

Fish Story

Native trout are returning to America's rivers and streams, thanks to new thinking by scientists and conservationists

By Robert M. Poole

The immigrants, crowded into the damp hold of the German steamship Werra, were not particularly welcome when they made landfall in the United States on February 24, 1883. Xenophobic feelings were running high, with many Americans worried that the Europeans would displace residents already struggling to stay afloat.

The critics were quite nasty about the newcomers, variously described as scaly, voracious, monstrous and homely. They stole food from natives. They had sharp teeth. They ate their young. They were greenish yellow with red spots. They were fish.

Specifically, the fish disembarking the Werra that February were trout-to-be in the form of **80,000** fertilized eggs from a hard-fighting strain of *Salmo trutta*, the European brown trout, which makes its first appearance in Roman literature about **a.d. 200**, swims through Izaak Walton's *Compleat Angler* and Shakespeare's *Twelfth Night*, inspires Franz Schubert's "Trout" quintet of 1819 and establishes a beachhead in North America with this 1883 shipment.

The consequences of its arrival are felt—on the riverbank, in public hearing rooms and in courthouses—to this day. Indeed, it is not too much of a stretch to suggest that the continuing story of trout in **America**—native and introduced, threatened and thriving—is a fair reflection of our own restless history, with its marathon migrations, its paroxysms of prejudice, its well-intentioned blunders and its reassuring urge to set those blunders right again. Before we get into that, let us return to the invasive species that launched this fish story.

It began, suitably, with a fishing trip. Fred **Mather**, a United States delegate to the Berlin Fish Cultural Exposition of 1880, visited the Black Forest, where he was delighted to catch a few brown trout with his host, the Baron Friedrich Felix von Behr, president of the German Fish Culturists Association. **Mather**, a founding father of fish propagation in the New World, was determined to import brown trout to America.

The baron obliged him a few years later, providing the first eggs for shipment, which were stowed in the Werra's icehouse. When the fish arrived, **Mather** took them to a fish nursery at Long Island's Cold Spring Harbor. Some were allowed to develop into fry, others were dispatched to hatcheries in Caledonia, New York, and still others to the U.S. Fish Commission station in **Northville**, Michigan. They and their progeny, reinforced with shipments from Germany, England and Scotland, would be released into the rivers of their adoptive homeland and soon were thriving in streams from New England to the Rockies. They spawned; they grew fat; they ate their young; and, yes, they did exactly as the xenophobes predicted—they muscled aside the native brook trout of the East, beloved of **Winslow** Homer and Daniel Webster. Brown trout grew bigger than brookies, could withstand warmer water and were fiercely territorial, sending their homegrown cousins scooting upstream in search of new quarters.

Not that there were many brook trout left to harass by the 1880s. This was thanks not to *Salmo trutta* but to *Homo sapiens*. As cities and towns spread in the years following the Civil War, forests were felled for timber, rivers made into logging runs, towering hemlocks axed for tanneries and hardwoods ground up for distilling in acid factories. Brook trout, scientifically known as *Salvelinus fontinalis*—the "little salmon of the fountain"—had lost their fountains, the clear, cool, richly oxygenated waters they need to **survive**. By **1879**, *Forest and Stream* magazine reported little hope: "This is probably the last generation of trout fishers."

The requiem proved premature. Before the **20th** century ran its course, brown trout had taken control of the Beaverkill River of New York, the Letort of Pennsylvania, the Pere Marquette of Michigan, the Madison of Montana and other waters soon to become legendary in the chronicles of American angling. "Many of us can remember how poor our sport was before the first of the brown trout came in," wrote Theodore Gordon, a pioneer of American fly-fishing, in **1913**. In the years since, fishermen and fisherwomen have flourished with the brown trout. At last count, there were 34 million anglers flailing away with fly rods and spinning gear in the United States, where they spend \$36 billion on their sport each year.

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Today, although marginalized and reduced in number, the beleaguered brook trout hangs on in the East. The fish find refuge in the high, thin tributaries of the Catskills; in the secluded ponds of Maine and Michigan; and in the little rivers of the Blue Ridge and the Alleghenies. Thousands were scooped up and saved for hatcheries in the 19th century; these helped replenish Eastern streams and provided stock in places where brook trout had never lived before—where today they are cast, ironically, in the role of invaders, driving the natives before them.

