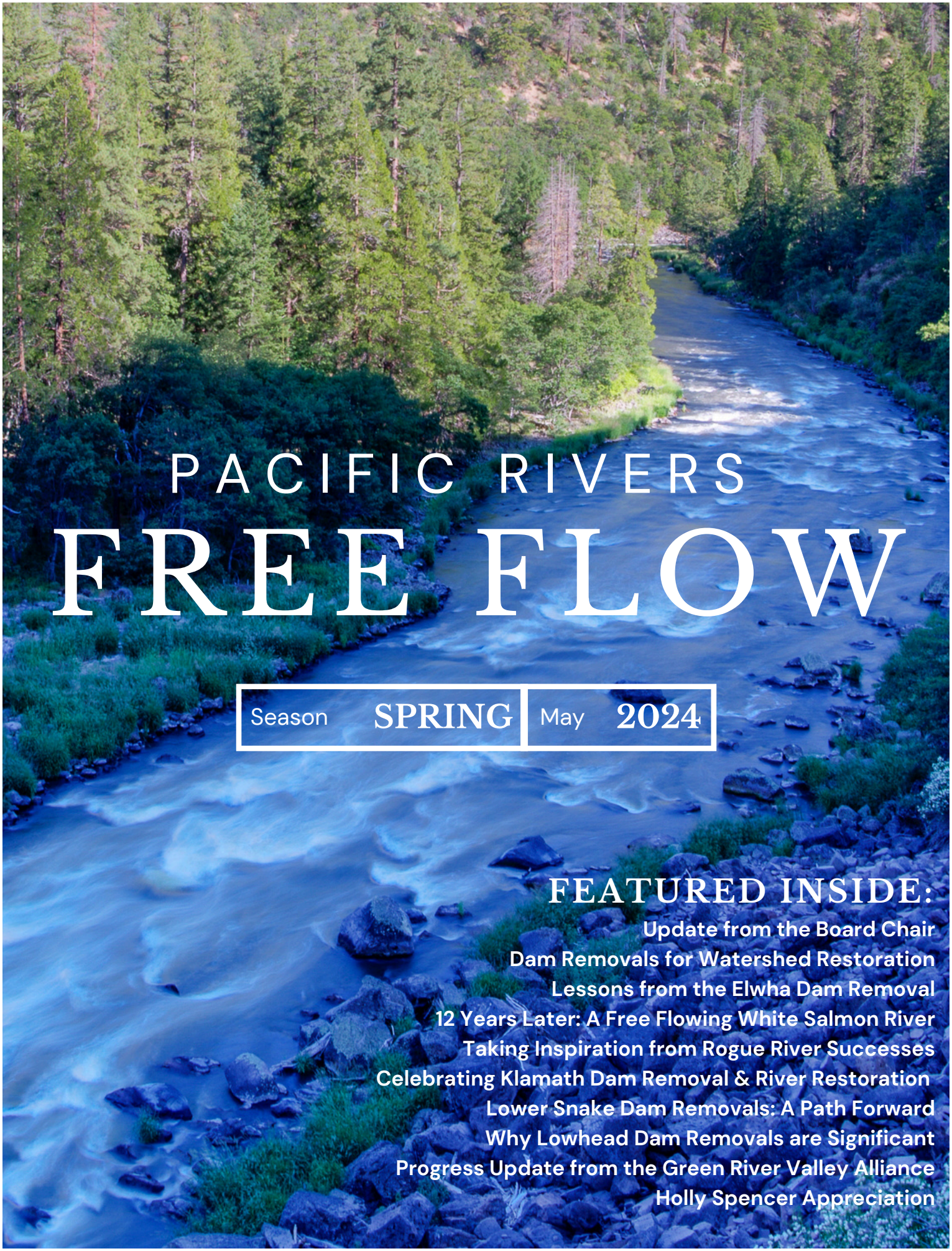


PACIFIC RIVERS

FREE FLOW

Season	SPRING	May	2024

FEATURED INSIDE:

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BOARD CHAIR UPDATE


Mike Morrison - Board Chair

Welcome to your Spring 2024 *Free Flow*, which I think of as a "yesterday, today and tomorrow" edition. At Pacific Rivers we long ago came to understand that a whole watershed approach to river conservation is necessary, recognizing that whatever happens at any point along a watercourse affects the balance of the basin. In this issue we write and inform about as major an influence on a watershed as any – dams. In addition to discussions of the how and why dams interfere with watersheds and why many should be removed, we bring to your attention examples of how past dam removals have improved river health, update you on an ongoing dam removal project on the the Klamath, highlight the upcoming dam removal project on Northern California's Eel River, and again press our case for why the lower Snake River dams must be breached – and soon. Finally, board Treasurer Liz Gilliam, who taught us so much about the value of beavers to watersheds, writes in this issue not only about large dams, but also about the less publicized problems posed by the multitude of small dams dotting the landscape, and the many opportunities in the Northwest for improvements in river health through removals of dams of all sizes that no longer make sense. Please note, also, how many members of the board contributed articles to the issue!

We hope you learn something from this issue – I know I did.

I would also like to give you an update on at least some of our ongoing projects. To start, we are pleased to have developed and approved an Annual Plan for 2024, which will guide our priorities for the year.

The ESA petition we filed along with the Center for Biological Diversity pressing the case for listing Washington Coast spring Chinook as an endangered species is continuing to move forward. A favorable 90-day finding was issued on December 7, 2023; scientists, researchers, fisheries experts, and Tribes had the opportunity to submit additional information to National Marine Fisheries Service (NMFS) in a 60-day comment period that ended on February 5. The next step in the process is a status review, which will lead to a 12-month finding which will either be a "not warranted" determination, or a proposed rule if NMFS determines listing is warranted. A proposed rule triggers a public comment period. We expect that will take place next spring– and we will be counting on all of our supporters and allies to chime in at that time.

We continue to participate in regular meetings of the Technical Team, led by the U.S. Geological Survey, that is wrapping up a multi-year study of mercury pollution and fish contamination in the Snake River. Soon, as per our 2021 agreement, the Oregon Department of Environmental Quality will release for public comment a draft plan to make fish in and downstream of the Hells Canyon reservoirs once again safe to eat. This serious pollution problem can be solved, but it will take considerable effort and time. That is all the more reason to begin soon. We expect ODEQ's science-driven pollution limits and action plan to be finalized by the end of this year. We will provide an update on this issue in our next issue of *Free Flow*.

Our work in the North Umpqua Basin remains a priority. Pacific Rivers is spearheading the effort to work with the Forest Service to put in place a Management Plan for the Frank and Jeanne Moore Wild Steelhead Sanctuary on Steamboat Creek. The site is designated by law as a "Special Management Unit" and we, along with The North Umpqua Foundation and Steamboaters are urging that this "Special" place needs special protection. We have recently received an encouraging response from the District Ranger to our letter proposing a collaborative effort to maximize protection of this important coldwater spawning habitat. We are also working with American Rivers and Trout Unlimited to seek "Outstanding Resource Waters" protection for Steamboat Creek, and are setting our sights on ways we can help restore and protect Canton Creek, a critical tributary of Steamboat Creek.

Cover photo by Bob Wick, Bureau of Land Management.

Through the efforts of the North Umpqua Coalition (of which Pacific Rivers is a member), the Oregon Fish and Wildlife Commission ordered the termination of the summer steelhead hatchery program on the North Umpqua in April 2022, an important step to protecting the river's imperiled wild steelhead. Unfortunately, that decision has been challenged in court by Douglas County (and others) and the court ordered the hatchery program to remain ongoing while the case winds its way through the courts. Meanwhile, the numbers are alarming. The state has set 1,200 as the "critical abundance" number of wild fish necessary to assure a sustainable run. Since fish counts started at Winchester dam in 1946, the number of wild summer steelhead counted was below 2,000 only five times until 2014. But since 2014, that has happened seven of nine years – and only 450 and 960 fish were counted in 2021 and 2023, respectively.

Pacific Rivers and partner organizations continue to advocate for appropriate enforcement responses to the disastrous "repairs" last summer to the private Winchester dam on the North Umpqua. The Oregon Department of Fish and Wildlife has now sued the parties involved, alleging the unlawful "taking" of 550,000 Pacific lamprey. The lawsuit claims the statutory $50 per lamprey killed, for total damages to the People of Oregon of $27,500,000. In addition, the Oregon DEQ brought two enforcement orders for water quality violations totaling $134,378. Both actions are pending, and we are monitoring them closely. Additionally, what work was done to repair the dam was not completed as designed and approved. The plans, for example, called for testing approximately 20% of the tieback anchors, and less than 2% were tested. The Oregon Water Resources Department has issued a Notice of Corrective Action; a failure to adequately correct could lead to a determination that the dam is a public nuisance.

As we move into the summer, please watch for updates from us on Senator Wyden's vitally important River Democracy Act, which seeks to add over 3,200 miles of Wild and Scenic River in Oregon – protection that will help recover endangered fish, contribute to local economies, and aid fire protection in many areas of rural Oregon.

We continue to work in coalitions and to lend our support to partner organizations on key issues of shared interest. Since the last issue of *Free Flow*, we have:

- Written elected officials, as a member of the Save Our wild Salmon (SOS) Coalition, to urge their support of the Columbia Basin Restoration Agreement;
- In coordination with WaterWatch of Oregon, submitted comments to Oregon DEQ in support of its proposed plan to clean up bacterial pollution and make the Powder River safe for human contact;
- Signed on, as a member of the Wild and Scenic Rivers Coalition, to a letter to the USFS concerning river protections on Idaho's Nez Perce-Clearwater National Forest;
- Supported coalitions seeking to conserve large, mature, and old-growth, trees/forests on National Forest lands in the Northwest;
- Supported Washington Wild's successful effort to help protect 2,200 acres of state forests through the Trust Land Transfer in Washington state;
- Supported appropriations for FY 2025 towards the Legacy Roads and Trails Remediation Initiative; and
- Supported the Great Old Broads for Wilderness action alert advocating for the Congressional Voluntary Grazing Permit Requirement Act.

As we believe you recognize, all the above is important work, leading to tangible benefits for the various watersheds. To state the obvious, none of the work in which we engage can happen without *you*. We are humbled by and deeply appreciative of your support. Thank you.

Finally, we would love to hear from you. Questions, comments, or ideas are all more than welcome – email us at info@pacificrivers.org.

