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FREE RIVERS FOR A RESILIENT FUTURE

Key recommendations from the Dam Removal Funders Symposium

March 2025

FREE-FLOWING RIVERS promote healthy biodiversity, build resilience to climate impacts, and provide clean water to our communities.

But more than 500,000 dams block our nation's rivers. Most were built when there was little understanding of the value of freshwater ecosystems — or the harmful impacts dams have on watershed health, climate, and clean water. Dams are responsible for the extinction of fish and aquatic species, degradation of water quality, emission of greenhouse gases from reservoirs, and increased flood risk to communities. Without immediate action, these problems will accelerate due to climate change.

Many of the nation's dams continue to serve important functions — such as hydropower, water supply, and flood control. But there are many more, often of smaller scale, that are unsafe, serve no purpose, and/or could be replaced with more-efficient and less environmentally damaging infrastructure. These obsolete dams are the focus of our recommendations.

Removing harmful dams is the fastest, most efficient way to restore a freshwater ecosystem, improve water quality, and boost the resiliency of communities facing extreme weather.



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OUR VISION FOR THE FUTURE: ACCELERATING RIVER RESTORATION

Our rivers and the life they support are suffering from a variety of manmade impacts; we must accelerate our work to restore rivers function and advance innovative ideas.

Through 2024, the dam removal community removed 2,240 dams in the U.S. that were doing more harm than good.

By leveraging funding, advancing efforts with Tribal Nations, and training hundreds of professionals to manage projects, we will:

- Dramatically increase the pace and scale of dam removal.
- Build resilience for rivers with increased investment for river restoration through dam removal and dam safety.
- Increase the workforce of dam removal managers and practitioners.

OVERVIEW

Twenty-five years ago, the idea of removing a dam was considered radical, even impossible. Today, it's a proven method for restoring the health of ecosystems, updating our freshwater infrastructure, improving water quality, increasing public safety, supporting local cultures, strengthening economies, enhancing recreation opportunities, and boosting climate resilience.

Momentum for dam removal was accelerated by the Bipartisan Infrastructure Law (BIL) of 2021. A portion of the legislation provided \$3.3 billion for dam and other instream barrier removal, resulting from advocacy by a collaboration of conservation groups, dam safety groups, and the hydropower industry. While providing a tremendous boost to fund river restoration projects, the BIL uncovered the extent of the need and opportunity to remove dams, as applications to federal agencies far eclipsed the available funding.

In spring 2024, American Rivers and Resources Legacy Fund hosted the first-ever Dam Removal Funder Symposium to explore opportunities to increase funding for river restoration through dam removal. The event was attended by 70 leaders representing Tribal Nations, federal and state agencies, private philanthropy, conservation organizations, and other practitioners. Over the course of the two-day event, three calls to action emerged: 1) dramatically increase the pace and scale of dam removals; 2) develop sufficient and sustainable dam removal funding streams; and 3) make community and startup funds available for project development and other underfunded project costs.

This document summarizes recommendations that emerged from the Dam Removal Funder Symposium in these three general areas of focus. It does not represent a full policy agenda but is intended to serve as a discussion document for those interested in helping communities restore and reconnect with their rivers. It provides private and public funders with recommendations to inform strategic planning, development of requests for proposals and funding opportunities, and tactics to support the communities their body of work serves. Dam removal practitioners, conservation and community organizations, and coalitions may also find these suggestions useful when advocating for new funding programs and changes to existing ones.



“Over the last decade, the field has proven the concept that communities can — through river restoration and water infrastructure modernization — more efficiently meet irrigation and municipal water needs, improve safety, and restore rivers to more natural, healthier flows.”

— MICHAEL SCOTT, vice president of conservation, Resources Legacy Fund

American Rivers and Resources Legacy Fund (RLF) are grateful to The Pew Charitable Trusts and the William and Flora Hewlett Foundation for making the Dam Removal Funder Symposium and this report possible. We also acknowledge the contributions of the many funders, corporations, government agencies, and organizations, whose partnerships are critical to the health and future of our watersheds and communities.

1. INCREASE THE PACE AND SCALE OF DAM REMOVALS

Dams can have a devastating impact on communities, public safety, and aquatic species. But rivers are resilient: Once a dam is removed, the entire river system can come back to life, water quality improves, and communities experience a stronger connection to their river, often with increased recreational opportunities and greater resilience to floods and extreme weather.

The practice of removing dams has increased over the last 25 years but must accelerate to meaningfully address the need for improved water quality and river health. Expanding the pace and practice of dam removal will require growing the community of practitioners, supplying adequate training, securing flexible funding sources, and improving regulatory processes and policies at the state and federal level.

