

# Riffles

FALL 2019 FIELD UPDATE



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## Busy, Beleaguered, Beloved: BEAVER IN THE CLARK FORK

- *The truth is out: The famously busy beaver is an incredible watershed ally and climate resilience hero that can deliver enormous benefits to fisheries, forests, and floodplains. For good reason, beaver are a pretty hot ticket in stream restoration circles these days.*
- *But realizing those benefits isn't as simple as deploying a fleet of furbearers into the wilds to work their magic. Beaver in a landscape raise complex issues, such as their impacts on native fisheries and their interactions with people and the built environment.*
- ***This issue of Riffles discusses the work of CFC and its partners to answer some basic beaver questions, and to tackle some not-so-basic management challenges. We'll start with a deeper dive into the myriad ways beaver help rivers and fisheries.***

## REDEEMING THE DAMMED .....

### ..... How Beavers Help Rivers and Fisheries By Kara Cromwell

There's no doubt about it: beavers make a mess. They cut down, uproot, waterlog and overflow. We have historically been more interested in clothing ourselves with beavers than coexisting with them on the landscape.

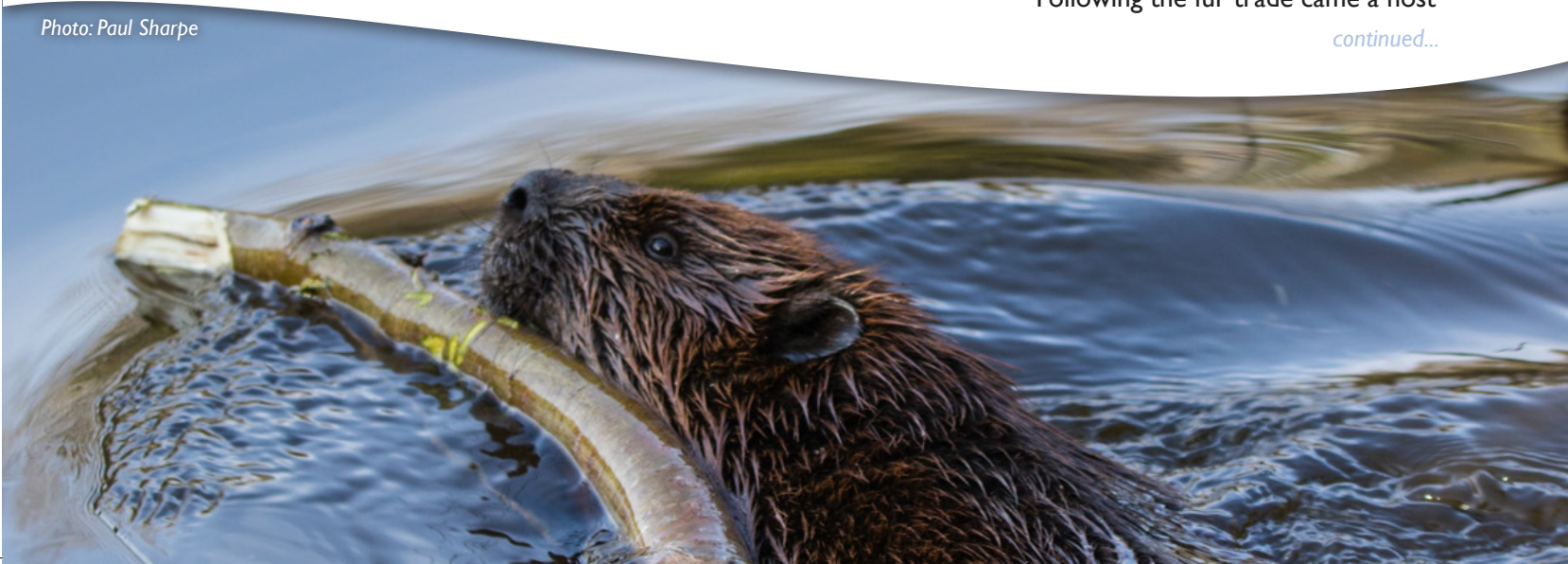
But like so many ecological realities, the truth about beavers isn't simple. To understand beavers, you have to wade in deeper. Part the brush, peer through, and pick out the overgrown path between cause and effect—the changes beaver cause when they engineer a landscape, and the effects those changes

have on the natural resources we cherish.