— *Mike Morrison, Board Chair*

Marmot Dam on the Sandy River, before and after its removal in 2007. Photos by Thomas O'Keefe, American Whitewater.





Liz Gilliam - Board Treasurer

DAM REMOVALS FOR WATERSHED RESTORATION

Let's collectively celebrate the good news for rivers in 2023 – not only did the decommissioning of four dams on the Klamath River commence, but also 79 dams were removed across the US opening up 1,160 upstream river miles (American Rivers Database of Dam Removals 1912-2023). In the last seven years, 587 dams have been removed, reconnecting 7,098 upstream river miles. The pace and scale of dam removal is increasing, and it has proven to be one of the most environmentally efficient and cost-effective ways of restoring rivers, bringing wide-ranging benefits to both people and ecosystems.

In this issue of *Free Flow*, we highlight the successful watershed restoration efforts of dam removals that have been completed to date and look forward to all the good work that is still critically needed.

Legacy Dams

Starting in earnest in the mid-1850s dams were placed in the northeast and Midwest, to support lumber mills and material transport. In the West, damming waterways was seen as a mighty accomplishment to tame the wild and allow for settlements, agriculture and progress. The era of large-scale hydroelectric dam building spanned roughly four decades, from the 1930s through the 1960s. These dams have all aged significantly, and the landscape and populations have evolved; many stand forgotten and unseen, and function in diminishing capacity. The cost of needed repairs is often greater than the value the aged infrastructure may (or may not) provide. What they *all* are doing is impacting the entire river corridor both up and downstream, and that impact has continued over the decades of the lifespan of these dams.

Dam Problems

It is common knowledge that dams block upstream and downstream passage for adult and juvenile fish. Multimillion-dollar infrastructure improvements – such as fish ladders, fish transfer stations and improved

spillways – have helped to improve these conditions, but they are nowhere near adequate to support a resurgence of thriving fisheries. Dams have directly contributed to the extinction of 29% of the salmon populations in California and the Pacific Northwest, and the threat or endangerment of many that remain, according to American Rivers. River hydrology and water quality are also clearly impacted by dams.

Dams are engineered to retain water and alter hydrology; that is their job and they do it very well. They are equally effective at retaining sediment, the solid materials that are moved by and along rivers. Typically, sediment is contributed to a river throughout its course, but mostly in its upper reaches. That sediment bounces, rolls and is flushed downstream and over years, decades, centuries and millennia the processes of hydrology (precipitation and streamflow) combined with erosion and sedimentation of the river corridor, has created the form of the waterways as we experience them today. Removing sediment from the equilibrium, as dams do, disrupts river function both physically and biologically (across huge areas – especially if dams are located in the mid- and upper reaches of watersheds). For example, massive bank erosion occurs as 'sediment-starved' rivers eat away at banks, and scour of the riverbed occurs causing widespread incision, undermining roads and bridges and streamside infrastructure. Sediment is not only sand and rocks, but other materials with important nutrients for the whole system. Lack of distribution of sediment is a huge problem for society – costing hundreds of millions of dollars a year in damages.

More than 530,000 dams block rivers across our country (SARP 2024). Of the 92,075 dams large enough to be included in the National Inventory of Dams (greater than 6-ft tall), only 19% provide flood risk reduction, 18% provide irrigation or water supply, and 3% provide hydropower (USACOE 2024). 85% are 50 years or older and 63% are privately owned. Many no longer provide the services they were built to provide decades to centuries ago. Notably, there are 133 retired hydropower projects where dam infrastructure remains in the river (Johnson et al. 2020). There are also an astonishing 440,000 smaller, lowhead dams that are not in the National Inventory that are even more prone to being obsolete and unmaintained.



Anonymous activist artists painted a "cut here" scissor graphic on the obsolete 200-foot tall Matilija Dam near Ojai, California in 2011. The dam is planned for removal in 2030. Photo courtesy of American Rivers.

Removing the aging infrastructure, where feasible, allows the watershed to heal itself. And thanks to decades of activism, we are starting to see the acceptance of dam removal as a way to evolve our energy infrastructure and provide huge benefits to our anemic river systems.

Fights for Freeing Rivers Begin

Activism for dam removal heated up in earnest in the 1980's when Earth First! activists unfurled a banner down the face of the Glen Canyon Dam. The graphic made it look like the dam had developed a 300-ft crack down the middle. The Edwards Dam removal on Maine's Kennebec River in 1999 was a turning point in discussions about dam removal. It was the first time the Federal Energy Regulatory Commission (FERC) ordered a dam removed because its costs outweighed its benefits. This signaled a shift in thinking from a radical concept to what can be a proven tool for restoration. And it has had a ripple effect.

The dam removal movement has been gaining momentum. Many dams have reached the end of their useful lives and pose public safety risks, negatively impact fish and other aquatic life, and can be costly liabilities to



Jane Stackhouse with the Oregon League of Conservation Voters Metro Climate Action Team joins activists calling for dam removal during a vigil for salmon in Vancouver, WA. Photo by Alex Milan Tracy.

their owners. Countless dams are abandoned, not profitable, or require expensive repairs and upgrades. Removing dams restores native aquatic life to rivers, increases climate resilience, and reduces the risk of aging dams failing and causing catastrophic flood damages and even loss of human life.

Addressing Concerns about Dam Removal

Decisions to remove aging dam infrastructure are often clouded by uncertainties over potential environmental benefits and detriments of removal. Concerns and uncertainties surround sediment release especially (e.g., Downs et al. 2009). In a detailed assessment of completed dam removals, the USGS found that in many cases more than a third, and sometimes two-thirds, of stored sediment has been evacuated within weeks to months of dam removal (Major, J.J. 2017, USGS DRIP Database), and relatively stable channels within former reservoir beds have established themselves swiftly. Major downstream channel adjustments achieved apparent stability within months to years. Despite concerns, most removals to date have shown adverse geomorphic impacts are short-lived and have been neither as damaging nor as long-lasting as feared.

The time between removal and recovery of a river is very short while the positive impact on people and nature is far-reaching. And we have no time to waste. 29% 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 (American Rivers Summary 2023 Dam Removals).

Pacific Rivers currently has an Endangered Species Act petition for Washington coast spring Chinook underway with the National Marine Fisheries Service. Other organizations have brought forth additional petitions for more fish in more areas. One study by the Center for Biological Diversity compared the actual recovery rate of 110 ESA-listed species with the projected recovery rate in their federal recovery plans, finding 90% of species recovering as specified by the plans. We know this measure is effective at bringing additional protections to recover salmon – for which the first step is undoubtedly river recovery.

Money Talks

Removing aging dams can be significantly cheaper than rehabilitating them, according to a study from the Division of Ecological Restoration (IEC 2015). Over 30 years, removal of the three dams in the study was 60% less expensive, on average, than repairing and maintaining them. Though more expensive in the short term, removal eliminates the expenses associated with insurance coverage, maintenance and safety repairs, as well as direct and indirect expenses associated with fish and wildlife protection (e.g., fish ladders and mitigation for fish mortality). In addition, removal often generates income from newly available recreation opportunities – including fishing, kayaking, and rafting – which may result in a net economic benefit to river communities.

Dams require ongoing maintenance. When older dams are no longer used for their original purpose, dam owners may defer maintenance to the point where the dams pose a threat to public safety *(see Dam failure on*

Michigan's Tittabawassee River in 2020). The elimination of ongoing maintenance with the dam itself, but also the associated re-supply of sediment in the river downstream of the dam can result in long-term savings. A study by Portland State University researchers found that billions of dollars could be saved if the nation's aging dams are removed rather than repaired (Zbiniew et al. 2018). Many dams are still important and serve a purpose, and only a small percentage will be removed in the next decade, but cost savings can still be realized even with individual dam removals.

Many older hydroelectric dams were built to support nearby mills, factories and communities, and have relatively small generating capacity. As the U.S. power grid has shifted to more regional rather than local production, power produced by smaller dams can be more expensive than power from regional sources or may no longer be needed. A pertinent example is the Lower Snake River Dams. They produce the most electricity in months when it is needed least (when the region actually has a massive surplus), and the least in the late summer months when it is needed most. It simply is not the right solution for energy production going forward (NW Energy Coalition 2024).

Neighboring communities benefit from free-flowing rivers with increased whitewater recreation and other river-related tourism when visitors spend money with local guides, outfitters, restaurants, and other businesses, bringing new money to oftentimes remote communities. The enhanced recreational opportunities help to pivot from any reliance on reservoirs (Brower and Sheremet 2017). Many whitewater parks are being constructed at small dam removal sites, and the excitement about the opportunity to float new and longer stretches of a river draws in many new river users.

And, while not an immediate injection of funds, we must not undervalue the ecosystem services, such as water quality improvements and habitat provisions, that dam removal can provide. While these are often not directly monetized or readily witnessed by the community, they absolutely contribute to the well-being of communities, culture and place.



Dam failure on Michigan's Tittabawassee River: After three days of rain, the Edenville Dam collapsed in May 2020, releasing a torrent that overtopped the downstream Sanford Dam and flooded the city of Midland, located about 128 miles northwest of Detroit. Thousands of people were temporarily evacuated and 150 homes were destroyed. U.S. Air National Guard Photo by Master Sgt. Scott Thompson.

Who Pays for Dams?

It is rare for a private owner of a dam to foot the entire bill for removal. There are grant programs in place to help with the costs, and dam removals can be sponsored by other entities. Landowners are often absolved of financial responsibility.

THE GOOD NEWS is the current administration secured passage of the bipartisan Infrastructure Investment and Jobs Act, which includes $2.4 billion for the removal, retrofit and rehabilitation of dams, and of that, over $800 million is made available for dam removal. Two years since the bill passed, 89 dam removals have been funded (U.S. Fish and Wildlife Service, Fish Passage Portal, https://www.fws.gov/story/2023-04/federal-interagency-fish-passage-portal).



Vigil for Salmon protest. Photo by Ben Herndon.

Let 'em Go!

There are tens of thousands of outdated, obsolete dams nationwide whose impacts outweigh the benefits they provide. Most no longer serve their original purpose, are not being maintained, and pose safety hazards.
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 dam removal is a powerful solution that is proven and works on the watershed scale.

