

Riffles

SUMMER 2019 FIELD UPDATE



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TROUT TRIALS AND TRIBS

Living in the Clark Fork watershed means living with rivers and their mountain-fed creeks and streams. We cross their glistening waters every day. We watch them rise in the spring and fall in the summer. We capture their flows to grow food and feed livestock. We fish them, float them, and sometimes we fear them. And because of the Clark Fork's hard-working past and a climate-stressed future, we need to ensure we work hard to repair and care for them.

That work has been underway for decades and takes many forms. But

how do we know if it's working, and how do we remain alert to lingering and emerging issues?

Just track the fish.

The fish that live in the Clark Fork watershed – particularly its native westslope cutthroat and bull trout – make an excellent barometer of stream health. They are sensitive to changes in environment, they require clean, cold, complex, and connected habitats, and they respond to pollution and stresses in predictable ways. They are the classic “canary in the coal mine.” So

we know that when we improve conditions in our fisheries – such as by removing pollutants, adding shade and riparian vegetation, eliminating migration barriers, and enhancing flows – we're boosting the health and resilience of our rivers and streams too.

In this edition of *Riffles* we look at some of the primary challenges impacting Montana's wild and native trout across the basin, and the fixes underway that you've helped make possible.





“Perched” and undersized culverts like this one are a major barrier to fish trying to move upstream. Even if fish could make the vertical leap, the high-velocity flow inside the culvert is often too much for them to overcome.



Entering Lolo Ditch is easy – it’s getting back out that can be tough. A new fish screen will help keep trout out of trouble.

TOO MANY BARRIERS

Like the old song says, fish gotta swim. And they need barrier-free river systems to do it. Trout need to move seasonally to find food, escape predators, migrate to and from spawning grounds, access favorable habitat, and seek cool refuge when water temperatures rise. They run into trouble when problematic culverts become insurmountable obstacles (see photo above), when low flows cut off tributaries from mainstems, and when irrigation infrastructure stands in the way. They also struggle when they follow the flow into large irrigation ditches from which they can’t escape.

— What we’re doing: —

Lolo Ditch Fish Screen

One of the largest irrigation diversions in the Bitterroot watershed, Lolo Ditch captures as much as 75% of Lolo Creek during low flows. The irresistible lure of all that water traps an estimated 10,000 fish (and possibly more) each year when the ditch is turned off. We’re installing a low-maintenance, high-flow fish screen that allows water into the ditch, but keeps fish in the creek – a fix that will immediately improve conditions on what state fisheries biologists consider one of the highest-priority diversions in the Middle and Lower Clark Fork watersheds. *(Work underway; construction likely in 2020.)*

Cottonwood Creek Fish Passage Projects

The upper reaches of the Cottonwood Creek drainage provide outstanding habitat, but fish encounter a lot of obstacles trying to get there. We’re installing a new fish-friendly culvert, upgrading an irrigation diversion to allow fish passage, rebuilding a degraded section of stream, and installing

a fish screen to prevent ditch entrainment. When the dust settles, Upper Clark Fork native trout will have vastly-improved access to more than 15 miles of clean, cold, headwaters habitat. *(Expected completion: fall 2019.)*

Keeping More Water in Creeks

Lack of water is as much a barrier to fish as any dam. We work with landowners basin-wide on voluntary water right acquisitions and leases to help keep vital tributaries wet, cool, and connected. For example, we can assist ranchers in upgrading irrigation infrastructure, or compensate agricultural producers for changing late season irrigation patterns, which then allows them to leave more water instream while still meeting operational and fiscal needs. A single instream flow project can be the difference between a creek flowing all summer, or running dry and blocking fish from the cool upstream refuge they need. *(Multiple projects underway; also see sidebar, next page.)*



Fish-friendly “stream simulation” culverts like this one allow trout to easily migrate up- and downstream.



Landowners are key to keeping water in creeks. On Lost Creek, above, a local rancher established a split season lease that leaves enough water in the creek in summer to keep this important trout spawning stream connected to the Clark Fork year-round.

DEGRADED HABITAT

Montana's hard-working rivers have always sustained us, but the scars of that service run deep, wide, and right through the heart of trout country. We've moved, straightened, dredged, mined, rip-rapped, dammed, spanned, and otherwise altered them in countless ways. Our cows, cars, and cities have deeply impacted them too. The results are often bad news for fish: loss of protective pools and shade cover, increased erosion, loss of floodplain connectivity and complexity, chronic de-watering, dangerously high water temperatures, loss of wetlands and side channels, trampled spawning areas, and more.

