

# INTACT

How a 10-year FWP project protects one of the nation's largest populations of pure-strain westslope cutthroat trout. **By Becky Lomax**

**W**hen Kalispell angler Tony Anderson hiked into the Jewel Basin Area with Montana Fish, Wildlife & Parks biologists to check on Blackfoot Lake in 2009, he expected the worst. "I figured it was a dead bowl of water," he says. FWP had treated the lake two years earlier with a fish toxicant, removing the existing non-native fish, and stocked it with pure-strain westslope cutthroat trout. Anderson and many others had denounced the ambitious plan to reestablish westslope cutthroat populations in 21 remote, high mountain lakes. They feared the project would poison the environment and waste anglers' license dollars.

But at Blackfoot Lake, Anderson watched a fisheries technician lift a fine-mesh net wriggling with aquatic insects. He saw frogs swimming in the shallows. Once he began to fish, on his second cast he hooked and landed a 17.5-inch pure-strain westslope. "It was so beautiful, and so fat from all the food in the water," Anderson says. "I sat down on the shoreline, actually shaking with excitement. They were right. The project was a huge success."

Now that the 10-year South Fork Flathead Westslope Cutthroat Trout Conserva-

tion Program is complete, Anderson and others acknowledge that the controversial project has protected the river's nationally renowned pure-strain westslope cutthroat trout fishery. A joint project of FWP, the U.S. Forest Service (USFS), and the Bonneville Power Administration, it has also created strongholds of Montana's state fish in 21 lakes—sources of trout that could be used for future restoration efforts. What's more, the project neither created ecological havoc nor drained the FWP fisheries budget.

These achievements required overcoming tremendous obstacles. The largest westslope cutthroat trout restoration in history, the project spanned a 1,681-square-mile watershed. Much of it took place in wilderness that called for new ways of transporting fish and equipment. It required eliminating existing non-native trout populations at a scale never done before. And it meant converting a fish farm into a "genetic conservation facility" for



PATRICK CLAYTON/ENGRETSO/UNDERWATER PHOTOGRAPHY

**BELOW-WATER BEAUTY** A pure-strain westslope cutthroat trout swims in the South Fork of the Flathead River. The population is one of largest and best protected in the United States.

rearing pure-strain westslope cutthroat. “It was a massive and sometimes frustrating undertaking,” says Matt Boyer, FWP’s lead field biologist for much of the project. “But it was definitely worth it to achieve long-term native fish conservation on such a landscape scale.”

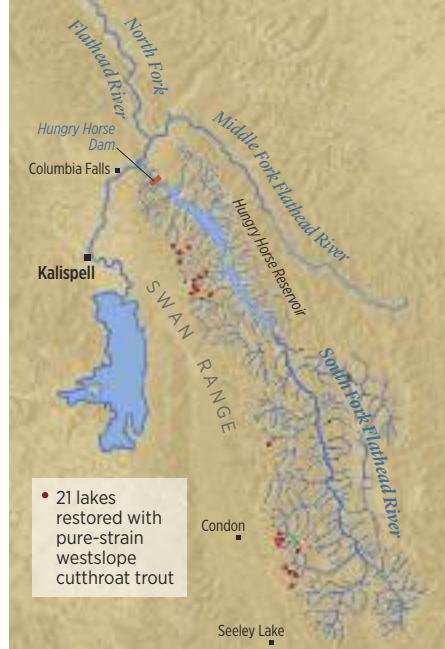
### ONLY 10 PERCENT REMAINING

For thousands of years, the westslope cutthroat trout swam in waters throughout the northwestern United States and western Canada. During the 20th century, its range and numbers substantially declined. Indiscriminate logging removed forest canopy that kept streams cool, while logged hillsides bled silt into streams, smothering trout eggs and aquatic insects. Just as harmful were rainbow, brook, and brown trout introduced decades earlier by state and federal agencies.

The non-native fish outcompeted young westslope cutthroat for limited food. The rainbows also interbred with the closely related westslope, creating a “cutt-bow” hybrid whose swelling populations threatened to extinguish the shrinking number of pure-strain natives. Two centuries after Lewis and Clark had scientifically described the species in their journals, the range of genetically pure westslope cutthroat populations had decreased by 90 percent.