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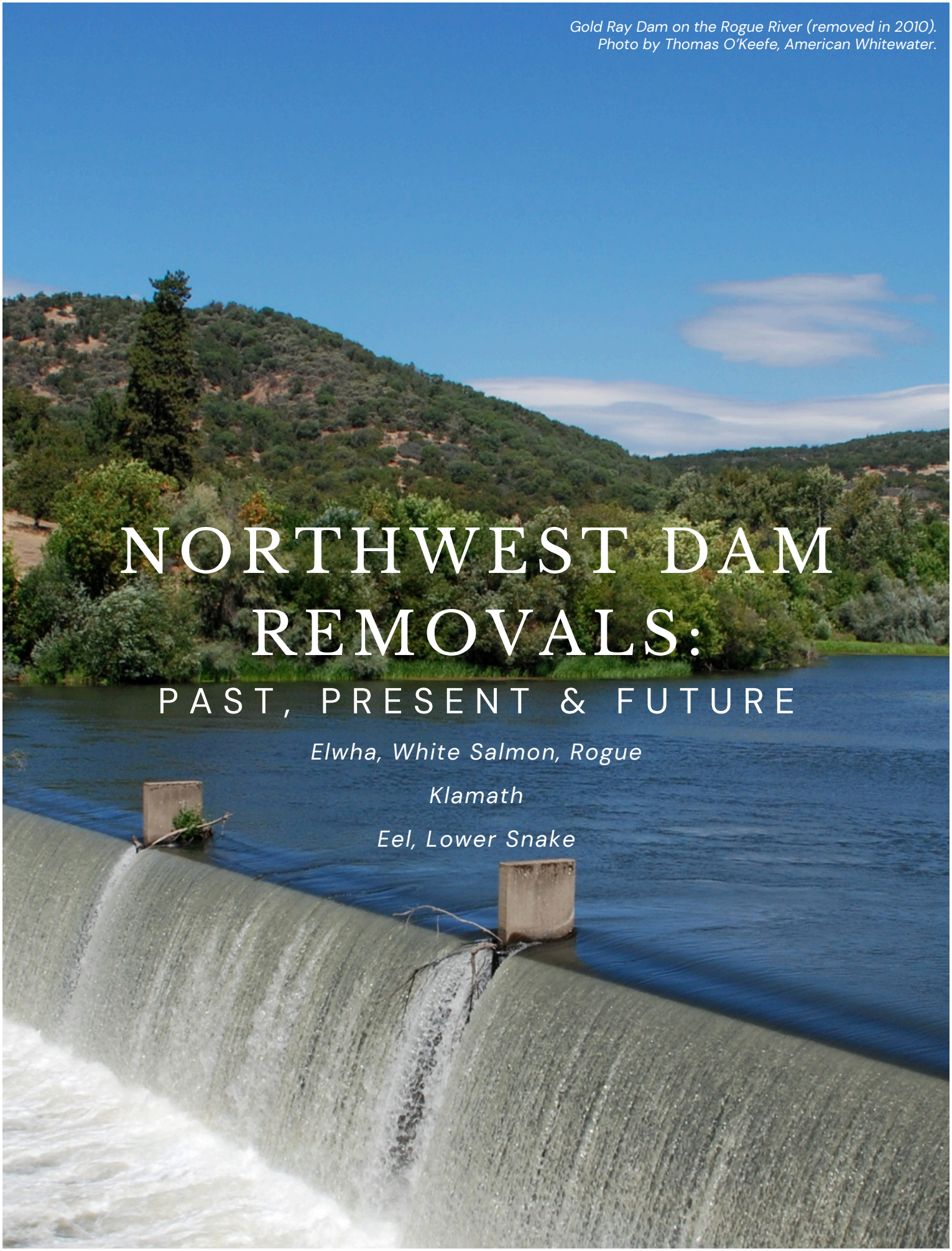
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Gold Ray Dam on the Rogue River (removed in 2010).
Photo by Thomas O'Keefe, American Whitewater.

NORTHWEST DAM REMOVALS:

PAST, PRESENT & FUTURE

Elwha, White Salmon, Rogue

Klamath

Eel, Lower Snake

Elwha ceremony keynote speakers, Billy Frank and Frances Charles, September 2011. / Elwha dam removal celebration ceremony. Photos by Kate Benkert (USFWS)

ELWHA BE FREE







"I believe in the sun and the stars, the water, the hawks flying, the rivers running, the wind talking. They tell us how healthy we are, because we and they are the same."

— Billy Frank Jr., Nisqually Tribal Leader and former long-standing Chairman of the Northwest Indian Fisheries Commission

Since time immemorial, the Elwha River on Washington's Olympic Peninsula had been home to some of the most diverse and prodigious fish runs anywhere. They included chum, pink, sockeye, coho and Chinook salmon; steelhead, cutthroat, and bull trout; and Pacific lamprey.

All those runs were blocked abruptly in 1913 when the 108-foot tall Elwha Dam was illegally built five miles upstream of the river's mouth. This action blocked fish migrations in the Elwha and its tributaries. In 1927, a second dam, 208-ft tall Glines Canyon Dam, was completed upstream, adding insult to injury.

In 1938, Olympic National Park was established, encompassing most of the watersheds of the Elwha and several other great salmon streams on the Olympic Peninsula. The purpose of the park was to preserve its natural resources and cultural traditions. But some were missing – the Elwha's anadromous fish and their customary use by its Indigenous people.

Over the next 50 years there was much debate, eventual litigation, and finally legislation. In 1992, Congress passed and President George H.W. Bush signed into law the Elwha River Ecosystem and Fisheries Restoration Act. It authorized the largest dam removals to that date in U.S. history.



Elwha dam breached in September, 2011. Photo by Kate Benkert (USFWS)

Preparation was meticulous, because there was much to be careful about and even more to be learned. When all was ready, the Elwha Dam was breached on September 15, 2011. It was gone by 2012, and Glines Canyon Dam was as well in 2014.

The river got right to work.

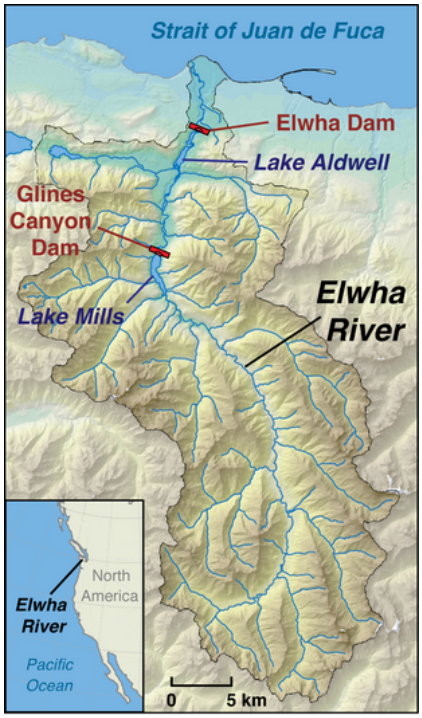
At last, it was able to start moving a century's accumulated sediment to the sea. It will take decades for it to finish finding its new physical and ecological equilibrium, but early results pleasantly astounded observers.

In the first four years, winter steelhead more than tripled in number to more than 1,000. Summer steelhead were an even bigger surprise. They were almost nonexistent in the system before dam removal. Yet in 2018, 70 steelhead were already confirmed in a single sampling area high in the river's headwaters. Even better, juvenile steelhead were abundant in the main river's floodplain. Perhaps the biggest surprise of all was the resurgence of bull trout. They quickly regained anadromy, quadrupled in number in the first four years, and already had much larger 1 and 2 year-old age classes.

The nearshore environment at the river's mouth also benefited in myriad ways. The free-flowing Elwha very quickly reversed decades of coastal erosion as sediment movement was restored. The restored sediment influenced the nearshore fish communities and revitalized that local ecosystem.



What was formerly a reservoir called Lake Mills caused by the Glines Canyon Dam, now with substantial regrowth. Photo by Liz Perkin.



USGS map of the Elwha river and the previous dam sites.

After the dams were breached, the Lower Elwha Klallam Tribe imposed a five-year moratorium on all fishing in the river, then extended it twice for a total of 12 years to give salmon runs time to begin to recover.

Last fall, enough improvement had been made for the Tribe to open a limited ceremonial and subsistence fishery. It was for coho only, and was capped at 400 fish. But it was a triumph, and just cause for celebration for the Elwha and its people, who now look forward to abundant salmon in the years ahead.

Every river is different. So is every dam, and every dam removal. There are lessons to be learned from each. The Elwha isn't just doing its sediment-moving job again. It's also teaching us how rivers work and how ecosystems can recover if we let them. It's a new era for the Elwha, and for river restoration.



Vanessa Castle, with a large coho she caught on the first day of the fishery on the Elwha river. Photo by Vanessa Castle

"To go to the river's edge and experience it is reinforcing everything that we understand or feel or sense from the river. The power, the restoration to our own souls and minds, to our spirituality. It impacts us just to be there."

— Lower Elwha Klallam Tribe Elder



THE WHITE SALMON'S BIG BANG

"There were seven dams proposed on the White Salmon River all the way to the community of Trout Lake. We fought them all. People have to respond to threats to the river. As you get involved in protection your heart grows, your soul grows."

— Pat Arnold, Chair of Friends of the White Salmon River



The White Salmon River before removal of Condit Dam in 2011.
Photo by Thomas O'Keefe, American Whitewater.

It was the biggest and arguably the most exciting dam breach to that point in history. The 100-yr old, 125-ft tall Condit Dam on the White Salmon River was ceremoniously breached in October 2011 by way of dynamite – a final celebratory exclamation point to a dam removal decades in the making.

The dam was located 3.3 miles upstream from the river's confluence with the Columbia River, effectively blocking anadromy for over 100 years to a watershed of cold, clean water. The White Salmon is now free-flowing throughout its length.

The removal opened up 27 kilometers (km) of potential coho salmon habitat, 15 km of potential spring Chinook salmon habitat, 7 km of potential fall Chinook salmon habitat, and 50 km of potential steelhead habitat (Jezorek and Hardiman 2016). In addition to newly accessible habitat upstream, areas downstream of the Condit Dam site have improved for salmonid spawning and rearing as gravel and cobbles have distributed through the downstream reaches (Hardiman and Allen, 2015). Salmon and steelhead accessed the upper river and its upper tributaries quickly after removal. Just one year later, Chinook salmon spawned less than 100 feet from where the dam once stood. Even Pacific lamprey have now been seen above the former dam site (Hawley 2023).



