restoration project to take place in the Mahoning River. It was the catalyst for subsequent projects that would follow. Lowellville's project involved not only dam removal and stream restoration, but the removal of approximately 10,000 total cubic yards of contaminated sediment left behind by past industrial activities. The remaining dam removals will also need to address contamination from their industrial past.

Remaining dams to be removed throughout the 2020's include: Struthers Dam, Center Street Dam, Mahoning Avenue Dam, Crescent Street Dam, Girard Dam, South Main Street Dam, Summit Street Dam and Leavittsburg Dam.

CONTACT

Stephanie Dyer
Eastgate Regional Council of Governments
330-779-3800 x116
sdyer@eastgatecog.org

Scott Dam, Eel River, California

Photo Credit: California Trout

QUICK FACTS

- Dam Height: 138 feet
- Year Built: 1922
- Dam Use: Hydropower
- Upstream River Miles Blocked: 150 miles

Scott Dam on California's Eel River in Mendocino National Forest is one of two dams that make up the Potter Valley Project. The Eel River is the third-largest watershed in California, traversing Trinity, Lake, Mendocino and Humboldt counties. It was once home to some of the West Coast's most productive salmon and steelhead fisheries. The Potter Valley Project, a hydropower facility that transfers water from the Eel River into the Russian River was built in the early 20th Century. The project now produces very little power and completely blocks fish passage to the Eel River's headwaters.

When PG&E decided in 2020 not to pursue a new license from FERC for the Potter Valley Project, California Trout, Humboldt County, the Mendocino County Inland Water & Power Commission, the Round Valley Indian Tribes and Sonoma County Water Agency decided to protect the region's economy and environment and work together to develop a plan for the future of the project that meets the needs of all communities in the Russian and Eel River basins. Together, they are developing a Two-Basin solution to meet regional water needs while restoring fisheries. However, the current fate of the Two-Basin Partnership is unclear given PG&E's unwillingness to fund any of the studies required for license transfer. Regardless, there is clear scientific proof that the best path forward for the health of the Eel River and for water assurance to the Russian River is to remove Scott Dam.

This project highlights the finite lifespan of hydropower projects and how they can eventually become obsolete. In this case, like many others to come, the effectiveness of the dam has dwindled while other energy sources have become more efficient making it a liability for dam owner PG&E.

CONTACT

Tracey Diaz
California Trout
415-392-8887
tdiaz@caltrout.org

Four Dams, Lower Snake River, Washington

Photo Credit: Carl Zoch

QUICK FACTS

- # Dam Removals: 4
- Years Built: 1955-1975
- Dam Use: hydropower, transportation, irrigation
- Upstream River Miles Blocked: 140+ miles

From 1955 to 1975, the U.S. Army Corps of Engineers built four dams on the lower Snake River – the biggest tributary to the Columbia River – in southeast Washington. The dams – Ice Harbor, Lower Monumental, Little Goose and Lower Granite – have provided hydropower, barge transportation and irrigation benefits to the region, but at a staggering cost. The four dams turned 140 miles of cool, free-flowing river into a series of warm, stagnant reservoirs. The dams disrupt and slow natural river flows, create reservoir temperatures lethal to salmon, and impede salmon migration. The threat posed by the dams is exacerbated by climate change, which is warming up the Snake River and making conditions even more dire for salmon. In spring 2021, researchers with the Nez Perce Tribe Department of Fisheries Resource Management predicted that by 2025, 77 percent of wild Chinook populations will likely have reached "quasi-extinction levels." Scientists believe all four salmon and steelhead runs in the Snake River Basin will go extinct without urgent action. Furthermore, the dams on the lower Snake River are an ongoing source of injustice and the loss of salmon is violating Native American rights ensured by treaty with the U.S. government.