KEY RECOMMENDATIONS

- Bolster often-overlooked, early-stage project needs, including project planning, developing preliminary design and engineering plans, working with dam owners, engaging the community, and hiring contractors.
- Improve/clarify regulatory processes and expand efforts to identify and address policy barriers.
- Increase investments in science and research to demonstrate project results, provide tools for regulators and practitioners to make project processes more efficient while maintaining scientific and engineering rigor.
- Provide funding flexibility to cover critical project elements, such as replacing dam function through alternate means, utilities management, post-removal restoration, and monitoring.
- Finance contingency requests to allow projects to continue through unforeseen challenges during implementation.
- Seek opportunities to support projects that are led by or partner with tribes. Direct funds to groups that focus on the needs of the local communities they serve.
- Contribute to efforts that broaden the dam removal workforce.
- Improve communication about dam removal as a transformational tool for ecosystem restoration, climate resilience, and public health and safety.
- Support efforts to grow and diversify the dam removal workforce.



SPOTLIGHT: RAPIDAN DAM, MINNESOTA

In June 2024, torrential rainfall in the upper Midwest and high water levels in Minnesota's Blue Earth River undermined the integrity of Rapidan Dam, which was already in a state of disrepair, causing a partial failure that destroyed a home, playground and endangered downstream communities.

"Climate change is bringing more severe flooding, at a time when our nation's infrastructure is crumbling," said Serena McClain, American Rivers' senior director of dam removal. "There are tens of thousands of obsolete, unsafe dams across the country. The fact that Blue Earth County was aware of the dam's poor condition underscores the need for more dam safety support and funding to expedite the process to remove uneconomical hazardous dams."

2. DEVELOP SUFFICIENT & SUSTAINABLE DAM REMOVAL FUNDING STREAMS

Despite the significant influx of federal funds for dam removal in recent infrastructure bills, those funds are not sufficient for meeting the current demand, much less what is truly needed to address the vast number of our nation's unsafe, economically burdensome, and obsolete dams. According to a 2018 study of historical trends, up to \$25.1 billion is needed to address the U.S. dams that need to be removed by 2050.¹ A more-recent 2023 study² infers that the costs to remove that many dams are likely underestimated, depending on dam sizes and project complexity.

To meet the demand, dam removal funding streams at the federal and state levels must persist year over year and be sufficient to address the significant needs in front of us. Further, public and private funders must continue to develop creative solutions to work in partnership to leverage their funding in ways that provide the greatest economic, community, and ecological benefits.

KEY RECOMMENDATIONS

- Ensure existing dam removal and river-restoration federal grant programs are funded at levels sufficient to address the need.
- Develop private and state mechanisms for efficient, sustainable support to match federal dollars and fund under-supported geographies. Recognize that match or cost-share requirements can exacerbate social inequities and result in less funding going to places with greatest need.
- Develop large, community-focused regional funding programs (e.g., Great Lakes Restoration Initiative; Walton Family Foundation's watershed-focused geographies) and special institutional gifts (e.g., the William and Flora Hewlett Foundation's establishment of RLF's Open Rivers Fund) to complement infrequent large federal bills (e.g., BIL) and ensure the continuity and growth of transformational, basin-scale restoration through dam removal, infrastructure modernization, and other efforts to reconnect river habitat.
- Inspire the private, philanthropic funder community to increase support for dam removal and river restoration.



"We were able to obtain an extraordinary investment from the federal government through the Bipartisan Infrastructure Law. But here's the deal: That funding does not cover portions of the early planning work or prioritization. That's where the private sector can come in. Individuals, foundations, and corporations can provide seed funding to be leveraged with huge amounts of federal and state funding. That opportunity for the private sector to partner with the public sector is here and now."

— TOM KIERNAN, president and CEO, American Rivers

¹ Grabowski, Z. J., Chang, H., and Granek, E. F. (2018). Fracturing dams, fractured data: empirical trends and characteristics of existing and removed dams in the United States. *River Res. Appl.* 34, 526–537. doi: 10.1002/rra.3283

² Duda JJ, Jumani S, Wieferich DJ, Tullios D, McKay SK, Randle TJ, Jansen A, Bailey S, Jensen BL, Johnson RC, Wagner E, Richards K, Wenger SJ, Walther EJ and Bountry JA (2023) Patterns, drivers, and a predictive model of dam removal cost in the United States. *Front. Ecol. Evol.* 11:1215471. doi: 10.3389/fevo.2023.1215471

3. MAKE COMMUNITY & STARTUP FUNDS AVAILABLE FOR PROJECT DEVELOPMENT & OTHER HARD-TO-FUND ASPECTS OF DAM REMOVAL

Dam removals are typically made possible when a broad range of community interests can forge an agreement. This requires reasoned discussions among conservationists, dam owners, recreationalists, city managers, water districts, tribes, government agencies, and many others. This level of project development and early-stage coordination, including project identification, planning, landowner outreach, and stakeholder facilitation is critical to the success of projects, yet extremely difficult to fund. And while contractors' project costs are typically fully covered, tribes and communities often do not have staff capacity to engage in projects, and nonprofits managing projects often do not receive adequate funding for overhead and staff. Funders should seek opportunities to provide this type of catalytic funding and ensure that groups developing and managing projects have sufficient funding to complete the work.