Looking upstream at the site of Condit Dam following removal, nary a trace.
Photo by Thomas O'Keefe, American Whitewater.

Now, 12 years after the breach, hardly any traces of the dam remain, and the river has completely cut through the reservoir's old bed (Major 2014). Spawnable gravel has been increasing in the lower river. Where there often was not enough flow in the lower river to pass fish upstream, the fish are now reaching the very upper extents of their original habitat and making very good use of the excellent habitat downstream of the dam.

Juvenile salmonid sampling efforts have shown that natural spawning produced steelhead and coho smolts and that coho were colonizing some tributaries (Jezorek and Hardiman 2023).

Perhaps the biggest users of the lower river are now recreational boaters who enjoy the newly navigable and spectacular rapids in the canyon downstream of the former dam site, a part of the river that had often been dry for nearly 100 years. Kayakers, rafters, and fisherman now have the ability to float downstream all the way to its confluence with the great Columbia River.

The White Salmon River Basin in Washington has long been an important watershed given its large amounts of groundwater inflow that make it especially resilient to climate change, and its potential to support recovery for ESA-listed fall Chinook salmon, steelhead and coho salmon. It was a financial decision to remove the dam, but the hope for the future is an ecological one.

"It's salmon versus dams. Dam removal should be on the table. Salmon are our food source, people need to be mindful of the First People on this land. These are our ancestral lands."

— Jeremy Takal, Yakama Nation Fish and Wildlife Committee Chair



The replanted area of the former Northwestern Lake one year after breaching in October 2012.
Photo by Thomas O'Keefe, American Whitewater.

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Liz Gilliam - Board Treasurer

GO ROGUE

"A river is some spooky magic. Apparently out of nowhere, water rises from solid earth and falls toward a distant sea. Such magic has returned to the Rogue."

— Daniel Arnold



The free-flowing Rogue River.
Photo by Thomas O'Keefe, American Whitewater.

In Oregon's Rogue River, the removal of obsolete dams and passage barriers and restoration of instream water rights to river flows began in earnest over 10 years ago – and the momentum is growing. These accomplishments should serve as inspiration for the power of community engagement and environmental stewardship to reverse the ecological impact of decades of human interventions.

The Rogue now boasts one of the longest reaches of free-flowing rivers in the West – 157 miles(!) thanks to the tireless advocacy of a number of groups, including WaterWatch of Oregon. The 39-ft tall Savage Rapids Dam was removed in 2009 after 15 years of controversy and heated debate. The following year, the removal of Gold Ray dam opened up 157 reconnected river miles. These removals led to a ripple effect: more than 15 large dams and several smaller structures have now been removed, with several more in the works. Two dams were removed in 2023, one on a tributary to the Illinois, in the upper Rogue watershed, and another in the Applegate subbasin. Three dams were removed in 2021, and two others in 2022. None of these could have been accomplished without extensive community involvement and multi-stakeholder engagement.

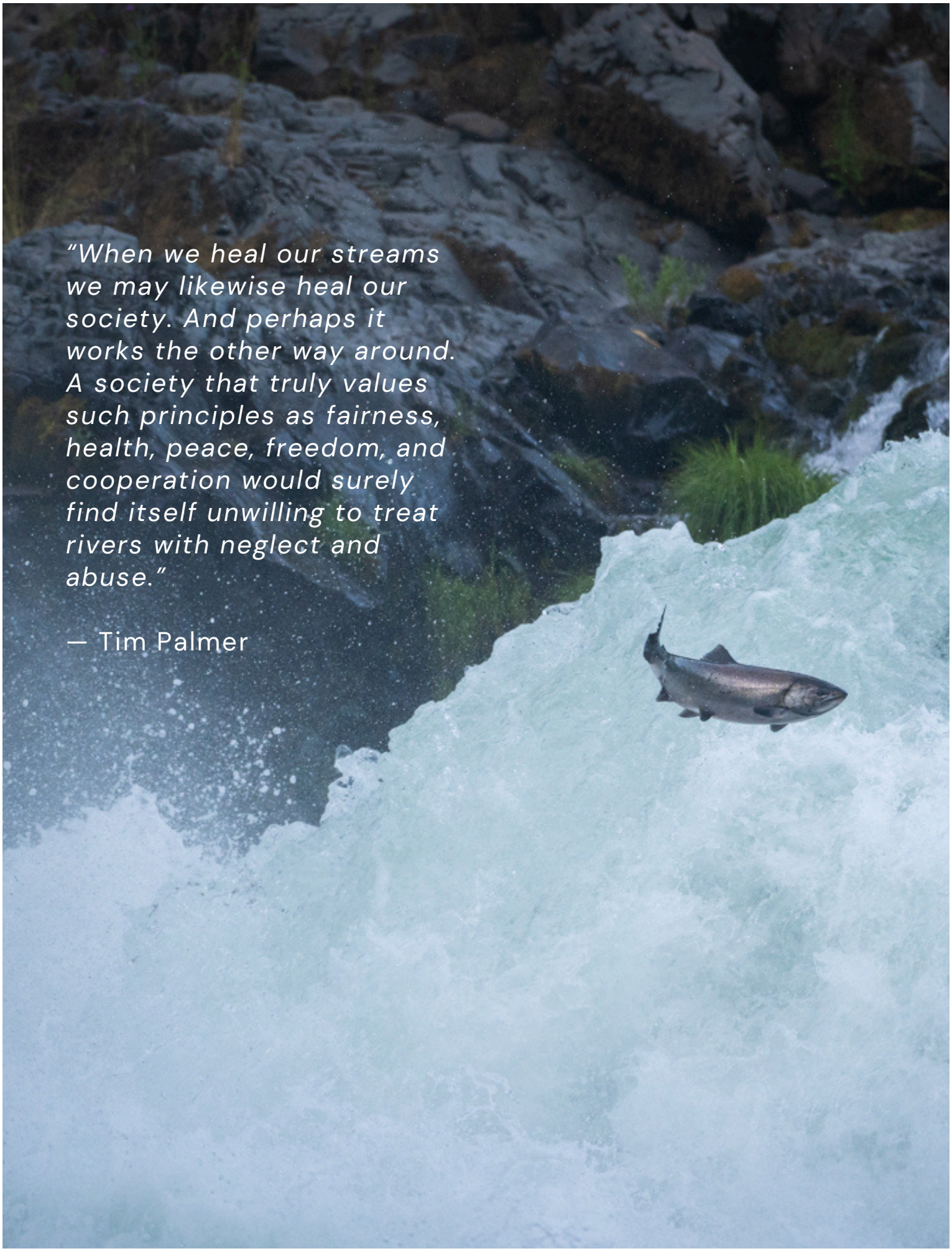
After these removals, fish were observed in the newly accessible waters almost immediately. Following dam removals on Evans Creek in 2015, Chinook salmon were observed to be spawning where they had not been observed since dam construction. Salmon redds are now in waters of what used to be stagnant reservoirs.



A rafter takes the lower-risk side channel at Rainie Falls on the Rogue River.
Photo by Thomas O'Keefe, American Whitewater.

Access to cold water tributaries is available when the fish need it in increasingly hotter summers, and unencumbered outmigration gives the young cohorts opportunity to rear where it suits them. Additionally, river advocates have also successfully converted a 517 million-gallon-per-day water right to an instream water right to protect mainstem river flows – forever.

Let this success story be a testament to the resilience of nature (and environmental stewards) and the potential for recovery when we make intentional choices to restore, protect, and preserve our waterways.


“When we heal our streams we may likewise heal our society. And perhaps it works the other way around. A society that truly values such principles as fairness, health, peace, freedom, and cooperation would surely find itself unwilling to treat rivers with neglect and abuse.”

— Tim Palmer

HISTORIC RIVER RESTORATION PROJECT UNDERWAY ON THE KLAMATH



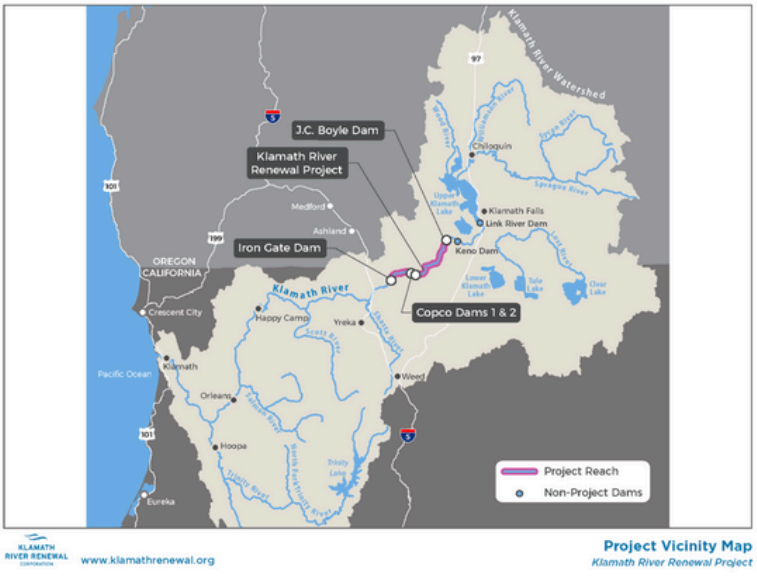
Copco 1 dam removal officially begun with a boom ahead of schedule.

It begins! The largest dam removal and river restoration project to this point in world history is now underway. The initial phase of the drawdown of four Klamath River reservoirs is complete. More than 400 miles of habitat for salmon, steelhead and other native fish have been reconnected to the lower Klamath and the sea.

Work on the project officially began in March of 2023 with preliminary work including bridge upgrades and worksite development. Deconstruction of the smallest of the four dams began in June, 2023 and concluded last November. In early January of this year a low-level outlet tunnel was opened in the Iron Gate dam to begin drawdown of the reservoir behind it. It continued with a bang (literally) on January 16, when a tunnel stop log was blasted at the JC Boyle Dam. By mid-February the initial phase of the drawdown of all four reservoirs was complete.