Scientists estimate that the number of beavers in North America is less than 5% of what it was before European fur traders (having decimated their own native beaver populations) crossed the Atlantic. Following the fur trade came a host

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Photo: Paul Sharpe



of changes to watersheds—clearing forests, removing wood debris from streams, diverting flow to drain and cultivate valley bottoms. Rivers were restricted to simplified channels and denied access to their floodplains. Along with removing beavers, this great effort at tidying up led to an unprecedented drying out of the western landscape.

Today we talk a lot about keeping water cold and clean to sustain our native fish populations. Let's think through the separate pieces of that goal, starting at the beginning: water. For fish populations everything depends on water flowing through the watershed. And—this is the key point—not just rushing down the main channel. Fish need water in the small tributaries that deliver snowmelt from the mountain tops. They need water in side channels. In backwaters. In pools. Water that slows and lingers in the floodplain instead of high-tailing it to the ocean.

Nothing teaches water patience like a beaver. Beaver dams coax water to slow down, relax, drop the burden of eroded sediment it's been carrying (which also makes it clean), sink below ground, and spend time mingling with the aquifer (which also makes it cold), and stay awhile in the uplands. "Water storage" and "sediment storage" are what scientists call these services, and they go hand-in-hand with another key ingredient: "habitat complexity."

What does complexity mean in a stream? Just like humans, fish need food, shelter and safety at all stages of life, from fry to fifteen-pounders. To the human eye the entrenched and entangled mass of plant parts that beavers create looks like chaos. But fish would disagree. In the sheltered side channel there is a nursery. The undercut bank offers a dining nook. The deep pool is a temperature-controlled refuge from summer heat and winter cold.

That messiness works well for fish. Numerous studies have found that beavers increase the amount of fish a stream produces. There's more than one path to this outcome, but the basics include a combination of increasing fish size, abundance, and survival. All of these paths stem from the same starting point: habitat quantity (remember water storage?) and quality. Fish need a suite of diverse habitat types connected by

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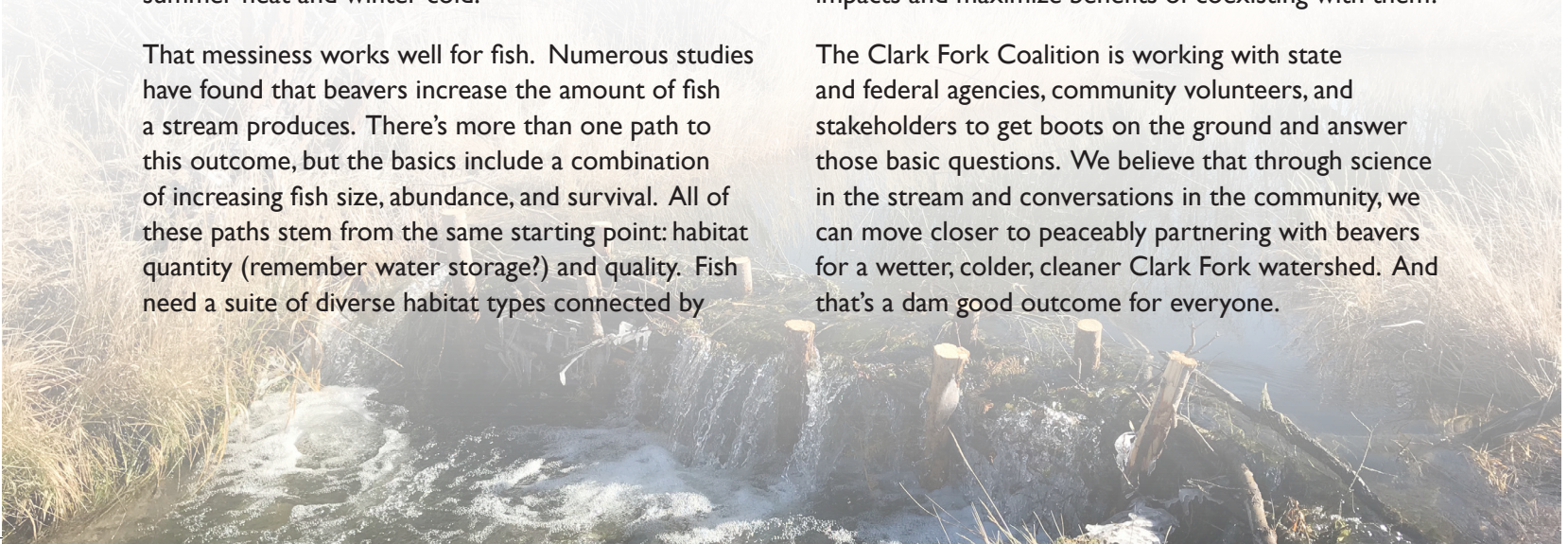
water that is ample, cold and clean. And beavers can give it to them.

