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UPSTREAM SOLUTIONS: PROTECTING WATER FOR THE WEST

In the heart of Colorado's Rocky Mountains, dedicated teams are restoring a fire-scarred landscape and creating a more resilient future.

In 2020, the East Troublesome Fire tore through Grand County, a high-country region that includes the headwaters of the Colorado River. Following years of extreme drought and a severe epidemic of bark beetles that destroyed wide swaths of trees, the explosive blaze scorched forests and sent a torrent of sediment into the rivers and reservoirs below. It was one of two giant wildfires that collectively burned over 400,000 acres of wilderness that season, leaving the region's ecosystems – and a water supply that reaches 40 million Americans – in peril.

"It's not like we didn't know there would eventually be fires in our watersheds, but no one envisioned something on that scale," says Esther Vincent, director of environmental services at Northern Water.

While wildfires are natural – and sometimes necessary for forest renewal – the desiccated landscape supercharged the damage, leaving behind a charred valley even more vulnerable to flash floods and water-quality decline.

To restore the landscape and make it more resilient to future fires, groups including National Forest Foundation, Northern Water, Trout Unlimited and the U.S. Forest Service are using nature-based solutions inspired by beaver dams to rehydrate the landscape.

The team is building beaver dam analogs, simulated beaver structures and post-assisted log structures – simple, nature-based methods that mimic beaver dams by intertwining wood and soil to slow the flow of water in rivers and streams. The low-tech structures catch sediment flowing downstream, raise the water table and spread water across the floodplain, encouraging the return of soggy, willow-lined wetlands.

THE GOAL IS TO RETURN THE AREA TO ITS LUSH PAST, COMPLETE WITH THE MEADOWS AND WILLOWS THAT USED TO PROTECT THE VALLEY AND REGULATE WATER FLOW.

Combined with forest management strategies like targeted thinning in the national forest, these solutions are rebuilding the region's ability to hold water and resist future fires.

Already, the work is paying off, with thousands of tons of sediment from fire runoff piling up against the new wood structures and raising the stream beds, in some places by two or three feet.

"You can see the difference between this year and last year... and it's

happening faster than we thought," says Sean Henry, an environmental planning department manager at Northern Water.

These stream restoration techniques are healing the fire-scarred watershed and transforming it into a living buffer against the next blaze. At a time when wildfires are becoming more frequent, that effort is urgent.

"We don't have decades to plan for this and then start implementation 30 years from now," says Vincent. "We need to take action on the ground much faster than that."

In the nearby Kawuneeche Valley in Rocky Mountain National Park, these same strategies are used not to recover from wildfire, but to make the land more resilient to future threats.

Half a century ago, the Kawuneeche Valley was a lush, living sponge. Home to an extensive and vibrant beaver meadow complex, it was covered with rushing pond systems and dense willows that slowed snowmelt and sustained the flow of water through dry seasons, feeding the mighty Colorado River. But decades of human and wildlife impact, as well as changing river and climate dynamics, degraded the landscape. Over time, as willow and beaver populations declined and the valley dried and eroded, the landscape left behind was vulnerable to both flood and fire.

The Kawuneeche Valley Restoration Collaborative is working to return the area to its lush past, complete with the meadows and willows that used to protect the valley and regulate water flow.



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Comprised of Colorado State University, Grand County, the National Park Service - Rocky Mountain National Park, The Nature Conservancy, Northern Water, Rocky Mountain Conservancy, the town of Grand Lake and the U.S. Forest Service, the collaborative is implementing strategies that both mimic the benefits of beaver dams and possibly entice nearby beaver communities to move back in in the future to maintain the structures.

The beauty of this nature-based approach lies in its simplicity – working with natural elements so ecosystems restore themselves. It’s a way of helping the ecosystem remember what it was – and begin again.

“It’s hard to mess things up too badly when you just put wood and soil in the stream channel,” says Jeremy Shaw, a wetland ecologist at Colorado State University and a member of the research team managing the

restoration project. “We’re trying to use the softest approach possible to accomplish the goal – and the goal is to reinstate natural processes in a self-sustaining way.”

Their work to restore the valley has a range of added benefits. By slowing water and reconnecting it with the floodplain, the project also makes the water clean and clear – critical elements for millions of downstream users who depend on the Colorado River for drinking water, agriculture and recreational activities like rafting and fishing. This range of impacts has made the project popular with an array of local groups and nearby communities, bringing together diverse stakeholders around a shared goal.

“Just knowing that we’re going to be able to do something that cumulatively has a good impact on water quality, water quantity, the environment – it’s a pretty exciting time out there,” says Henry.