This moment ushered in a new era for the Klamath, as a decades-long restoration process began immediately. Crews are now dismantling the remains of the dams. Meanwhile, the Yurok Tribe and their partners have already begun planting billions of seeds of native plants that will help stabilize the drained reservoirs' footprints and restore the ecology of the river and its floodplains.

We celebrate this historic milestone in river restoration with gratitude to all the Tribes, organizations, agencies, businesses, and individual champions who stayed the course for 30 years and made it possible. We now look forward to the day when other great rivers of our region like the Eel and the Lower Snake also run free again.



Map from Klamath River Renewal Corporation.

Shane Anderson is a filmmaker and cinematographer whose team is documenting this process. We can look forward to their documentary "Undamming Klamath", which is currently in production. In the meantime, Swiftwater Films is sharing amazing footage as they go, for example, all of the photos in this article and videos like "Klamath River Dam Explosion" on YouTube. Shane Anderson interview excerpts are taken from Sidechannels presented by The Flyfish Journal, a new podcast coming in May. To hear Shane's full interview, as well as interviews with other leaders in conservation and flyfishing culture, subscribe to Sidechannels wherever you find podcasts or visit www.theflyfishjournal.com.

"It's one thing to remove one dam. It's another thing to do four dams and make sure you're balancing hydrology to keep water in the river. It's a really fascinating part about this dam removal that was different than other dam removals — combining engineering with hydrology and science."

"It got a little ugly in February [2024]: dissolved oxygen levels tanked and we all knew that was coming. It killed probably everything in the river for about a 15-mile stretch right below the dam and then the oxygen levels were better the rest of the way down. It looked kind of apocalyptic, even though it was for the better. You have to have this death to have the rebirth ultimately. But it was heavy. The water looked like oil in some places. It was thick and black, 100 years of sediment coming out. But again, we all knew it was coming and it was a necessary part — all restoration starts off messy and we have to realize that there are these short term consequences for these long-term benefits... I look at it as the dark night of the soul or the third act twist in the film."

"The Yurok Tribe is planting the whole reservoir footprint with 16 billion native seeds that they've propagated and collected over the last seven years, and we're already seeing those sprouting. The changes in the ecosystem are fascinating right now... It could probably only be replicated in a volcano exploding or something like that, seeing how rapidly creeks are cutting through sediment and sprouts are coming up and wildlife is changing. To me that dynamic part of this project is what's really cool."

"Spending time with people and hearing their stories before we're filming them has been a big blessing with this. Environmental stories are social stories. Environmental justice stories are social justice stories."

"All the dams will be out by the end of September. A free-flowing Klamath River! I'm really intrigued to see if that fall run of salmon will make it past and I think they will. I know they will."

— Shane Anderson, Filmmaker at Swiftwater Films



Shane Anderson looks out at the JC Boyle dam following the reservoir's drawdown.





Before and after reservoir photo of the Copco Reservoir.

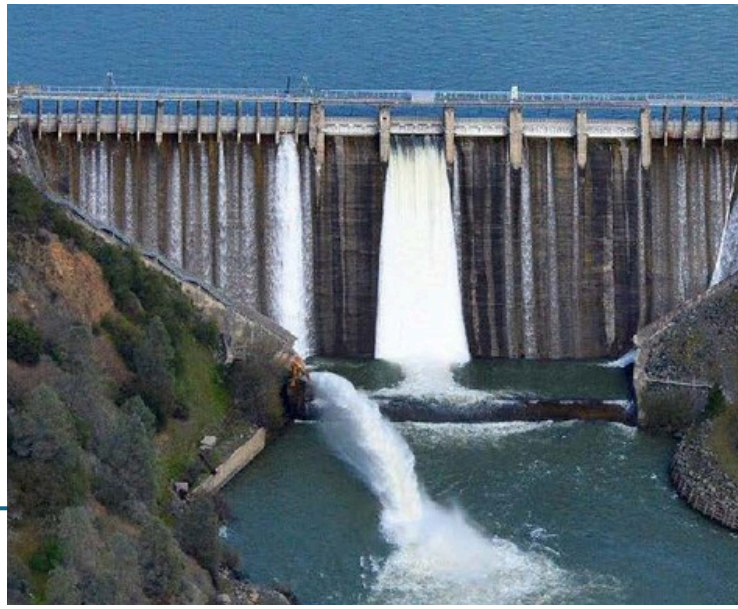


The Klamath running more freely than it has in over a century.



Nicky Scott - Board Member

BRIGHT PROSPECTS APPEAR FOR THE EEL RIVER



The ladderless Scott Dam blocks nearly 300 river miles of upstream cool-water spawning habitat. Photo courtesy of PG&E.

"At least this once, finances are in favor of the fish and river restoration. PG&E wants to be free of the Eel River dams as soon as possible, and we are hopeful we will see a free-flowing Eel in the near future."

— Samantha Kannry, Farmer and Fisheries Ecologist

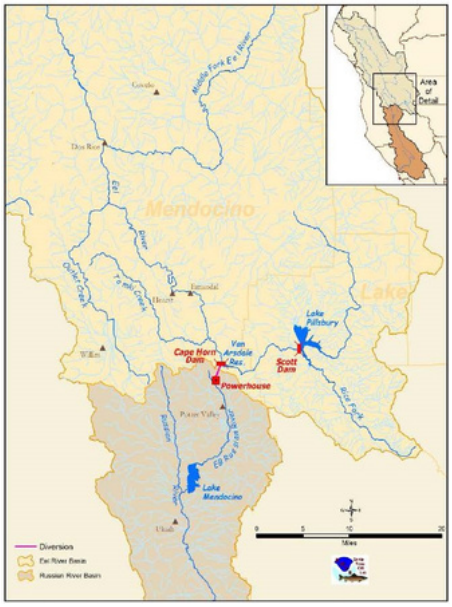
This spring, we celebrate recent events and decisions regarding a once and future great salmon and steelhead river of Northern California.

The Eel River

The Eel River rises near Bald Mountain in the Northern California Coastal Range and flows roughly north to northwest for almost 200 miles through the Mendocino National Forest to its mouth just south of Humboldt Bay. Draining 3,684 square miles, its watershed is California's third largest. 398 miles of the Eel and its major tributaries are designated Wild, Scenic or Recreational under the National Wild and Scenic River Act.

Historically, the Eel supported some of the largest runs of salmon and steelhead on California's North Coast. Before development in its watershed increased rapidly in the mid-19th century, returning spawners averaged more than one million per year. But today, the Eel's salmon and steelhead teeter on the brink of extinction. Last year, American Rivers named the Eel one of America's Ten Most Endangered Rivers™.

This is the story of the past, present and emerging future of the Eel River.



Map from PG&E.

The Potter Valley Project

The Eel's flows are highly variable, with average flows in January and February more than 100 times greater than those in August and September. The flows of the Russian River system to the south of the Eel are highly variable as well.

The Potter Valley Project (PVP), conceived and developed in the early 20th century by the Eel River Power and Irrigation Company, was a complex of two dams, two reservoirs, and a diversion tunnel to bring water from the

Eel to the upper Russian River. The PVP allowed development and farming to flourish in Potter Valley, which is normally starkly dry during the summer and fall.

The initial Potter Valley project consisted of the 96-foot tall Cape Horn Dam on the Eel that was completed in 1908, a small (700 acre-foot) reservoir it impounded, and the diversion tunnel to the Russian River Basin. An ineffective fish ladder on the Cape Horn Dam blocked much upstream fish migration. The diversion tunnel included penstocks for electricity production.

In 1922, Scott Dam was completed 12 miles upstream of Cape Horn Dam. Standing 138 feet tall, it originally impounded 95,000 acre-feet of water in "Lake Pillsbury" (i.e. Pillsbury Reservoir) to augment PVP flows during dry months. Constructed with no fish ladder, Scott Dam blocks all upstream fish migration to this day. In 1930, the PVP was acquired by Pacific Gas and Electric Company (PG&E), which has operated it since.



The nearly 100-foot tall Cape Horn Dam. Photo by Kyle Schwartz.

Historic Impacts

Large canning operations along the Eel began in the 1850s. By their peak in 1877 they canned an unsustainable 600,000 salmon and steelhead in a single year. In the decades ahead, watershed impacts from activities including logging and grazing compounded those of the canneries on the river and its fish. They were compounded again with the development of the Potter Valley Project in the early 20th century.

By 1922, Scott Dam completely blocked almost 300 miles of crucial high-elevation, cool-water spawning habitat upstream in the Eel's watershed and altered the volume and quality of flows downstream. In the following decades there were fluctuations in fish returns from year to year, but the long-term trend was steadily down. By 2010, returning salmon and steelhead averaged only about 3,500 per year — well less than 1% of their historic abundance. Today, the Eel's Chinook salmon, coho salmon, and steelhead are all listed under both the state and federal Endangered Species Acts.



Aerial photo of the Scott Dam and the high-elevation habitat it blocks. Photo courtesy of Friends of the Eel River.

Advocacy & Regulation

Concerned about the impacts of the PVP, the Round Valley Indian Tribes and area conservation groups worked for decades to bring public attention to the plight of the Eel. In time, they also challenged the relicensing of the PVP. In public and in court, they worked tirelessly to reduce the effects of the PVP on the Eel's flows, fish and people.

In the 1980s, courts mandated that more water be released into the Eel system during drier months to support decimated fish stocks. In 2004, the Federal Energy Regulatory Commission (FERC) placed further limits on the amount of water the PVP could divert.

Further Complications for the PVP

Problems regarding the PVP continued to accumulate. PG&E acknowledged that the Scott Dam poses a serious seismic risk and therefore decided never again to raise "Lake" Pillsbury to full pool. That commitment decreased its storage capacity by about 20,000 acre-feet. (A century's worth of accumulated sediment had already decreased its capacity by that much or more, leaving its current capacity only about half its original.)

Costs for PG&E to maintain the PVP's aging power generation facility continued to increase. When a transformer failed in 2021, it was shut down. It has generated no power since.

Recent Events & Decisions

In 2019, PG&E decided not to pursue FERC relicensing further because by that time operating and modernizing the PVP had clearly become prohibitively expensive. What was unclear at the time was whether another entity would step forward to take responsibility for the project. (None has.) When its license with FERC expired in April of 2022, PG&E began to prepare for decommissioning.