Genetic purity is vital for a native population’s long-term health. “These fish have

*Whitefish-based writer Becky Lomax is a longtime contributor to Montana Outdoors.*



**PRISTINE PLACE** The South Fork of the Flathead runs north from the heart of the Bob Marshall Wilderness. From 2004 to 2014, FWP removed non-native trout from 21 lakes that were “leaking” fish into the river downstream and replaced them with pure-strain westslope cutthroat.

adapted over thousands of years in a wide range of environmental conditions,” Boyer says. He explains that trout that have survived ice ages, droughts, floods, forest fires, and other natural extremes possess genes that will help future generations endure similar onslaughts.

The South Fork has some of the largest intact habitat for genetically pure westslope cutthroat trout in the United States. Its headwaters are Youngs and Danaher Creeks in the middle of the Bob Marshall Wilderness, about 50 miles northeast of Missoula as the crow flies. The river flows north along the east flank

of the Swan Range and eventually meets two other forks near Columbia Falls. The three forks form the Flathead River, which proceeds south into Flathead Lake.

The South Fork’s westslope cutthroat population is healthy and intact for two main reasons. The mountain lakes and streams that feed it all summer long are cold and clean. And the native trout population is protected by Hungry Horse Dam, completed in 1953, from invasion by rainbow trout and other non-native species downstream.

Yet one threat has long worried trout conservationists. Decades earlier, 21 of the 335 lakes in the watershed were stocked with Yellowstone cutthroat trout and rainbow trout. (Yellowstone cutthroat are native only to the Yellowstone River drainage.) Though FWP has since stocked only genetically pure westslope cutthroat trout in the lakes, those fish bred with the Yellowstone cuts and rainbows to create hybrids. Some of the lakes, on the east side of the Swan Range, “leaked” hybrids from their outlets into streams that flow downstream into the South Fork, threatening the river population’s genetic purity. “We were losing the pure-strain westslopes awfully fast, and once they’re gone, they’re gone for good,” says Brian Marotz, former manager of the westslope conservation program.

### ANGRY LETTERS

Like all large-scale fisheries conservation projects, this one began with large-scale

paperwork. FWP, Bonneville Power, and the USFS, which manages wilderness and national forest lands in the watershed, prepared a draft Environmental Impact Statement for public review in 2004. The proposal called for removing all existing fish using the toxicant rotenone and replacing them with pure-strain westslope cutthroat.

Critics decried the massive expense required to restore fisheries on such a large scale in such remote areas. Even louder objections came over the use of rotenone. “Poisoning a stream should be a hangin’ offense,” one angry Kalispell resident told Marotz. Letters in the *Daily Inter Lake* denounced FWP for using a chemical the authors feared would kill other wildlife, linger in the food chain, and pollute downstream drinking water supplies.

FWP answered the concerns. “We hosted public meetings and met one-on-one with our most vocal critics to clear up misconceptions,” says Marotz. He and Boyer explained that no additional angling license dollars would go to the project. Bonneville Power would foot the bill with funds already earmarked as mitigation for Hungry Horse Dam’s construction and operation.

As for the rotenone, Marotz and Boyer explained that the chemicals in the plant-derived toxin are harmless to humans at levels used in the projects. They break down rapidly and kill only gill-breathing organisms (by preventing oxygen from crossing gill filaments). Because these include all fish



**NO WAY PAST** Though dams generally don’t help native fish species, Hungry Horse Dam actually protects the population upstream from hybridization with non-native rainbows downstream.

as well as amphibians and the nymphal stage of mayflies and caddis flies, “we used potassium permanganate to neutralize the toxin downstream of lake outlets so that gill-breathing creatures there weren’t harmed,” Marotz says.

Scientists have shown that insect populations rebound rapidly after rotenone application. FWP biologists documented all lake life before each treatment to confirm that every invertebrate species returned afterward. “If that weren’t the case, it would be entirely counterproductive to use rotenone as a restoration tool, since we’d be harming the food source for the very fish we’re working to conserve,” says Boyer.

After Anderson’s visit to Blackfoot Lake, one of the first treated with rotenone then restocked with pure-strain westslope cutthroat, the Kalispell angler became a project ambassador. “I’d seen it firsthand and was sold,” he says. “I told people that I understood their fears, but I’d seen with my own eyes that the aquatic life in those lakes, including the trout, were doing fine.”

### MAKING A SPECIALIZED HATCHERY

Before non-native trout could be removed from each of the 21 lakes, FWP needed pure-strain westslope cutthroat to replace them. With Bonneville Power funding, FWP leased a rainbow trout farm at Sekokini Springs on USFS land near West Glacier. After the owner removed his 60,000 rainbows, biologists converted the spring-fed hatchery into a cutthroat facility.