But for all these benefits, human communities remain entangled in a dilemma with beavers, as the things beavers do that benefit fish are exactly the things that can disrupt human infrastructure—like felling trees and engineering landscapes to retain and redistribute water. A beaver dam might mean a new pool for fish, but for a landowner it can mean a blocked culvert, a flooded or damaged road, and the time and expense to fix it all.

To unthread this tangle let's back out of the thicket and take in a broader, landscape view. A watershed shared with beavers is just plain wetter. And in a warming West, keeping watersheds wet is a crucial challenge. The current symptoms of water scarcity in the Clark Fork basin are expected to escalate—more frequent droughts, more intense fires, and chronic dewatering of tributary streams. We can't make more water. But we can have more water on the landscape if we capitalize on opportunities to increase water storage. And that's precisely where beaver can help.

That is the big picture Clark Fork Coalition and partners are focused on: finding paths toward a win-win-win scenario for a landscape shared by humans, fish, and beavers. As specialists in water storage, beavers may offer solutions to some of our most pressing problems. But finding a workable balance starts with asking: where are beavers present? Where were they historically? What habitats are suitable for their use now? What are the best ways to reduce impacts and maximize benefits of coexisting with them?

The Clark Fork Coalition is working with state and federal agencies, community volunteers, and stakeholders to get boots on the ground and answer those basic questions. We believe that through science in the stream and conversations in the community, we can move closer to peaceably partnering with beavers for a wetter, colder, cleaner Clark Fork watershed. And that's a dam good outcome for everyone.



## From Eradication to Mitigation •• REDUCING BEAVER-HUMAN CONFLICTS •••••

**Mention beaver to many landowners and be ready for an earful.** Loss of valuable trees. Blocked culverts. Clogged irrigation ditches. Washed-out roads. Flooded fields. With such messy and costly impacts—from critters all too happy to rebuild no matter how many times their handiwork is removed—it’s no wonder the go-to management option has been trapping and killing. Good-bye beaver, but good-bye benefits, too. What’s the solution?

Enter the **Beaver Conflict Mitigation Pilot Project**, a partnership effort rolled out last May by CFC, Defenders of Wildlife, and the National Wildlife Federation. The goal of the program is to build more tolerance for beaver by reducing beaver-related conflicts using innovative techniques and simple in-stream fixes. Beaver Technician, Elissa Chott, reaches out to landowners, land managers, and others who are experiencing problems with beaver; determines if a non-lethal solution is possible and if so, which one; looks for cost-share opportunities to implement the solution; and gets to work.

Fixes vary by project site, but all of them are non-lethal and decidedly low-tech:

- **Culvert exclusion fencing** consists of long fences installed on the upstream opening of culverts that keep beaver away from the stimulating sound of running water. This prevents dam-creation by forcing any building away from the opening—a big turn-off for beaver. (Also called “Beaver Deceivers™” “beaver bafflers” and other names.)
- **Tree-wrapping** involves surrounding the trunks of mature trees, or groups of saplings, with rolled metal fencing that keeps beavers at bay, forcing them to go elsewhere for building material.
- **Pond-levelers** work in sync with active beaver dams and entail submerging a simple, flexible pipe in the pond and running it through the dam so that, rather than flooding, the pond will begin to drain when it reaches bank height (or other desired depth). Various strategies are used on the pond end of the pipe so beavers don’t get any wild ideas about putting a dam on that, too.