Meanwhile in 2022, conservation and fishing groups filed a lawsuit against FERC for Endangered Species Act violations, stating that the PVP limits salmon and steelhead access to critical portions of their habitat, closes fishways at key moments in their life cycle due to reduced water flows, encourages predation by virtue of fishway design, and facilitates inhospitable temperatures for salmonids.

In November, 2023, PG&E announced and invited public comment on an initial draft plan for removing the two Eel River dams and surrendering its FERC permit. A final draft must be submitted to FERC in June of this year. FERC expects PGE's final surrender application to be complete by January 2025.

PG&E now wants to be free of the Eel River dams as soon as possible. *Both the Cape Horn Dam and the Scott Dam will likely be removed beginning in 2028.*

Removing the dams is just one component of the path to a healthier Eel watershed — but it is a vital one for the river to reconnect and recover. Pacific Rivers strongly supports the removal of both the Cape Horn Dam and the Scott Dam. We applaud the work of all the parties that led to this moment of promise. In light of the continued decline of salmon populations and the complete collapse of salmon fishing in California, dam removal remains one of the most important ways to help our endangered fish populations recover in the Eel and other rivers.

For more on this issue, visit the websites of the Friends of the Eel River and Humboldt County, CA:
https://eelriver.org/projects/potter-valley-project/
https://humboldtgov.org/3460/Eel-River-and-the-Potter-Valley-Project

To learn more about the Eel River and influences on its wellbeing, we recommend "Seasons of the Eel" by Jason Hartwick and Shane Anderson, available to purchase on our website: https://www.pacificrivers.org/store





Lower Monumental Dam on the Snake River.

LOWER SNAKE RIVER DAM REMOVALS: A PATH FORWARD



Rick George - Board Secretary

"If the salmon and steelhead are running, then as far as I am concerned, God knows that all is well in His world...the health of the environment is good if the salmon and steelhead are around. It is that simple."

— Former Oregon Governer Tom McCall

Dams differ. Some are more harmful than others. Some provide fewer public benefits than others. On balance, some still make some sense today. Others don't.

Few if any make less sense today than the four federal dams on the lower Snake River. They were controversial from the start. Their disastrous impacts on salmon, other native fish, and the people who depended on them were widely anticipated, and they were indeed immense upon completion of the first dam more than sixty years ago. Their public benefits then and especially now pale in comparison. They have brought salmon in the Snake and its tributaries upstream to the very brink. They can and must be removed quickly.

Pacific Rivers is a member of Save Our wild Salmon (SOS), a coalition that has focused since 1991 on recovery of the salmon of the Columbia and Snake River Basins. A top priority today is to secure a firm commitment to replace the services of the four Lower Snake River dams and restore a free-flowing river.

Decades of research and advocacy led to serious talks among regional leaders in recent years, which in turn led to a historic agreement last year and good momentum toward dam removal this year. This is the story of the past, present and future of the Lower Snake River (LSR) dams.

Location & Impacts

Located in Southeast Washington, the LSR dams are major obstacles for Snake River salmon. The habitat upstream of these dams includes over 5,000 miles of the Salmon and Clearwater Rivers in Idaho, the Grand Ronde River in Oregon, the Tucannon River in Washington, and their many clean, cool, high-elevation tributaries. These river basins include vast mountain ranges and wilderness areas; their salmon habitat is some of the highest quality and most climate-resilient left in the lower 48 states.

But salmon cannot get safely to and from it today.

Northwest salmon and steelhead all swim in the same ocean, but their mortality rates increase significantly with the number of dams and reservoirs they encounter. Endangered Snake River salmon and steelhead must



Salmon Habitat Map. Courtesy of Our Northwest Opportunity.

traverse eight reservoirs created by federal dams on their migration to the ocean and again on their journey back upstream as adults. They suffer higher mortality rates and lower smolt-to-adult return ratios than salmon that spawn in other parts of the Columbia River Basin.

Snake River salmon runs plummeted after the completion of the first of the four dams (Ice Harbor Dam) in 1962. They have fluctuated since in response to positive factors including habitat and flow improvements and negative factors including periodic poor ocean conditions and advancing climate change. The constants have been difficulties each and every year for salmon migrating through these four dams and the 140 miles of still, hot water behind them. Despite billions of dollars spent on projects to improve other conditions for salmon upstream and down from these four dams, Snake River salmon populations have never come close to their recovery goals.

In 1992, Snake River spring/summer Chinook salmon were placed on the federal endangered species list. Since then, numbers of returning adults have continued to fluctuate, with some years better than others, but the long-term trends have been deeply troubling. In its 2023 Status of the Species report on Snake River spring/summer Chinook salmon, the National Marine Fisheries Service stated "*...The consistent and sharp declines in 15-year population trends for all populations are concerning...Productivity is below recovery objectives for all of the populations and has been below replacement for nearly all populations since 2012...The vast majority of the extant populations are considered to be at high risk of extinction.*"

The decline of salmon upstream of the LSR dams has harmed more than 100 other species that depend on them, from bears in the Salmon River's high wilderness headwaters to orcas in the sea. Experts say there may

be just one or two generations of salmon left – in other words, less than a decade – to prevent a catastrophe for the salmon, ecosystems, people and cultures of the Northwest.

Recent Major Developments

2021

In February 2021, Idaho's Congressman Mike Simpson put forward a bold, comprehensive "Columbia Basin Initiative" proposal to save the region's endangered salmon and steelhead. It was designed to make whole all of the industries and communities in Idaho, Washington and Oregon that would be affected by removal of the LSR dams. Simpson's proposal was for $33 billion in regional investments in clean energy, efficient transportation, water quality, technology development, agriculture, and community development. Pacific Rivers did not think the proposal was perfect, but we did endorse it as a very important starting point for serious regional discussion, as it was by far the most specific and in-depth one yet offered by any public official for a comprehensive approach to saving the region's salmon.

In November 2021, Washington's Senator Cantwell and other regional leaders secured an initial $2.8 billion investment in salmon and ecosystem restoration projects as part of the bipartisan Infrastructure Investment and Jobs Act.

In late 2021, Washington's Senator Murray and Governor Inslee initiated a process *"…to examine whether there are reasonable means for replacing the benefits provided by the four Lower Snake River Dams, sufficient that breaching of the dams could be part of a comprehensive salmon recovery strategy for the Pacific Northwest."*

2022

In February, the Northwest Energy Coalition released a white paper titled "Smart Planning Will Drive Replacing the Power from Lower Snake River Dams". The Executive Summary stated "*The energy services of the four lower Snake River dams are important for the region, though increasingly variable due to climate change impacted water conditions. They can be replaced with a diverse set of clean energy technologies that will perform better and are rapidly declining in cost."* It also stated *"Clean energy resources in the region that are available or under development are more than sufficient to meet commitments to retire fossil fuel projects as well as replace the energy services of the four lower Snake River dams."* The full paper documented the basis for these conclusions in detail. It is well worth a read, as is the Northwest Power and Conservation Council's February 2024 update on the very impressive progress made toward our region's clean energy goals in the last several years.

In June, Senator Murray and Governor Inslee released a draft report to serve as a "platform for public input" throughout the remainder of their process, prior to making their recommendations about whether, when and how to breach the dams. The 118-page report stated clearly that replacing the benefits of the LSR dams is possible. It identified specific, detailed methods for doing so. The report's estimated range of total costs of those projects was from $10.3 to about $27.2 billion.

On August 25, Murray and Inselee issued a statement explaining their decision that all the benefits of the LSR dams should be replaced or at least mitigated before they would consider breaching to be feasible. While we had hoped for more from them at that point, we did take heart in much they had to say, including:

- *"While we have heard disagreement and intensity of feeling, we have also seen clear areas of common agreement. People of every perspective share a desire to see progress on the underlying issues and relief from the uncertainty created by litigation for the communities that rely on the river."*

- *"We have heard a new willingness to consider changes to the Lower Snake River Dams, in whole or in part, that would have been inconceivable just a few years ago. And we have heard universal recognition that protecting salmon, acting against climate change, strengthening our region's economy, and addressing the centuries of injustice visited upon the region's Tribes should be core components of any path forward."*
- *"The present moment affords us a vital opportunity to build on these areas of agreement, and we firmly believe that the region cannot afford another fifty years of confrontation, litigation, and acrimony over the Lower Snake River Dams."*
- *"There are clean energy generating resources moving their way through regional approval processes that, if built, will replace the generating capacity of these dams – severalfold, by some estimates."*
- *"Some assert that energy scarcity and environmental calamity are inevitable results of changing our approach to hydropower on the Lower Snake River Dams, and that doing so will derail the Pacific Northwest's decarbonization goals as we confront the climate crisis. We believe that is an oversimplified binary choice, and it is one that we do not accept or see as inevitable."*
- *"The clean energy provided by the Lower Snake River Dams constitutes only a small fraction of the new generating and transmission capacity that our region must build – just over 3.4% according to the most recent E3 report. As such, replacing that capacity does not meaningfully alter what we must already accomplish."*
- *"Action is needed now to make breaching a viable future option."*

2023

Budgets reflect priorities. In April of last year, the Washington state legislature confirmed that Tribal treaty rights and saving lower Snake River salmon are important state priorities when it allocated $7.5 million in its 2023-25 budget to fund the planning to transition the energy, transportation, and irrigation services currently provided by the LSR dams.



In June 2021, Julian Matthews, Elliott Moffett and other members of the Nimiipuu (Nez Perce) Tribe gathered at Lower Granite Dam with stories about why a free-flowing river is critically important for Tribal sovereignty. Their messages were amplified with an illuminated banner that said "Honor Treaties" and spotlights projecting messages to save wild salmon, respect treaty rights, and remove the four dams on the Lower Snake. Photo by Ben Herndon.

