

A Little Goes a Long Way

FWP, landowners, and private conservation groups are working to keep just a bit more water in spawning tributaries—the natural “hatcheries” of Montana’s storied trout rivers.

By Tom Dickson



PHOTO ILLUSTRATION BY LIKE DURAN / MONTANA OUTDOORS

For years, Alan Carroll and his wife inadvertently irrigated their apple orchard and hay field with tens of thousands of baby rainbow trout.

The couple pumped water from an irrigation ditch that ran along the hill above their cabin near the Jefferson River, a few miles north of Twin Bridges. The ditch drew water from Hells Canyon Creek, a small tributary of the Jefferson River. The Carrolls had no idea that tiny trout fry were part of the mix.

Then in the mid-1990s, Montana Fish, Wildlife & Parks biologists met with the couple to explain that, each April, rainbow trout moved up Hells Canyon Creek from the river to spawn. When the eggs hatched into trout fry, more than one-third of the little fish were drawn into the irrigation ditch and spewed onto the couple’s alfalfa fields and orchard. “That didn’t seem right to us,” Alan Carroll, a carpenter, says.

There was another problem: Most of the water drawn from the creek did not reach their crops. “We diverted three cfs [cubic feet per second] but were lucky if we got even one,” Carroll says. Like other earthen irrigation ditches across Montana, theirs leaked. Precious water soaked into the arid sagebrush-studded hillside where the ditch had been dug decades earlier. Because this forced the Carrolls to pull more water to get what they needed, they typically drained lower Hells Canyon Creek by late summer.

That was another blow for baby trout, says Ron Spoon, an FWP fisheries biologist in Townsend who has devoted much of his career to restoring the Jefferson trout population. “Not only were they being entrained in the ditch, but the ones that remained in the creek were stranded and couldn’t make their way down to the Jefferson,” he says. Trapped in shallow pools, the young trout became easy prey for kingfishers and other birds.

Hells Canyon is one of only three spawning tributaries on 40 miles of what was once one of Montana’s premier trout rivers. As Hells Canyon went, so went the Jefferson’s rainbow population.

To solve the creek’s chronic dewatering dilemma, FWP, Carroll, and two other water rights holders signed a lease agreement in 1996. State and federal agencies paid to replace the ditch with a \$200,000 gravity-fed

pipeline. They also installed a fine mesh self-cleaning screen that allows water into the pipe but keeps young trout out. Carroll used some of the water saved by the new system to irrigate his land more efficiently. He and the other landowners leased the rest of the water to FWP, which kept it in the creek to benefit trout. “It was totally win-win,” Carroll says.

The Hells Canyon Creek lease, recently renewed until 2029, is a good deal for all parties. But consider this: Of the more than 300 other chronically dewatered streams across Montana that FWP has identified, the agency has secured only a handful of water rights leases like the one on Hells Canyon. If leasing can help improve trout reproduction

on vital spawning tributaries, why isn’t the agency doing more of it elsewhere?

NATURE’S “HATCHERY TRUCKS”

Montana trout rivers are the superstars of fishing videos and tourism brochures. But with some exceptions—a few rivers below dams with ample main stem spawning habitat—it’s not the rivers but their tributary streams that produce most of the trout that end up in those renowned waters.

Each year, trout swim up tributaries to lay their eggs: rainbows in late spring, cutthroats in midsummer, and bull and brown trout in the fall. They use their fins to create dish-shaped spawning pads, known as redds, in



DRAINED Above left: Tiny Hells Canyon Creek, shown here in early spring, is a major spawning tributary for the Jefferson River (below). Above right: Ron Spoon, FWP fisheries biologist, says chronic dewatering in late summer prevented the creek from producing rainbow trout.



CLOCKWISE FROM TOP: LEFT, DARYL DRAKE; TOM DICKSON/MONTANA OUTDOORS; JOHN LAMBING



which eggs are oxygenated by water flowing over bottom gravel. After hatching, baby trout (“fry”) need a certain amount of water in the stream to survive the next several months. Once they reach about three inches long, the young trout require enough water to swim downstream to the main river, where in a few years they grow to catchable size.