— *What we're doing:* —

Miller Creek Restoration

Along the south edge of Missoula flows an extremely important Bitterroot tributary supporting a population of pure-strain native westslope cutthroat trout. But it's seen better days. We're fixing incised and eroding stream banks, restoring meanders, increasing wetlands, and planting riparian vegetation to improve the health and resilience of this vital native trout stronghold. *(Projects begin in fall 2019.)*

Dry Cottonwood Creek Habitat Improvement

This Upper Clark Fork tributary supports a conservation population of native westslope cutthroat, but livestock trampling in key tributaries and a highly erosive road along its length have caused excessive siltation and degradation of spawning habitat. We're installing fencing and other barriers to keep the cows out, and maintaining catchments to prevent a never-ending source of road sediment from clogging the creek. Fish-friendly culverts installed last fall provide new access to upstream spawning habitat; these projects help ensure that habitat is in good shape when the fish arrive. *(Projects continue during 2019.)*



LAWS, PROCESSES, POLICIES: THE EXCITING STUFF BEHIND THE SCENES

Changing irrigation practices so that more water can stay instream is a powerful win-win solution to de-watering. But there's a bit more to it. To keep water instream, it must be legally protected. In Montana that means applying to the Montana Dept. of Natural Resources and Conservation (DNRC) to change a water right from its previous use to "instream flow." This "change application" process is a big part of CFC's flow restoration work – and we know from experience that it can be both challenging and time-consuming. To make it as easy as possible for water rights holders to help local creeks, we're advocating for improvements to, and streamlining of, the process to help lower those procedural barriers.

We're also working to ensure that water policies themselves – and how they are applied – do not impede water conservation efforts. For example, in response to a 2016 CFC change application, DNRC decided that just 17% of the water right in question could be protected for instream flow. We found no legal or logical reason for the decision, it wasn't enough water to actually help the creek, and the precedent was troubling. So we challenged the decision. In April 2019 the Montana Water Court agreed with us, ordering the agency to grant our instream flow request in full. We don't yet know if the ruling will change future decision-making on instream flow projects, but it ensures instream flow protection remains a viable tool to help depleted creeks.

Finally, after instream flow is secured and then protected, we need to ensure that the water that's supposed to be in the creek is actually there. To keep tabs, and to track stream vital signs while we're at it, CFC regularly monitors some 35 sites on nearly 20 streams throughout the summer. That regular check-in allows us to take action if needed, catch new problems quickly if and when they arise, and to develop new projects.

We understand that this behind-the-scenes stuff can sound pretty dry. But it's essential to putting water back instream, which remains one of the most effective ways to improve the health, vitality, and resilience of our waterways. And there's nothing dry about a re-watered creek.

Forest Road Decommissioning

In some parts of the Clark Fork basin, past timber cutting has left a spaghetti bowl of old roads, most of them long since closed. But they remain silt and sediment factories (especially in places with highly-erosive soils, like the Bitterroot), continually clogging stream beds and inhibiting both insect production and spawning success. In the last four years we've restored 27 miles of those roads to a natural state to improve conditions in sensitive bull trout streams, and we've started work to restore up to 10 more miles by the end of 2020. Decommissioning roads also means removing problematic and undersized culverts, which is opening up dozens of miles of critically important headwaters habitat. *(Underway.)*



That's not gold in the creek: it's an overload of sediment in a bull trout spawning stream. Removing old, erosive roads will help stop sediment at the source.

POOR WATER QUALITY

It's simple: fish need clean water. And when water is your universe 24/7/365, its quality can mean life or death. Among the challenges in the Clark Fork basin are contamination from heavy metals and toxic chemicals, high nutrient levels that cause oxygen-depleting algae blooms, and pollution and runoff from farms and city streets.

— What we're doing: —

Superfund Cleanup

Upper Clark Fork (UCF) Superfund mine waste cleanup began in 2013, but an enormous volume of contaminated sediment remains in the floodplain leaching heavy metals into the river. Unsurprisingly, that sediment is rich in copper, a metal particularly harmful to fish. We're working closely with agencies, stakeholders, and researchers to document and study pre- and post-cleanup conditions, track fish response to cleanup, provide technical input on cleanup designs, and ensure this epic restoration effort is effective, enduring, and ecologically sound. *(Ongoing; research projects begin summer 2019.)*

Smurfit Cleanup

Just downstream of Missoula, buried toxic waste at the former Smurfit-Stone pulp and paper mill site continues to pollute groundwater and the river with hazardous chemicals and heavy metals. PCBs, dioxins, arsenic – this site has it all, and not surprisingly, those contaminants have made their way through the food chain and into the fish. Despite more than a decade of citizen demand, cleanup progress at the site could be charitably described as plodding. We're pushing harder than ever with a mix of technical, legal, and advocacy strategies to get those dumps cleaned up, and to get the witch's brew of wastes out the floodplain and away from the river. *(Ongoing.)*

Water Quality Research

Rivers are complex systems – as are the impairments that affect them. Heavy metals, excessive nutrients, low flows, and high water temperatures each degrade water quality, but together they have compounded and overlapping impacts. To ensure we apply the right remedies, we need to understand those interactions. We're working with an interdisciplinary team of researchers on a five-year study of the various factors limiting water quality in the UCF so that we can better understand how their combined impacts affect fish, aquatic habitat, and riparian areas. *(Underway.)*

Superfund cleanup of contaminated floodplain soils will keep toxic mine waste laced with copper, arsenic, lead, zinc, and cadmium, from leaching into the Upper Clark Fork River.



Design by Kerry Morse



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