Instead of rearing young fish for stocking from just any old westslope cutthroat, Boyer and his team collected genetically pure westslope cutthroat from streams near each of the targeted lakes. “These locally adapted genes maximize the potential for an individual fish to survive and reproduce,” he says. Horses carried the fish out in coolers lined with trash compactor bags and filled with ice. Over several years of fish collection, more than 90 percent of the fish survived the journey.

At the hatchery, FWP hatchery manager Scott Relyea and fisheries technicians manually spawned the trout. After extracting the



**TAKING OUT THE WRONG FISH** From left to right: A helicopter transports boats and supplies to Margaret Lake; unpacking barrels of rotenone used to kill an existing population of non-native fish; launching boats to carry rotenone onto Lena Lake for dispersal.



**BRINGING IN THE RIGHT FISH** Left: FWP workers load a helicopter bucket from a hatchery truck for stocking a backcountry lake. Above: Fish are transported via pack horses to Lena Lake.



**GENETIC CONSERVATION FACILITY** Scott Relyea, manager of FWP's Sekokini Springs hatchery near West Glacier, checks on genetically pure westslope cutthroat trout fry. Once they reach fingerling size (below), and have been screened for pathogens and verified for genetic purity, the fish are stocked in 21 lakes in the South Fork of the Flathead watershed.



white, milky milt from males, they checked it under a microscope to confirm viable sperm content. Then they squeezed eggs out of ripe females into metal bowls and mixed in the milt. The fertilized eggs were rinsed, placed in coded containers, then incubated for 20 days to produce fry (half-inch-long baby trout).

Unique among Montana's hatcheries, Sekokini Springs quarantines fish for pathogen screening and genetic purity verification. Once a westslope cutthroat population passes the tests, it is "certified" to be used for the South Fork project.

Converting each of the lakes took several years. Crews applied rotenone in the fall. That helped protect amphibians, which move from water or burrow deep in mud when temperatures drop. After ice-out in early summer, crews returned to ensure the treatment was effective and the lake was fishless. In mid-summer, they refilled the lake with hatchery-spawned fish.

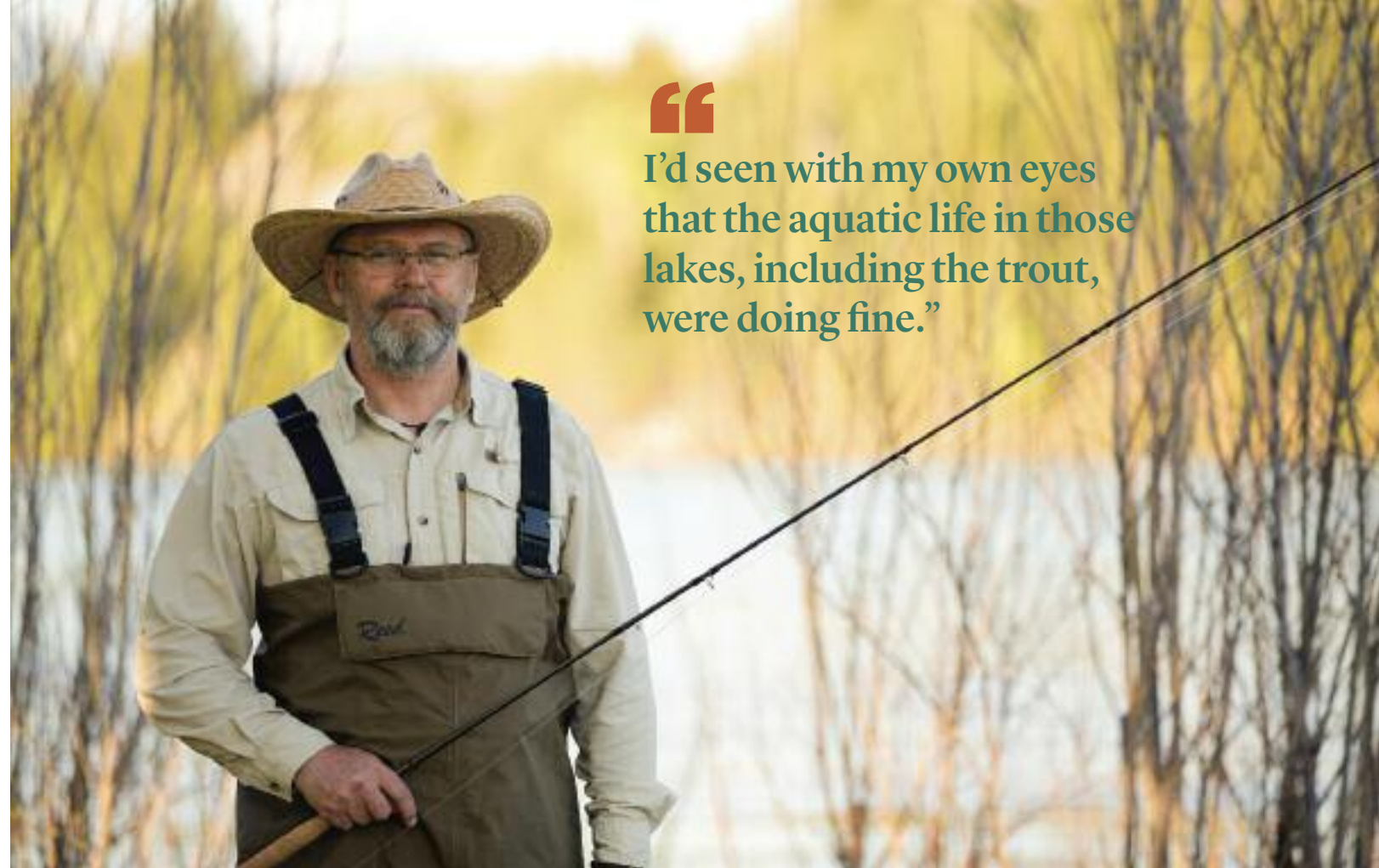
Delivering rotenone, boats, nets, hatchery trout, and other items to remote lakes required a range of transportation methods. Crews backpacked inflatable rafts, nets, and other gear to all the lakes except one that could be reached by road. On most lakes, helicopters delivered 30-gallon drums of fish toxicant. In two large lakes, single-engine aircraft tankers administered the rotenone to speed up the process and reduce site disturbance. Horses and helicopters delivered fish for restocking.