“When Montana switched to wild trout management and stopped stocking rivers in the 1970s, tributaries became our ‘hatchery trucks,’” says Spoon. Fed by mountain runoff and springs, tributaries also cool rivers in late summer and provide temporary refuges for adult fish.

What’s more, creeks do all this with a surprisingly small amount of water.

TROUT DON’T READ

As she’s driving us south along U.S. Highway 89 in the upper Paradise Valley, Carol Endicott promises to show me the Yellowstone River’s most productive Yellowstone cutthroat trout spawning tributary. Envisioning a major stream, I’m surprised when the FWP fisheries biologist crosses a small creek near Tom Miner Basin and hits the brakes. “Whoa! I always drive past it,” she says.

No wonder. The rivulet is hardly visible from the highway. On this May day, spring runoff has swelled it to about 15 cfs. But in

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August, when the cutthroat eggs are hatching, the creek flows at just 2 to 3 cfs and is no wider than a neighborhood sidewalk. By comparison, in August the nearby Yellowstone roars past at 3,000 cfs, as wide as a six-lane freeway.

FWP studies show that most of the Yellowstone’s cutthroat trout spawn in this and a half-dozen other tributaries. Collec-

Tom Dickson is editor of Montana Outdoors.



NATURE’S HATCHERIES Counterclockwise from top: A rainbow trout clears debris from gravel in a spawning tributary before laying its eggs. Creeks like these are where most trout are produced. Baby trout live in tributaries for several months, requiring steady flows to protect them from predators and allow for outmigration downstream to rivers. FWP Yellowstone cutthroat trout biologist Carol Endicott at a critical spawning tributary flowing into the Yellowstone River.



tively, it’s not a lot of water, maybe 50 cfs total, and mainly in short stretches. This particular creek’s most productive spawning habitat runs from the highway upstream for just a quarter mile.

Endicott points to small gaps between basketball-size boulders. Each summer, while cars and pickups whiz past, cutthroat move up from the river to lay their eggs in gravel patches that Endicott describes as “the size of teacup saucers.”

“It’s certainly not textbook spawning habitat,” she says. “I guess these trout didn’t read the textbook.”

MONTANA RECOGNIZES FLOWS

Trout don’t require much water as spawning and rearing habitat, but they definitely need some, especially at critical times of the year.

Each summer, hundreds of streams across Montana, many of them trout spawning tributaries, drop dangerously low. Among the causes: inadequate snowpack, natural leakage into gravel substrate, and diversions for mining and town and city water supplies.

But the biggest water draw comes from crop irrigation. Essential for supporting Montana’s agricultural and livestock economy, the timing of most irrigation withdrawals couldn’t be worse for young trout. What Spoon calls the “six-week problem”

occurs from late July through mid-September. “That’s when tributaries need a certain amount of water to keep those baby fish alive, so they don’t get stranded and become bird food,” he says.

Biologists and trout anglers aren’t the only ones concerned about tributaries left high and dry. Many landowners want their property to provide healthy fish habitat. Yet for decades, they couldn’t leave water in tributaries because Montana law required that rights holders put it to a “beneficial” use—which included only “diversionary” purposes such as irrigation. Otherwise they risked losing their water rights (see “How Montana water law affects spawning tributaries,” page 19).

Montana began viewing rivers in a new light in 1969. That’s when the legislature passed the “Murphy Rights” bill—named after the bill’s author—formally recognizing that flows were necessary for fish habitat. The bill also authorized what was then the Fish and Game Department to file water rights claims for instream flows on several of the state’s top trout rivers.

In 1973, the Montana Water Use Act firmly established flows as a beneficial use of a stream. Finally, it was legally permissible to protect water flowing in a creek.

Unfortunately, it wasn’t economically



feasible for many landowners. So in 1989, Montana lawmakers began allowing FWP to pay willing landowners to lease all or some of their water rights, for up to 10 years at a time, to restore or maintain “instream flows” (water in a stream channel). In 1995, Montana passed another bill allowing non-governmental organizations (NGOs) such as Trout Unlimited to do the same. “With instream flow leases, the landowner is just temporarily leasing the right to FWP or an NGO like us to provide flows in a creek,” says Stan Bradshaw, an attorney for Trout

Unlimited’s Montana Water Project and former head of FWP’s legal team.