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## LOOKING FOR ANSWERS ON THE LOLO

Imagine managing a two-million-acre forest where climate change, drought, and chronically-low stream flows perennially threaten catastrophic wildfire, decline in fisheries, and degraded water quality. Add shrinking budgets to the mix and you can see why the Lolo National Forest (LNF) has been thinking for some time about how beavers or beaver mimicry—both effective and affordable options—could help. Part of that thinking has been conferring with experts, analyzing feasibility, and determining where beaver were, are, could be, or shouldn’t be (see pg. 4).

This summer the LNF, CFC, and University of Montana researchers took a big step toward answering some key remaining questions by launching a multi-year field study to explore if and how more beaver, or beaver mimicry (such as beaver dam analogs, or BDAs), might negatively impact native fish populations by improving conditions for their competitors. We know beaver and BDAs benefit fish (see main article), but do they give non-natives a fin up? This research project will find out by comparing temperature, fish populations, fish movement, and other parameters in several BDA and non-BDA study sites in the Blackfoot and Lolo drainages.

Beaver occupy only 15% of their historic range in the LNF. Could bringing them back, or mimicking the services they once provided, help address some of today’s management challenges? Now we’ve got the boots on the ground to find out. **Stay tuned.**

The first step of the project was to research and then map reported conflict areas in Montana Fish Wildlife and Parks' (FWP) Region 2 (west-central Montana). We quickly identified potential project sites in Missoula, Lolo, Seeley Lake, Ovando, and Anaconda. Next, we developed several projects that can serve as demonstration sites for non-lethal beaver management, including:

- Tree-wrapping at Anaconda Golf Course
- Tree-wrapping at Kelly Island and Sha-Ron fishing access sites near Missoula (FWP helped install, and provided signage about beaver benefits and the goals of this project)
- Pond-leveler and culvert exclusion fencing at Lost Creek State Park near Anaconda (built by conservation and agency partners at a beaver conflict mitigation workshop hosted by this program in September)
- Pond-leveler in Washoe State Park

The pilot project also includes a training component for partner organizations, such as watershed groups and land trusts, to teach them about beaver biology and

basic beaver conflict mitigation techniques.

A key partner in this effort is Montana FWP, the agency responsible for managing beavers in the state, whether they are found on public or private land. FWP has spent decades on the receiving end of angry phone calls from landowners impacted by beavers' tree-cutting and pond-building. Finally the agency has a relief valve, as they can refer willing landowners to this program to learn what their options are, and to find out how those furry intruders might actually be able to improve the health of their properties. For its part, FWP tells us they're happy to finally have more options than issuing more kill permits or trapping more beaver.

As climate change and other stressors push our rivers and streams to the brink, we need the highly-effective, if somewhat messy, solutions beaver can deliver. But we don't have to offer up clogged culverts and flooded fields to the beaver gods to earn them. With a little creative intervention, we can give these ecosystem engineers the space they need to keep our waters clean, our fisheries healthy, and our watershed resilient for the long haul.

## CITIZEN SCIENTISTS

### As Busy as the Beaver They Study

We wrapped up our second season of Beaver Habitat Surveys with Montana Conservation Corps youth crews. This year was especially exciting because of the \$25k in funding we received through the United States Forest Service's competitive Citizen Science grant program. As a result, we were able to stock up on new tools, waders, and supplies, and ensure that our student crews (consisting of 36 kids total) were properly geared up for some intensive field work.

From a data collection standpoint, it was an incredibly productive summer: students surveyed over 14 miles of stream and studied 175 data points to determine where beaver used to be, where they are, and where they could be now, but aren't. These questions are key to Lolo National Forest (LNF) land managers as they look to reduce weeds and fire risk, and affordably return key watersheds to more historic conditions. We also collaborated with the Montana Wildlife Federation and Artemis Sportswomen group



to train and deploy sportsmen and women in our Beaver Citizen Science efforts. Nearly 15 volunteers received intensive training from CFC in stream ecology, beaver natural history, and data collection through a combination of classroom, field, and online training. We are now analyzing the data for a final report to be delivered to LNF this fall to aid in their land management decisions.