Whether a trout is a nuisance or a valued member of the community depends upon where you stand on the map. Of the four major trout species in the United States—rainbow, brook, cutthroat and brown—only the brown trout was introduced from abroad, but any of the four might be considered invasive when introduced into a new watershed. Thus, a rainbow trout (*Oncorhynchus mykiss*) transplanted from its native California to Virginia is regarded as a nonnative in its new home; by the same reasoning, an Eastern brook trout becomes a pest in Western streams. It has displaced resident trout from the small rivers and lakes of Montana, Colorado, New Mexico and other mountain states. The brook trout's main victim is the cutthroat, so called for the bright slash of crimson under its jaw. Squeezed on one side by invasive brook trout, native cutthroats are also under challenge from rainbow trout, a cousin introduced from the Pacific Coast. Cutthroats comprise at least 13 separate subspecies, each one fine-tuned by centuries of evolution for a particular nook or cranny of rugged mountain and desert living. Of these subspecies, two are extinct, two endangered and many others in trouble.

Does it matter?

"Well, it matters if you are concerned about biodiversity," says Robert J. Behnke, an emeritus professor of fisheries and conservation at Colorado State University and one of the country's leading trout biologists. "The first rule of intelligent tinkering is not to throw away a part because you do not understand where it goes or what it does," he adds, paraphrasing the conservationist Aldo Leopold. "You put brook trout in a stream and the cutthroats just disappear," he says. "They're so many brook trout in the West—that's why they're our leading candidate to poison."

Behnke, a blond, burly man who punctuates his conversation with puffs on an ever-present pipe, calmly watches a visitor squirm at the mention of poison. "Look, a lot of chemophobes don't like it, but these poisons have been declared perfectly safe by the Environmental Protection Agency. The federal courts have ruled that it's all right to use them."

Thus thousands of brookies have sacrificed their lives to make room for native fish in Western states. When fast-acting piscicides such as antimycin or rotenone have done their work and dissipated, natives are reintroduced to the stream.

Such poisoning and relocation programs have led, in part, to the recovery of many previously imperiled fish: the Gila trout, native to the mountains of New Mexico and southeast Arizona, recently had its status upgraded from endangered to threatened by the U.S. Fish & Wildlife Service. The once-endangered Paiute cutthroat of California, likewise now listed as threatened, has returned in decent numbers, as have the Lahontan cutthroat of Nevada and the Bonneville cutthroat of the Great Basin.

In the East, meanwhile, biologists at the Great Smoky Mountains National Park have begun poisoning some creeks to rid them of rainbow trout, imported from California in the 1930s and thriving in the Smokies ever since. By removing rainbows from about 40 miles of the park's 2,100-mile river system, the National Park Service hopes to make at least part of the Smokies a refuge for brookies again.

Perhaps the sweetest comeback belongs to the greenback cutthroat trout: declared extinct in 1937, the fish is swimming again in the Colorado Rockies, thanks to some scientific sleuthing by Behnke. "This biologist called and said there was a funny-looking trout in Como Creek, way up in the headwaters," Behnke recalls. "Nobody could figure out what it was." Behnke collected one of the funny-looking fish, combed through the early literature of exploration in the region and called for museum specimens collected by 19th-century expeditions. Comparing these with Como Creek's living fish in 1969, Behnke made a positive identification: the long-missing greenbacks, victims of overfishing and hybridization, were back. They had never really left, of course, just disappeared from view for a few decades. From the tiny group of fish Behnke discovered in Como Creek, some 60 new greenback populations have been transplanted throughout the Rocky Mountain National Park and surrounding national forests, ensuring a secure future for the trout that almost got away. The U.S. Fish & Wildlife Service has removed greenbacks from the endangered list; Colorado has honored them as its state fish; and anglers are even allowed to fish for them on a catch-and-release basis.

Behnke and I made a pilgrimage to the section of the Roosevelt National Forest where he rediscovered the

greenbacks. We stood quietly among the aspens while peering into Como Creek, no more than three feet wide. One fish appeared as a shadow holding its place in the clear cold water, facing upstream. Bronze-sided and boldly spotted, it blended perfectly with the brown, pebbly creek bottom—proof that some environmental disaster stories have happy endings. We spotted more fish as we worked our way downstream, stopping where the tiny creek disappears under a roadway. Behnke strained for a last look, pausing before he spoke: "You'd never think there would be fish here."

After more than a century of piscatorial tinkering, nothing seems to be where it belongs—brookies to the west, rainbows to the east and browns all over. This happened for the best of motives: since the late 1800s, government agencies and private hatcheries have been raising fish and transporting them widely to provide food and sport for a growing nation. This long-accepted practice, thought to be modest, progressive and scientifically based, has only recently been questioned by biologists, conservation groups and game agencies concerned about the long-term health of trout populations.