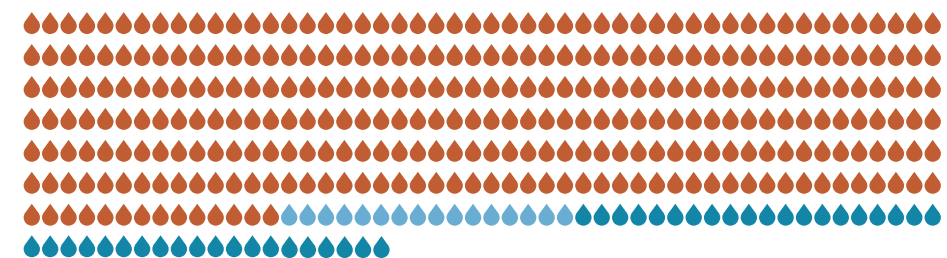
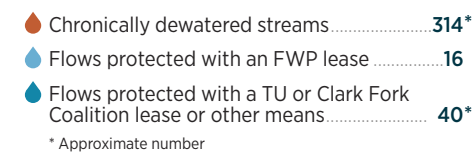
FWP holds 16 instream flow leases (four of which are pending final approval by the Montana Department of Natural Resources and Conservation, or DNRC), TU has more than 20, and the Clark Fork Coalition holds another dozen or so. “It’s all about maintaining connectivity,” says Andy Brummond, one of three FWP water conservation specialists. “We want to maintain a water link from the upper reaches where the fish spawn to the mouth, with no dry spots in between.”



CLOCKWISE FROM TOP: LEFT, JEFF VAN TINE; TOM DICKSON/MONTANA OUTDOORS; ROBB ROBERTS; SHUTTERSTOCK

314 chronically dewatered streams in Montana

For more than a century, hundreds of Montana streams and rivers run dry in late summer. Until relatively recently, a dry creek meant that water was being put to a “beneficial use” such as irrigating hay fields. But in recent years, more landowners have wanted to keep water in their streams to benefit fish and wildlife. One option is an instream flow lease agreement with FWP or a nonprofit conservation group. Yet even though these legal agreements have been around since the 1990s, only 15 percent of chronically dewatered streams are protected this way.





leaky headgates, for example. Some or all of the saved water stays in the stream to help trout. “Many irrigation supply systems in Montana are old and inefficient,” says Spoon, the Jefferson River biologist. “People did the best they could back then, but now, with water in such scarce supply, systems need efficiency upgrades.”

To ensure trout can take advantage of the lease-protected water, conservation partners also remove instream barriers blocking fish passage; install fish screens; plant bank-side willows, alders, and other shade-producing shrubs; and pay for stock tanks so cattle can drink without damaging stream banks. “Water is essential, but it’s not enough just on its own,” says Endicott, the Yellowstone westslope cutthroat biologist. “Only when partners come together to restore and protect habitat can tributaries function for trout like they need to.”

WHY SO FEW?

In the mid-1990s, FWP biologists compiled a list of 140 “chronically dewatered streams” across Montana. In 2005, the department increased the list to 314 streams. A current

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revision adds even more. “Pressure on streams is increasing from things like new wells for more subdivisions to farmers increasing their irrigated acreage,” says Stephen Begley, an FWP water conservation specialist working on the list.

Instream flow leases aren’t the only way to maintain water in chronically dewatered streams. Landowners can ask DNRC for a “change in use” that allows them to maintain some or all of their water rights as instream flow. Other tools include voluntary drought response plans and agreements with the U.S. Fish & Wildlife Service to protect potentially threatened species such as Arctic grayling.

But usually the most feasible way for landowners to retain a bit more water for fish is with an instream flow lease.