In February 2021, Congressman Mike Simpson (R-ID) proposed a $33.5 billion framework to restore Snake River salmon by removing the four dams. U.S. Senator Patty Murray (D-WA) and Washington Governor Jay Inslee have launched an initiative to examine how to replace the dams' services and will share their findings in July 2022. The four Northwest states and the Biden administration must work together to advance legislation that removes the four lower Snake dams, recovers salmon runs, honors commitments to tribes and invests to replace the dams' benefits.

CONTACT

David Moryc
American Rivers
503-827-8648
dmoryc@americanrivers.org

Table 2. Projects to Watch in 2022 and Beyond

Dam Name	City	State	River	Expected Construction Year
Lake Bella Vista Dam	Bentonville	AR	Little Sugar Creek	TBD
Matilija Dam	Ojai/Ventura	CA	Matilija Creek	2023
Rindge Dam	Malibu	CA	Malibu Creek	2027
Scott Dam	Mendocino National Forest	CA	Eel River	TBD
Searsville Dam	Portola Valley	CA	San Francisquito Creek	TBD
Klamath River Dams: John C. Boyle Dam, Copco No. 1 and 2 dams, Iron Gate Dam	Multiple	CA, OR	Klamath River	2023
Bancroft Mills Dam No. 4	Wilmington	DE	Brandywine River	2022
Rodman Dam	Putnam and Marion counties	FL	Ocklawaha River	TBD
Des Plaines River Dams: Touhy Road Dam and Dam No. 4	Chicago (Multiple)	IL	Des Plaines	2022, 2023
Hickey-Martin Dam	Norman	IN	Henderson Creek	2022
Ipswich Mills Dam	Ipswich	MA	Ipswich River	
South Middleton Dam	Middleton	MA	Ipswich River	2022
Cypress Branch Dam	Millington	MD	Cypress Branch	2023
Walton's Mill Dam	Farmington	ME	Temple Stream	2022
Lower St. Anthony Falls Dam and Lock and Dam 1	Minneapolis-St. Paul	MN	Mississippi River	TBD
Maiden Lane Dam	Town of Cortlandt	NY	Furnace Brook	2023
Mahoning River Dams: Center Street Dam, Crescent Street Dam, Girard Dam, Leavittsburg Dam, Mahoning Avenue Dam, South Main Street Dam, Struthers Dam, Summit Street Dam	Youngstown, multiple	OH	Mahoning River	ongoing
Kellogg Dam	Milwaukie	OR	Kellogg Creek	2023
Chiques Roller Mill Dam	Manheim	PA	Chiques Creek	2023
Oakland Dam	Oakland and Susquehanna boroughs	PA	Susquehanna River	2022
Chattooga River Brook Trout Tributary Dam	Mountain Rest	SC	Pig Pen Creek	2022
Ashland Mill Dam	Ashland	VA	South Anna River	2023
Lower Snake River Dams: Ice Harbor Dam, Lower Monumental Dam, Little Goose Dam, and Lower Granite Dam	Multiple	WA	Snake River	TBD

Dam Name	City	State	River	Expected Construction Year
Powell Dam and Upper Dam	River Falls	WI	Kinnickinnic River	2026
Albright Power Station Dam	Kingwood	WV	Cheat River	TBD

Lower St. Anthony Falls Dam, Mississippi River; Photo Credit: August Schwerdfeger [flickr]

Chiques Roller Mill Dam, Chiques Creek, PA; Photo Credit: Jessie Thomas-Blate

Learn More

Full Database of Dam Removals 1912-2021:
www.americanrivers.org/DamRemovalDatabase

Map of U.S. Dams Removed Since 1912:
www.americanrivers.org/DamRemovalMap

Database of Upcoming Projects to Watch:
www.americanrivers.org/DamsToRemove

FOR DATA INQUIRIES, CONTACT:
Jessie Thomas-Blate
Director, River Restoration
202-243-7030
jthomas@americanrivers.org

FOR MEDIA INQUIRIES, CONTACT:
Amy Souers Kober
Vice President, Communications
503-708-1145
akober@americanrivers.org

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