"Nobody gave much thought to the ecological consequences," says Behnke. "A trout was a trout was a trout. It didn't matter what you put where—that was the old paradigm. But we're seeing more thought to managing for native and wild fish these days, and more reliance on habitat rather than hatcheries."

Behnke is heartened that government agencies and conservation groups such as Trout Unlimited show a new appreciation for the importance of genetic diversity and improved habitat, both of which are emphasized in the National Fish Habitat Action Plan. The plan, announced in March 2006 by the U.S. Fish & Wildlife Service and a partnership of state agencies and conservation organizations, will scientifically identify the leading threats to fish species and offer guidelines for their recovery and conservation, with a focus on protecting streams and rivers for fish. The project is modeled after the largely successful habitat restoration plan launched for waterfowl in the 1980s.

In some Western states and in most national parks, biologists and wildlife managers believe that the future health of trout populations will also be enhanced by less emphasis on hatchery-raised fish and more on habitat improvement. In Montana, which depends on visiting anglers for many of its tourist dollars, the state department of Fish, Wildlife & Parks stopped stocking its rivers and streams with hatchery-raised fish three decades ago. The idea was to preserve the variety of Montana's wild trout, which had been compromised by decades of competition and inbreeding with hatchery fish, which tend to be less hardy and less wary than their wild cousins. Hatchery trout, which still **form** the basis of state programs in much of the heavily populated East, are also expensive to raise and to transport to streams, where they are quickly caught by anglers or dispatched by other predators. Less than 1 percent of such fish survive from one season to the next, according to Behnke. "Everybody thought we were crazy when we stopped stocking hatchery fish," says Tom Palmer, information bureau chief of Montana's innovative fish and wildlife agency. "Now it's all wild. We get bigger and better fish that way. They are more resistant to disease, and they survive longer."

Palmer's comments seemed pertinent on a recent September morning, when the season's first snows salted the mountains and I floated down the Madison River in a drift boat prospecting for big brown trout. "Why don't you throw your line under that bank?" said Brian Grossenbacher, an old friend now working as a fishing guide in Bozeman, Montana. I plunked a fuzzy green fly made of feathers and synthetic yam in that direction. It drifted down through the clear current, and a trout lunged for it. He yanked hard, hooked himself, thrashed through the weeds, splashed across the river's surface and finally came close enough to net. The fish weighed about three pounds, his butter-colored sides sprinkled with vermilion spots. We quickly returned him to the river, where, with a flick of his tail, he melted into the gloom. It was a brown trout. Though not native to Montana, he was as wild as a one-eyed jack, his ancestors having been born, bred and tested in the Madison over many generations. In that time the browns had taken over the province of westslope cutthroat trout, which were surviving in the river system but in smaller numbers than the now-dominant browns and rainbows.

Which fish had the stronger claim? As we slid through the mountains, I posed this question to Grossenbacher: "Should the Madison be poisoned to bring back the natives?"

"Stupid idea!" he barked. "We've got a river full of wild fish here. People come from all over to catch them. There's been enough mucking around already," he said, closing the subject. "Cast there to the right—and don't flub this one."

Within an hour or so, we had floated past the mouth of Cherry Creek, a Madison tributary that flows from media tycoon Ted Turner's Flying D Ranch, recently the focus of a long-running and acrimonious legal dispute. In question was whether the state, in partnership with Turner, could poison portions of the creek to kill nonnative brook trout, rainbows and hybrids and to create a reserve for a genetically pure strain of

westslope cutthroat trout. A federal appeals court had ruled in favor of the restoration, and the poisoning had begun.

"Because the area is large," says Palmer, "it will support a large population of westslope cutthroat trout that will be more likely to survive in a changing environment over the long term." To establish havens for the fish, his department plans ten such conservation areas in the Missouri-Madison River drainage, where cutthroats once inhabited 1,200 miles of the river system; in their genetically pure form, cutthroats occupy just 8 miles of that system today.

For the moment, nobody proposes killing the huge population of nonnative fish that make the Yellowstone and Madison rivers so popular for fishermen. It would be technically impractical—piscicides are not effective on big, brawling rivers—but, more to the point, it would be politically impossible, given the rivers' importance to Montana's economy.

One of the nation's prime destinations for traveling anglers, Montana collects \$422 million from fishermen each year. They might themselves be considered invasive, descending in large groups summer and fall, shuffling through the Bozeman airport with their rod tubes while gasping for oxygen in the thin mountain air.