Also last year – as a result of federal mediation to resolve decades of court battles among plaintiffs and the U.S. Army Corps of engineers – six sovereigns signed an historic agreement for a collective Columbia Basin Restoration Initiative (CBRI) – a comprehensive package of actions to address "*the urgency of the salmon, climate, energy, and Tribal justice crises facing the Columbia River Basin.*" The Six Sovereigns are the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Indian Reservation, the Nez Perce Tribe, the State of Oregon, and the State of Washington. One of six overarching strategies of the CBRI is to "*Replace the benefits of the LSR dams with due urgency to enable breaching to move forward, and ensure interim fish measures are adequate to minimize additional generational decline of fish populations.*"

In September, the White House announced a Presidential Memorandum which recognized that since its 1855 Treaty with the Nez Perce Tribe, the U.S. government's construction and operation of dams in the Columbia Basin has "*severely depleted fish populations"* and caused *"substantial harm to Tribal Nations and other communities reliant on salmon and steelhead."* President Biden stated that *"It is the policy of my Administration… to restore healthy and abundant salmon, steelhead, and other native fish populations in the Basin."*

On December 14, the Six Sovereigns announced that the Biden Administration had *"embraced the United States' treaty and trust obligations to Tribal nations, while also considering all other interests – energy consumers, irrigators, fishers, recreationalists, and farmers, to name a few."* The Administration announced a ten-year partnership of federal agencies with Tribes and States to *"restore wild salmon, expand clean energy production, increase resilience, and provide energy stability in the Columbia River Basin."* This partnership, accompanied by a set of commitments from the federal government, represent the first steps of implementing the CBRI.

2024

On February 23 of this year, leaders of the four Tribes, the governors of Oregon and Washington, and federal officials celebrated their CBRI agreement and an initial $1 billion investment in salmon restoration projects at a White House signing ceremony.

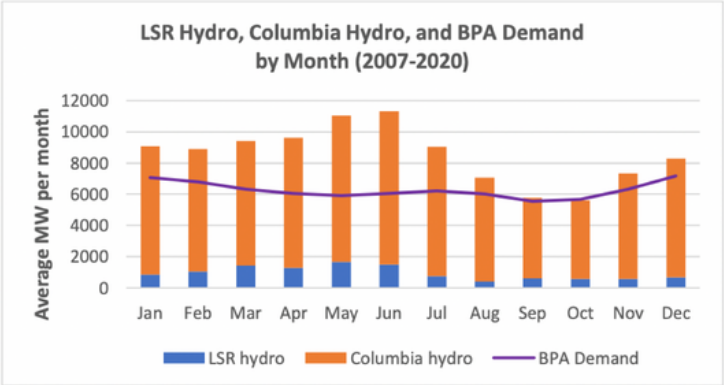
Looking Ahead and Countering the Falsehoods

These major developments over the last three years have created much new hope for removal of the LSR dams. However, much remains to be done to secure their breaching in time to recover Snake River salmon. Removal of these federal dams requires an act of Congress, where some members are strongly opposed.

We must continue to support those who are working hard to find solutions to the Snake River salmon crisis that are effective, comprehensive and timely. We also need to address mistaken ideas being circulated by some dam removal opponents. They include:

- *"We must keep all the hydropower we have to fight climate change, so we must not breach the LSR dams."* We agree with Murray and Inslee that this is an *"oversimplified binary choice."* Work already underway and committed will provide far more than enough power to replace that of the LSR dams. We can and must fight climate change and save salmon.
- *"There is no way to replace the value of these dams for flood control."* There is no value to replace. These dams were not constructed for flood control. They were constructed for barge transportation. They never have provided any significant flood control benefit. They never can.
- *"Removing the LSR dams will be a disaster for farmers in southeast Washington."* Only one of the four reservoirs is used for irrigation. Murray and Inslee are fully committed to replacing its irrigation capacity before dam breaching. Their report shows how.
- "*These dams are necessary for transportation of the region's products to market*." The Lower Snake is actually one of the least-used major navigable waterways in the United States. Barge traffic on it is heavily subsidized with taxpayer dollars. Even so, as other means of transport have become more economically competitive, barge traffic on the Lower Snake River has declined significantly over the last twenty-five years. This trend will accelerate with CBRI investments. Other regions bring products to market without killing species central to their identity, culture, economy and way of life. Ours can too.
- *"Wind, solar, battery and efficiency programs can't possibly replace the power the LSR dams provide."*

They already have, and much more is coming. The LSR dams produce an average of about 925 average megawatts (aMW) over the course of the year and can produce just over 2,200 megawatts (MW) for short periods. By comparison, between April 2000 and February 2024 alone, more than 41,000 MW of new wind, solar and battery power came on line in the Western Electric Coordinating Council region, allowing retirement of 4,164 MW of older (mainly gas) facilities with 36,929 new MW to spare — *40 times the average average output of the LSR dams, and more than 16 times their peak potential.* All in the last *four years.* With the West's energy transformation well underway and accelerating, the LSR dams can be retired as well, just as many other outdated power facilities already have been.



Save Our wild Salmon "The Truth About the Energy Output of the Lower Snake River Dams" Fact Sheet graphic.

- *"We need the steady power that these dams provide throughout the seasons more than ever today for baseload and for peak demands."* The small production of the LSR dams is not steady. It is highest in the spring, when other sources are abundant; in fact, BPA has a large regional excess of hydropower in the spring. The LSR dams are only capable of providing their most power when we can't even use it. We can do without them.
- *"My electric bills are already going up because the LSR dams are going away".* This is a new and very curious claim. Some electric utilities' rates are increasing — but the LSR dams are not yet breached, and no official decision about their fate has been made. Electric rates vary according to a great many factors at any given place and time. If one's electricity bill is going up, there are many far more plausible explanations than a possibility that the relatively small amount of power the LSR dams provide might go away someday. Indeed, the best thing for our regional electricity rates is to replace increasingly costly sources such as the LSR dams with less costly new ones – all considerations about salmon and climate change aside.
- *"The CBRI was a backroom deal".* It was the product of a mediation process through the Federal Mediation and Conciliation Service to pause decades of litigation over the Lower Snake River Dams. Mediation of disputes is a standard procedure in litigation. Now, two States and four Tribes are working together as never before to restore salmon. They need no permission to do so. Others are welcome to join the effort if they wish. We hope they will.



Photo courtesy of Backbone Campaign.

2024 promises to be another very important year in the race to save Snake River salmon. We will provide updates and action alerts by email and social media as there are developments and opportunities. Please stay tuned and get involved.



The Lovelace Dam on the Rogue River (removed 2023). Photo courtesy of WaterWatch of Oregon.

THE LOW-HANGING FRUIT OF LOWHEAD DAM REMOVALS



"The Pacific Northwest is simply this: wherever the salmon can get to. Rivers without salmon have lost the life source of the area."

— Timothy Egan

Lowhead dams are ubiquitous across the landscape. There are thousands of them, often uncatalogued, privately owned, decades old and in disrepair or just totally neglected. In the western states where agriculture relies on irrigation, irrigation dams account for between 44% (Colorado) and 59% (Oregon) of all dams. One-third of the dams in California and nearly half of the dams in Idaho primarily supply irrigation water (ASCE Lowhead Dam Nation Inventory) – many without water rights to retain water. These present excellent opportunities for restoration by removal.

Although removing a dam from a river isn't realistic in all cases – and many dams in the United States still provide valuable water storage (and maintain water rights), hydropower, recreation, and other benefits – thousands of aging dams all over the country are in disrepair and no longer provide valuable services. In a study conducted on 30 dams in Massachusetts, it was shown that the cost to maintain those dams over time was 60% more expensive than removing them (IEC 2015). Keeping the dams in place, especially those of limited use and in poor condition, just simply to maintain the status quo, will often actually cost the dam owner considerably more than taking them out – especially the many small dams in the west that are in place only for agricultural diversions. There are much cheaper and more effective ways to provide water than keeping in place a structure that is at risk of failure, which becomes more of a distinct possibility as dams age.



Charles City Whitewater Park
Photo courtesy of Charles City Area Chamber of Commerce.

Lowhead dams are generally considered to be 15 feet tall or smaller. Most are channel-spanning. They fragment river ecosystems and disrupt access of native fishes to their ancestral spawning habitat. Similar to large dams, the sediment retention behind small dams can cause a cascade of impacts in the river below, including scouring spawnable gravels from the river bed, incising the channel and causing incision to propagate up into tributaries, leading to passage barriers and undermining at road crossings, eating away riverbanks, etc. These small dams, though they may appear innocuous, can also be a serious risk to river users. Many create recirculating currents in the stream that can be deadly, tragically resulting in about 50 drownings per year across the US. Many states with active and enforcing dam safety

taskforces have been spurred into action due to fatalities of river users.

Due to their small height and lack of water storage, lowhead dams have slipped through the cracks in dam safety management. Most states do not have an inventory or risk assessment in place; and those that do, typically do not include smaller structures. Oregon's Inventory by the Water Resource Department, does not contain dams smaller than 10 ft high. Washington State's Dam Safety Office (DSO) has inventoried 1,242 dams in Washington and small dams (0-14 ft high) account for 580 of those. In California, if the dam height is more than 6 feet, it will be under the jurisdictional oversight of California Department of Water Resources. In Idaho, hydraulic structures greater than or equal to ten feet and their reservoirs are regulated by the Idaho Department of Water Resources Dam Safety Program. This means many smaller dams are unaccounted for, unmonitored, and could be deteriorating in place.

Each dam is different, but in general, removing small dams can be much less expensive and lower risk than removing large ones, and the benefits to native species can be as significant. By allowing the waterway to flow naturally, lowhead dam removal can improve water quality, improve flows and hydrology downstream, restore habitat and access to the upper watershed, and open up myriad recreational opportunities.



The Gold Hill Dam on the Rogue River (removed in 2008). Photo by Thomas O'Keefe, American Whitewater.

It shouldn't take drownings to motivate dam removal. It's time to be proactive. Correcting the factors that sideline dam removal as an option – most importantly, the limited enforcement of dam safety regulations, limited advocacy and inadequate funding for dam removals – will lead to even more success stories that can benefit us all. Please reach out to us for more information about removing infrastructure on your property, funding opportunities, or to report a deteriorating dam.

REFERENCES:

Association of State Dam Safety Officials, Dam Incident Database Search, https://damsafety.org/Incidents

IEC 2015. Economic and Community Benefits From Stream Barrier Removal Projects in Massachusetts. Prepared by Industrial Economics, Incorporated. Prepared for Massachusetts Department of Fish and Game, Division of Ecological Restoration.