KEY RECOMMENDATIONS

- Direct increased funding to the work of tribes, climate-vulnerable communities, grassroots groups, and other under-resourced entities to develop and implement projects.
- Streamline funding processes whenever possible to decrease the burden on applicants, particularly at the early stages.
- Provide less-restrictive capacity support, especially for low-income communities, tribes, and communities of color. Support communities to lead (not just engage in) projects, and support their technical capacity to do so.
- Consider flexible funding models that allow for projects to be selected based on funding criteria, then allow private and public funders to work in partnership with project proponents to allocate specific funding amounts.
- Broaden funding and increase allowances for indirect costs (i.e., overhead) so that those completing the work can cover activities and expenses, such as community workshops, participation stipends, translation services, meeting food, communications, and day care.
- Support groups with dam removal experience to provide technical assistance to tribes and other communities for all project phases.



SPOTLIGHT: KLAMATH RIVER, CALIFORNIA & OREGON

The largest dam removal and river restoration project in history was completed in 2024 on the Klamath River in Oregon and California. The Yurok, Karuk, Klamath, and other Tribes have led the decades-long effort to tear down four dams to improve water quality and revive salmon runs that are the cornerstones of Tribal culture.

American Rivers and many others first engaged on the Klamath in the early 2000s when the dams' operating licenses were up for renewal. Tribes, states, and nonprofit partners collaborated to work through a complex relicensing and decommissioning process, shaping a collaborative long-term strategy to improve the health of the river. Since 2016, RLF's Open Rivers Fund supported Tribal, nonprofit, and university grantees in undertaking communications, monitoring, recreation planning, research, and Tribal youth projects related to the dam removals and river restoration.

AN OPPORTUNITY FOR RESILIENCE

Without immediate action at the necessary scale, the problems for rivers — and the many communities that depend on them — will accelerate. Species that depend on clean, free-flowing rivers are already facing extirpation and extinction. People remain separated from rivers that once were the center of local culture, and communities face safety threats as major storms increase the likelihood that already-crumbing dams will catastrophically fail. Our clean water is threatened.

Dam removal is the fastest, most cost-effective way to restore river health.

The dam removal community played an integral role in securing \$3.3 billion to manage the nation's aging dam infrastructure through the Bipartisan Infrastructure Law, including significant investments in dam removal and addressing other instream barriers. Together, we can ensure these investments result in healthy rivers, thriving ecosystems, safer communities, and cleaner water.

American Rivers and Resources Legacy Fund (RLF) have spent years supporting communities interested in dam removal projects, advocating for river-positive policies, and fostering collaborative partnerships. American Rivers has also spent years managing on-the-ground restoration and providing technical knowledge others need to give rivers a fresh start. We hope this guide is a helpful resource as you consider opportunities to support efforts to bring ecosystems back to life and improve the water quality and resilience of the communities we all call home.

GET THE FACTS! How dam removal benefits people and rivers: [Bit.ly/DamRemovalExplainer](https://bit.ly/DamRemovalExplainer)



SPOTLIGHT: MIDDLE FORK NOOKSACK RIVER, WASHINGTON

The city of Bellingham, Washington, built a diversion dam for municipal water supply on the Middle Fork Nooksack River in 1961 that blocked access to 16 miles of high-quality habitat for ESA-listed steelhead and Chinook and coho salmon. In 2020, the dam was removed and the water intake was replaced with a modern, non-dam alternative that allows for the movement of fish and boaters. Restoration to support salmon populations as cultural and spiritual resources is important to The Nooksack Indian Tribe and Lummi Nation. The project is a terrific example of replacing old diversion infrastructure with a modern approach that expands the uses and benefits of the river. The project was financially supported by the state, the city, and private philanthropy, including RLF and the Paul G. Allen Family Foundation.

“It was a win-win for salmon and orca. It was also, as is much of restoration work, a win-win for the community because that dam alone created over 200 direct and indirect jobs.”

— STEPHANIE SOLIEN, former cochair, Southern Resident Orca Task Force

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CREATIVE SOLUTIONS. LASTING RESULTS.

American Rivers is championing a national effort to protect and restore all rivers, from remote mountain streams to urban waterways. Healthy rivers provide people and nature with clean, abundant water and natural habitat. For 50 years, American Rivers staff, supporters, and partners have shared a common belief: Life Depends on Rivers. American Rivers is grateful to Resources Legacy Fund for its support, which made the Dam Removal Funders Symposium and this report possible. **AmericanRivers.org**.

Resources Legacy Fund, through its Open Rivers Fund program, supports local communities to remove obsolete dams, modernize water infrastructure, and restore rivers across the American West. We work alongside policymakers, Tribes, nonprofits, academics, and business leaders to advance critical research, policy, and funding initiatives that accelerate the pace and scale of river restoration. **OpenRiversFund.org**.

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MISSISSIPPI RIVER, MISSOURI
ART WAGER