Unfortunately, the legal agreements protect water in only 15 percent of the chronically dewatered streams that dry up most summers. “One reason we don’t see more leases is this belief that if you’re not using water for consumptive purposes such as irrigation, you risk losing your water right—even though that hasn’t been true for half a century,” Bradshaw, the TU attorney, says. Another is the complicated process, including public review, that DNRC must conduct before okaying any “change in use,” also required for instream flow leases. “DNRC’s role is to protect all water users and make sure no one is harmed by a proposed change,” says Brummond, who worked for the agency before moving to FWP. “It can end up taking a long time, which can be frustrating for FWP and groups like TU, but it’s a necessary part of the process.”

State agencies and conservation groups also lack capacity to take on many more lease projects. “Trout Unlimited is going full tilt, with four people in Montana alone

working on leases,” says Bradshaw. FWP employs three specialists who, with help from department attorneys, work on instream flow leases and other water issues.

“A FIXABLE PROBLEM”

Standing near the bank of the Jefferson River one recent spring morning, Spoon acknowledges the hurdles preventing more instream flow leases on trout spawning tributaries. “We’re dealing with old water systems and complex water law,” he says. Even so, he believes that many more dewatered streams can be saved. “It’s a fixable problem. We’ve got a strong track record with leases that don’t create problems for landowners, and there’s plenty of opportunity to do more,” he says.

Spoon has seen firsthand how the legal agreements can improve trout populations. “Back in the 1970s and early ’80s, the Jeff was healthier, with more trout and even a few grayling,” he says. Then, over the next quarter century, drought, climate change, and dewatering took their toll. Thanks to the water lease at Hells Canyon and the restoration of two other spawning tributaries, helped by the



PAYOFF The value of saving water in spawning tributaries is greater trout production in rivers, leading to increased fishing recreation.

Jefferson River Watershed Council, TU, and conservation-minded landowners, the river is making a comeback. Trout numbers more than quadrupled from a low of 288 per mile in 2004 to 1,200 in 2014. The population has since declined for unknown reasons but still

remains higher than two decades ago.

This past spring, FWP biologists counted several hundred spawning rainbows in Hells Canyon Creek alone. “All the baby trout those fish produced?” Spoon says. “They’re the Jefferson’s future.” 🐟