American Society of Civil Engineers, National Inventory of Low Head Dams, https://www.asce.org/communities/institutes-and-technical-groups/environmental-and-water-resources-institute/national-inventory-of-low-head-dams

USGS Dam Removal Information Portal (DRIP). https://www.usgs.gov/tools/usgs-dam-removal-information-portal-drip

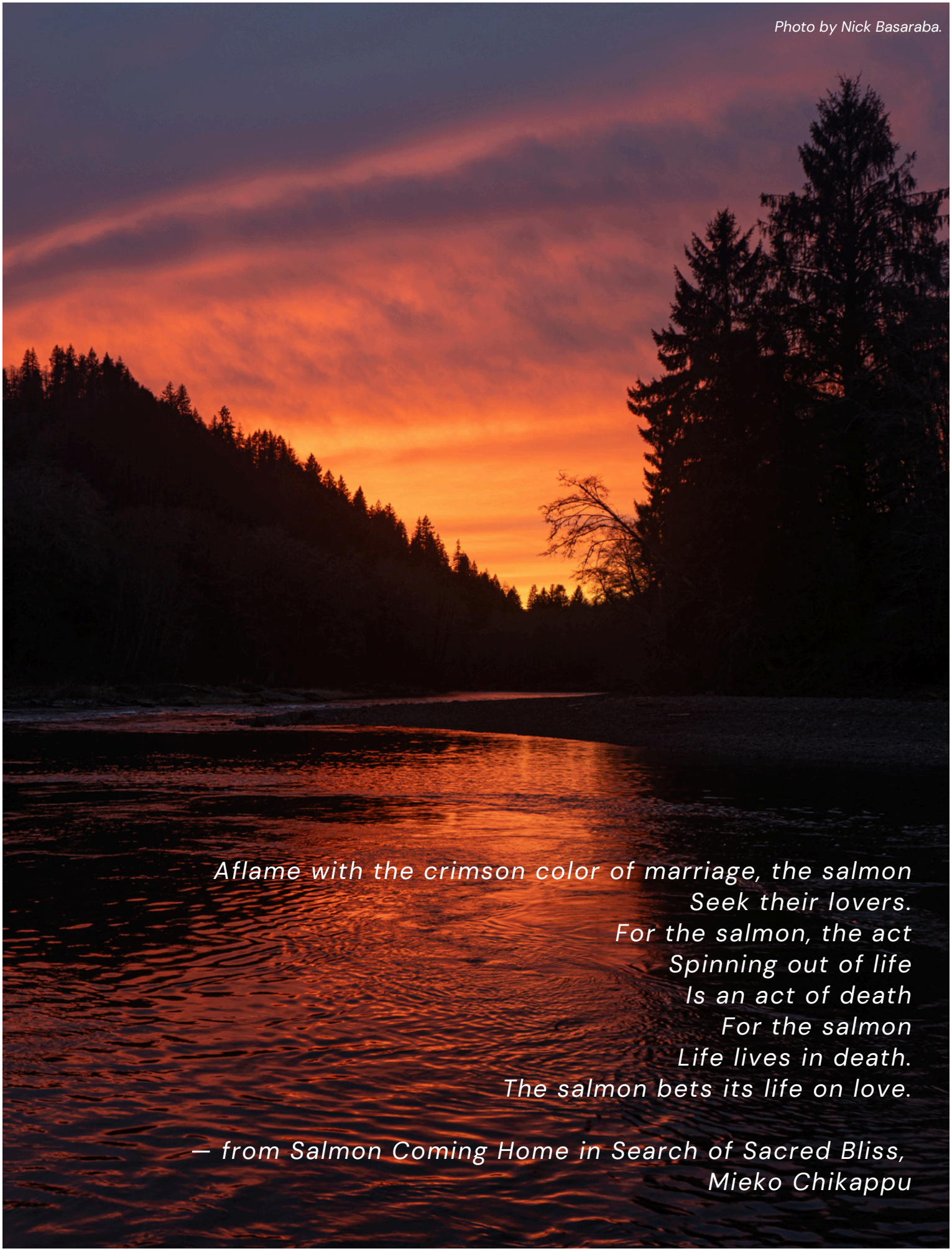


Photo by Nick Basaraba.

Aflame with the crimson color of marriage, the salmon
Seek their lovers.
For the salmon, the act
Spinning out of life
Is an act of death
For the salmon
Life lives in death.
The salmon bets its life on love.

— from Salmon Coming Home in Search of Sacred Bliss,
Mieko Chikappu

PARTNER HIGHLIGHT:

WATER QUALITY PROTECTIONS GRANTED TO THE GREEN RIVER

by Ashley Short, Cascade Forest Conservancy Policy Manager

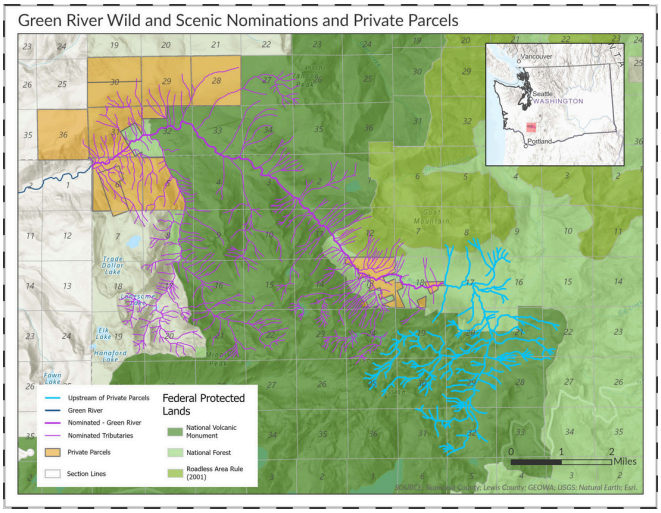


View of the old-growth Green River Valley. Photo courtesy of Cascade Forest Conservancy.

On December 18, 2023 the Washington Department of Ecology designated the upper portions of the Green River near Mount St. Helens as Outstanding Resource Waters (ORW) under the Clean Water Act. This designation was a culmination of over two years of outreach and work by a coalition of groups, including members of the Green River Valley Alliance (GRVA), to designate three rivers as the first Outstanding Resource Waters in Washington state.

An ORW designation is a tool under the Clean Water Act that protects unique and high quality waters by preventing new pollution. This protection is particularly helpful towards the GRVA's long-term efforts to protect the Green River Valley from mining. While these new protections do not explicitly prevent mining in this area, they will at the very least make developing a mine more difficult and costly. Any permit applicant for a new mine would need to be able to prove that it would not impact water quality at all.

Although ORW status will serve as a strong deterrent to future attempts to mine on the Upper Green and provide an additional layer of legal protection, the GRVA is still working on procuring long-term permanent protections against mining – a mineral withdrawal. A mineral withdrawal is a land use tool that prohibits mining in a given area and can be done administratively for up to 20 years or permanently through Congress. A withdrawal is a more straightforward protection against mining than an ORW – which is why procuring one remains a goal and priority for the GRVA.



Map courtesy of Skamania County; Lewis County; GEOWA; USGS; Natural Earth; Esri.

For the last two years, the GRVA has been growing in numbers to demonstrate to our Washington Congressional Representatives and the Administration that there is vast public support for protecting the Green River Valley from mining. This grassroots work resulted in a coalition of 98 local organizations and businesses formally requesting a legislative mineral withdrawal from Congress in September of 2023.

Although the coalition had high hopes of seeing movement during this Congress in response to our letter, the congressional outlook has since changed. With the upcoming election, budget work, and other priorities, it seems unlikely that a mineral withdrawal bill for the Green River Valley near Mount St. Helens would move this year. Therefore, the GRVA is shifting focus to obtaining an administrative withdrawal while we wait to see what happens in Congress.

Pacific Rivers is an Alliance Partner of the Green River Valley Alliance. Learn more here: www.greenrivervalleyalliance.org

HOLLY SPENCER APPRECIATION



We are deeply saddened to report that Holly Spencer, who worked for Pacific Rivers from 1989 to 2008, passed away on January 7, 2024. Holly served in many roles during her nineteen-year tenure, notably as our grant writer, and ultimately as our associate director.

Holly secured countless grants for Pacific Rivers, including the largest grants that Pacific Rivers ever received. She had superb writing and editorial skills, and a gift for blending text from multiple Pacific Rivers staffers into coherent documents. Her writing was noteworthy for its logical flow and persuasive voice, as well as for its elegantly lean style. *Free Flow* blossomed under her leadership into the substantive and visually beautiful publication that it is today.

Her organizational and communication skills were vital not only in helping what was the Oregon Rivers Council morph into the then Pacific Rivers Council, but in making key contributions at critical points along the way. Holly handled it all with grace: leadership changes, funding shortfalls, management of staff and contractors in six-plus locations thousands of miles apart, events with three keynote speakers, and multiple office moves.

Holly had an ebullient spirit, which she brought to work with her every day, much to the benefit of the rest of us. We fondly remember the "chocolate drawer" in her desk, which was available to anyone, at any time of day. She made a point of observing the birthdays of all staff members, typically with small and comical gifts.

Holly once planned a staff Christmas dinner at a Eugene restaurant that included small plastic salmonids that could be discreetly filled from our glasses for some satisfying precision water-fighting. A playful and very fine time was had by all.

We posit that in every successful small organization, there is one individual who stands out for not only doing her (or occasionally his) job with wonderful competence, but also as someone who cares deeply for, and is ever mindful of and attentive to the feelings, struggles, and successes of co-workers. This kind of warmth and caring makes a profound difference, and having someone who naturally fulfills that role – regardless of job title and specified duties – is necessary for any small organization to sustain itself and flourish. Holly was "that person" at Pacific Rivers.

Holly cared deeply about rivers and the natural world, and she cherished the time she spent camping along Steamboat Creek with her family and friends. She is survived by her two children, Lewis and Bailey, who are as dedicated to making the world a better place as she was. There will be a celebration of life for Holly on Friday, June 14th at 7 pm at Sweet Cheeks Winery, outside of Eugene.

— Rebecca Daniels, Mary Scurlock and Chris Frissell

THANK YOU FOR YOUR SUPPORT!

We want to thank our many supporters for giving us the information, inspiration, motivation, and yes, funding, to tackle the most important river and watershed issues of our day. We could not do it without you.

OUR MISSION

The mission of Pacific Rivers is to protect and restore the watershed ecosystems of the West to ensure river health, biodiversity and clean water for present and future generations.

OUR VISION

A future where healthy communities have access to clean, cool drinking water free from chemicals, and people can play in rivers and streams. A future where watersheds that store carbon are resilient to warming temperatures and other effects of climate change and are home to abundant populations of fish and aquatic wildlife.

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