With part of the money Montana collects from such visitors, and with funds saved from closing most of its hatcheries, the state is emphasizing habitat improvement, so that its rivers will have cleaner water, less erosion, better spawning beds and better cover from streamside vegetation—all of which make them more productive. Repairing a trout stream may involve nothing more elaborate than planting a few willows or cottonwoods to stabilize the banks, or fencing out cattle to keep them from trampling the shoreline and fouling the water. In other cases, where years of poor land use have seriously degraded a trout stream, more extreme fixes are required.

That brought Ty Smith into the field. He sat at the controls of his **320BL** Caterpillar, chewing his way through a pasture near Ovando, Montana. The object of his attention was muddy, silt-laden Hoyt Creek, which looked more like a drainage ditch than a living stream. Smith worked the bucket of his 48,000-pound excavator with surgical precision, carving a sinuous new streambed, sculpting places for new riffles and pools, and closely following directions from a pint-size woman in a red knit hat and rubber boots who carried a clipboard, a black-and-white surveyor's stick and an air of authority.

"We are providing the four C's here," said Ryen Aasheim, the Trout Unlimited biologist assigned to this venture. "Our fish like to see clear, cold, clean and connected waters, which we will have in place at the conclusion of this project." She explained that Hoyt Creek, engineered to the specifications on her chart, will be remade along a **11,000-foot** stretch and linked to Dick Creek, which connects to Monture Creek, which connects with the Big Blackfoot River at the heart of this 1.5 million-acre watershed. In a matter of weeks, cold, clear water would be flowing up from the underlying aquifer to Hoyt Creek, which would spill downstream and knit the tributaries together with the main river. That would provide new habitat for native westslope cutthroats and bull trout, both of which have been struggling.

Like the ranchers and cowboys who settled this part of western Montana, young trout are programmed for traveling. Fish hatched in the tributaries of the Big Blackfoot would migrate to the main stem, establish residence and pioneer new sections of the watershed. It was not necessary to stock feeder streams, just to provide those four C's. If you built it, they would come, right to the spot where Ryen Aasheim now stood ankle deep in **muck**. "If you provide a connection in the system, they always find a way," Aasheim was saying. "Sometimes it takes a while for the trout to come back. The earliest, I think, was four months from the time we finished a project like this one."

To get a preview of its potential, I drove through downtown Ovando (pop. **71**), past Trixi's Antler Saloon & Fine Dining and down Highway 200 to Tom Rue's ranch on Kleinschmidt Creek, a recently rehabilitated Big Blackfoot tributary.

Rue, a big, bluff man with a gray mustache and an enthusiasm for trout, met me on a wooden footbridge spanning his creek. "This place was totally degraded from overgrazing," said Rue, "totally! The water was muddy and sludgy, too warm for fish. It was pretty much dead when I came here in **1994**."

That's when the stream restorers stepped in to narrow and deepen the creek's channel, reducing its surface area to make it cooler. They also lengthened Rue's section of the stream from **6,000** to **10,000** feet by adding twists and turns, and put in new fencing to keep wandering cattle out of the water. Now Kleinschmidt Creek runs as clear and cool as the Montana air, cutting under banks deeply shaded by cottonwoods and native

grasses. Since the project was finished, the creek's maximum temperature has dropped by ten degrees, making it a magnet for fish in search of oxygen-rich water.

"The numbers of fish have gone up dramatically," said Rue. "Asymptotically up," he boomed, sounding more like a theoretical physicist than a rancher. Rue was in particularly good humor because he had landed and released a no-inch cutthroat trout just the day before, a sign that the natives were returning.

"Water's the most valuable thing we have next to oxygen. You've got seven million gallons going under your feet right now," he says, nodding at the footbridge. "That's a lot of water for this little creek."

The creek spoke back, chortling under its bridge before **rushing** off to meet the Big Blackfoot River.

If you have heard of the Big Blackfoot it is probably because of Norman **Maclean**, the Montana writer who launched his classic book, *A River Runs Through It*, with this sentence: "In our family, there was no clear line between religion and fly fishing." That was in 1976, long before Robert **Redford** adapted Maclean's story for the Brad Pitt movie in 1992 and made fly-fishing fashionable overnight. A lot happened between those two dates.