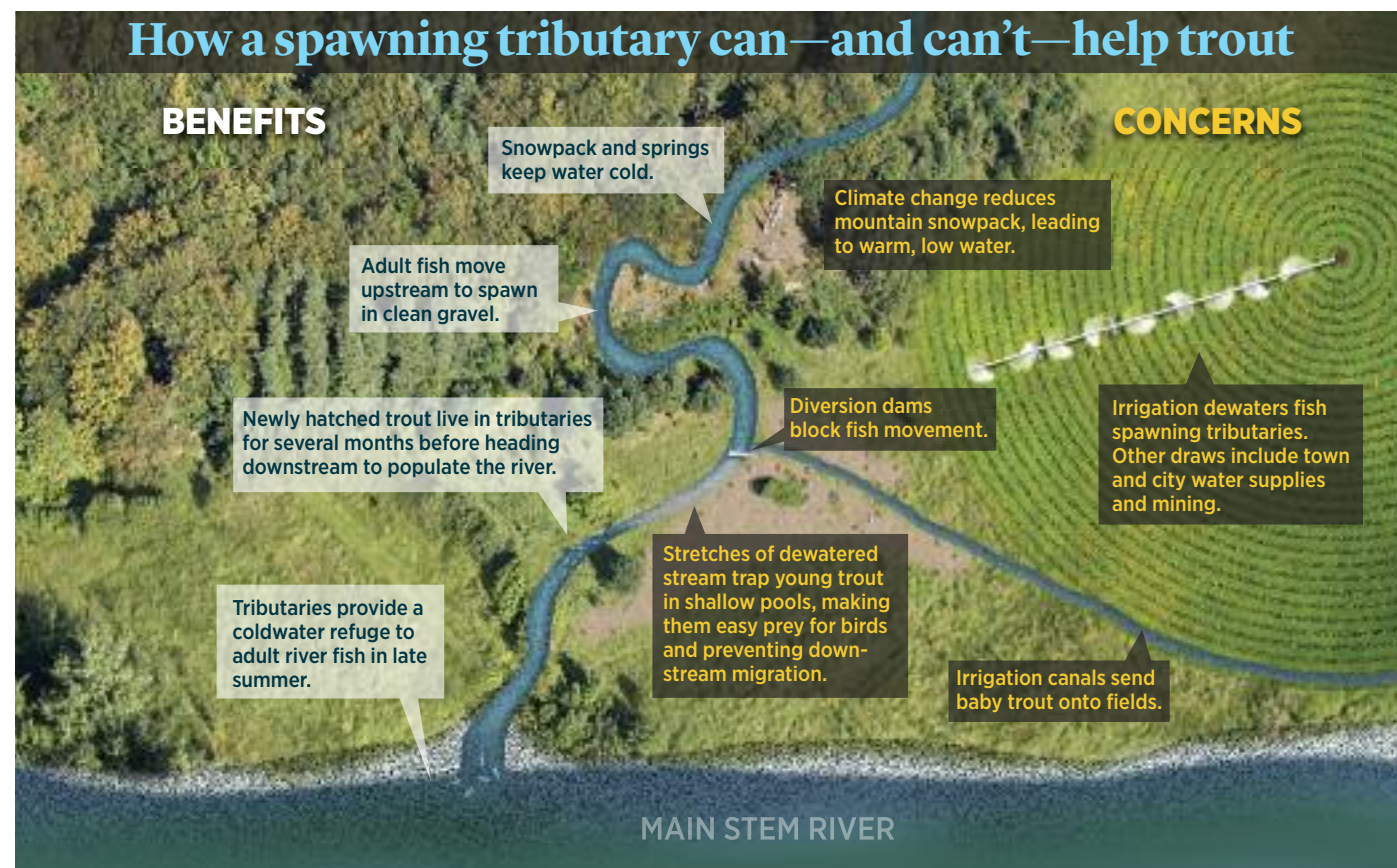


PHOTO ILLUSTRATION BY LUKE DURAN/MONTANA OUTDOORS

TOP TO BOTTOM: JASON SAVAGE; BILLINGS PUBLIC LIBRARY

How Montana water law affects spawning tributaries

Starting as far back as the late 1800s, demand for water by farmers, ranchers, miners, municipalities, and others began outstripping supply. Most western states responded by adopting a legal framework called the Prior Appropriation Doctrine, commonly summarized as “first in time, first in right.” This means that water users with the oldest claims have the first (senior) priority for water.

“Let’s say you have two ranchers along a stream. The one down by the mouth has an 1890 water right and the one farther upstream has a 1910 water right,” says Stan Bradshaw, an attorney for Trout Unlimited’s Montana Water Project. “If, during a summer when water levels are low, the rancher with the senior water right is not getting enough water, he can insist that the upstream rancher stop irrigating.”

Another element of prior appropriation is known as “use it or lose it.” This means water rights holders must put water to a “beneficial use” or risk losing their rights altogether. This was originally meant to prevent senior water rights holders from allowing their water to “uselessly”—the thinking at the time—flow off to the ocean while neighbors with junior rights who needed the water stood helplessly by.

For decades, Montana law only recognized “consumptive” uses, such as irrigation, as a beneficial water use. Not until 1973 did the state recognize the “non-consumptive” use of instream flow for trout habitat. “That was huge,” says Brummond. “That started the ball rolling.”

To change the purpose of all or some water in a right, say from irrigation to instream flow, a rights holder must apply for and be granted a “change in use” authorization by the Department of Natural Resources and Conservation (DNRC). The agency okays the change only if it determines that other water users won’t be harmed. “Rarely would a change to instream flow harm someone else, but it’s DNRC’s responsibility to verify that with all parties before approving a lease proposal,” says Brummond, who previously worked for that agency. “And when you’ve got multiple rights holders on a stream, which is often the case, that verification process can take a long time.” ■



The Billings Land & Irrigation Company building an irrigation canal in 1895. Irrigation has long been essential to Montana’s cattle and farming industries. New laws help trout receive some of that water without hampering irrigation operations.