Fifteen lakes were treated with rotenone. The other six were managed with "genetic swamping"—adding large numbers of pure westslope over several years to dilute non-native genes.

For a few more years, Relyea and his team will continue to produce new year-classes of pure-strain westslope cutthroat for stocking until populations become self-sustaining through natural reproduction in streams feeding into the lakes.

**COLD AND PURE**

With their vibrant red chin slashes and orange-hued undersides, the genetically pure westslope cutthroat now swimming in the 21 lakes signal the project's success. "Aside from the footprint of Hungry Horse Reservoir, the South Fork's habitat is largely intact with no



**“**I'd seen with my own eyes that the aquatic life in those lakes, including the trout, were doing fine.”

immediate threats from human interaction, invasive species, or habitat modification," says Sam Bourret, lead FWP biologist during the project's final two years. "The primary threat now is climate change, but because these lakes are at high elevations, the cold water they contain provides some buffer against warming temperatures."

As strongholds of genetically pure trout, the lakes are attracting anglers and others. "Many hikers and backpackers enjoy knowing there are native fish in wild places like the South Fork, and that those environments are functioning naturally as they have for thousands of years," says Mark Deleray, FWP regional supervisor in Bozeman (and regional fisheries manager in Kalispell during much of the restoration work).

The restored lakes still leak some trout from their outlets into the South Fork of the Flathead, miles downstream, but now those fish are pure-strain cutts. The river continues to draw anglers and rafters with its aquamarine waters, wilderness setting, and native salmonids. Says Boyer, "Anglers can find opportunities to fish for rainbow trout pretty much anywhere in the world, but



**CHANGE OF HEART** Kalispell angler Tony Anderson was skeptical about FWP's project to replace non-native trout in the South Fork of the Flathead watershed with pure-strain westslope cutthroat. "I had to see it for myself," he says. "Once I did, I was completely on board."

there are very few places left where you can catch pure-strain westslope cutthroat. To many people, those fish are a large part of what makes the South Fork such a remarkable place."

As for Anderson, he says he feels proud to have assisted in moving the project for-

ward by helping fellow anglers overcome the same skepticism he'd once had. "I told people that, just like the bald eagle is our national bird, the westslope cutthroat trout is our state fish," he says. "It would be a disgrace if we didn't do everything in our power to preserve it." 🐾

CLOCKWISE FROM TOP LEFT: PAUL OUENEAU; JEREMIE HOLLIMAN; JEFFERICKSON; TODD PEARSONS; VENGRETSO; UNDERWATER PHOTOGRAPHY