The river, debased by years of logging, unrestricted grazing and mining damage, was almost empty of native trout when Maclean's book appeared. Even stocked trout virtually vanished after 1979, when Montana stopped dumping hatchery fish in the river. With almost nothing to catch, local anglers mourned and complained. But they did little to improve the situation until 1987, when the Sunshine Mining Company spurred them to action with its plans for a new open-pit gold mine near Lincoln, where the river rumbles down from the Continental Divide. Thus was born the Big Blackfoot Chapter of Trout Unlimited, which helped to scuttle the proposed mine and goaded the state to examine the river's failing health. This led, in 1990, to the first restoration efforts, which have continued in the years since, with more than 45 tributaries restored, 48 miles of stream channel reconstructed and access for migratory fish opened to 460 miles in the river system. In the same period, some 2,600 acres of wetlands have been preserved, 2,300 acres of native grasslands put to rights and 93,383 acres of private lands placed in perpetual conservation easements. In addition, the community group Blackfoot Challenge has joined with the Nature Conservancy to purchase **88,000** acres of corporate timberlands and transfer the parcels to a variety of public and private interests. "We're making this whole watershed work in a sustainable way for people, fish and wildlife," says Aasheim. "It has to be a win-win situation for the landowner and the wildlife. Otherwise it doesn't succeed."

Having the whole community involved in restoring the watershed makes for an unlikely collection of ranchers who don't fish and fishermen who don't ranch, in league with timber companies, conservationists, politicians, outfitters, various foundations, and state and federal agencies. Perhaps the most unlikely player in this incongruent cast is Jim Stone, a second-generation rancher and chairman of the Blackfoot Challenge, which represents the disparate interests of those living in the watershed.

"I'm odd," he says. "I don't like fish. I don't even like water!" He lets this statement sink in. "If you'd asked me about trout in 1985, I'd have said who gives a sh-t?" Stone, a compact man with close-cropped hair and a drooping Fu Manchu mustache, has a puckish glint in his eye. "I was one of those stubborn old ranchers who did it the way grandpa did just because that's the way grandpa did. Put those cows out there and don't worry about the fish and wildlife guys. But now I can see—damn!—they know what they're doing. If those fish aren't doing well, the cows won't. You get good water, you get good grass, you get good grass, you get good cows! We've spent generations worrying about how we can put more pounds on our cows. The minute I started to make the water-and-grass connection, well, the light switch just went on."

Stone has not yet traded his boots for Birkenstocks—he has a reputation to consider—but he has been tireless in preaching the benefits of clean water and wild trout to his ranching neighbors, and he just plunked down **\$20,000** for the restoration of Hoyt Creek, where Ryen Aasheim and Ty Smith had been rearranging things with the Caterpillar. When that project is finished, Stone will have a steady source of clean water for his pasture, which means that he'll have to spend less for irrigation in the future. "This makes us better cowguys," he says. "We're putting more pounds on our cows, and we've got grass in the bank at the end of the season."

Stone has money in the bank too, thanks to the conservation easements he recently placed on all **2,200** acres of his Rolling Stone Ranch. Under an innovative arrangement with the U.S. Fish & Wildlife Service, Stone was paid cash for the easements; other landowners have been paid by private groups, or given tax credits. "I got more than **\$150,000**," Stone says. "I used part of that to buy this ranch from my parents. The rest I socked aside to take care of a rainy day." Stone's neighbors have used easement funds to pay off mortgages,

buy adjoining land and make improvements on their property. The easements limit future development in the watershed, so that the Big Blackfoot landscape will remain a place of mountain vistas and rolling ranch land—unlike the fast-growing Front Range of the Rockies.

"If you drive through here a hundred years from now," says Ryen **Aasheim**, "it's going to look like a connected landscape—not one that's subdivided and compromised. That's because the people who live here are taking the long view of things."

This means that Jim Stone might someday pass his ranch **intact** to his son, Brady Dean Stone, now 7. "Mother Nature's got a chance here," says the elder Stone, waving his arms at the immense Montana sky. "And I'm happy because there's a chance that my son can do this ranching thing if he chooses."

Like many in his community, Stone thinks of ranching in family terms, just as Norman **Maclean** thought of fly-fishing as a family affair. **Maclean** has been dead for 17 years, but his son, John, still haunts the Big Blackfoot River, like his father and grandfather before him, and he is grateful for the opportunity. "I'd say the restoration has been a success," says John **Maclean**, a former Washington correspondent for the *Chicago Tribune* and the author of several nonfiction books. "The tributaries are in better shape, and the fish are bigger than I've seen them in the last decade."

That's the good news. The bad news is that a long-running drought, which began in 1999 and persists today, is killing many of the young trout in the Big Blackfoot system. The system is also under increased fishing pressure, now that the big trout are back.

"I don't fish the Blackfoot in the summer—too damn many fishermen and too much boat traffic," says **Maclean**. He admits that it was his own father, along with Redford's movie, that triggered the crowding, sustainable only because of the river's catch-and-release rules. Because of them, many of the Big Blackfoot's trout are caught again and again. "Boy, some of those fish look like they've gone 15 rounds with Muhammad Ali," **Maclean** says "I don't know that it hurts the fish, though. They're in the river."

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