MONTANA "STEELHEAD" Some Treasure State trout rival their Pacific Coast brethren in size. The key is the right mix of environmental ingredients, such as those found in many rivers and reservoirs and in the fertile prairie lakes of the Blackfeet Indian Reservation.

JAMES MCDAVID

A RECIPE FOR BIG TROUT

Start with a **cold, clean river,** add **organic elements** and compounds that increase fertility, **warm the water** slightly in **sunshine,** then make sure too many fish aren't competing for food. Mix thoroughly. **Serves many happy anglers.**

BY JEFF ERICKSON

Up until that point in my young life, it was by far the biggest trout I had ever seen. My dad and I crouched behind cottonwoods along the bank of the lower Gallatin River near Bozeman Hot Springs. "That brown must be at least five pounds," Dad said. The massive trout swayed leisurely just under the surface, tight against a large, downed cottonwood. Every so often it would tilt its snout upward to casually intercept an imperceptibly tiny insect floating past.

Even at 14, I knew that such a massive trout was typically caught with bait, a lure, or a streamer rather than with a dry fly. Dad encouraged me to try anyway. So I heaved out a few sloppy casts until the big brown sensed our presence and, to my great disappointment, slowly sank under the tree and disappeared.

I'll never forget the thrill of casting to that massive fish. Even now, years later, the sight of a big trout sipping dries always gets my adrenaline going. I've hooked and landed more than a few over the decades, and in doing so have learned a lot about how trout grow to trophy size and why fish in some Montana waters grow bigger than those in others. ▸▸

LOTS OF FOOD

In addition to clean, cold, and abundant water—which salmonids of all sizes require—large trout need plenty of food. "To grow big, trout have to either eat a lot of little things or some big things—and then live a long life," says Mike Hensler, FWP fisheries biologist in Libby.

Some of Montana's most productive trout food factories are highly fertile tailwater fisheries like the Missouri River below Holter Dam and the Bighorn River downstream from Yellowtail Dam. Water released from the base of dams is rich in nutrients from the lake bottom and maintains moderate temperatures and steady flows year-round. Minuscule insects like midges and tiny animals like scuds thrive in these gentle, slow waters. So prolific do the little creatures get that trout can grow large simply by staying in one spot and feeding on the rich array of aquatic life flowing past.

But a trout can become only so big feeding solely on zooplankton and aquatic insects. To grow longer than 20 inches, it needs a more substantial diet. For instance, browns feed on insects throughout their lifetime, but at an early age they also start eating minnows, leeches, and crayfish. As they grow bigger, they even consume mice and voles that tumble into the river. Bull trout, which can reach 25 pounds in Montana, switch from an insect to fish diet early in life. As bulls get bigger, so do their prey. Anglers on the Blackfoot River or South Fork of the Flathead regularly report reeling in a nice cutthroat only to have a bull trout swim up from the depths and devour their catch.

The ultimate weight-gain food for trophy trout is the kokanee, a small lake-dwelling salmon that lives in some western Montana reservoirs like Lake Koocanusa. Hensler says that the large rainbows and bull trout taken from the Kootenai River below Koocanusa get big by eating the small salmon that pass through the turbines of Libby Dam. "No other prey offers the caloric intake of a kokanee," he says. "They're like candy bars for fish."

Trout grow massive below other dams too. In the 1970s, the famous fly-fisherman and author Gary Lafontaine wrote of catching huge browns below Hauser Dam on the Missouri River using streamers to mimic suckers and other forage fish disoriented or injured after coming over the spill gates.

Of course, what qualifies as a "big" trout is both relative and subjective. In Montana's most productive rivers, 20 inches is generally the threshold for hugeness—except in some lower stretches, where anglers occasionally hook into fish 24 inches or longer. Yet in headwater streams, where trout rarely top a foot long, a 13-incher is considered massive. And to a kid catching his or her first trout, even an 8-incher can be a trophy.

GEOLOGY, CHEMISTRY, FERTILITY

To grow big trout, a lake or stream needs the right combinations of water chemistry and fertility, which are determined by a watershed's geology. "Carbon, nitrogen, and phosphorous in the soil are the building blocks for algae, which feed insects, which in turn trout need to grow," says Pat Saffel, FWP regional fisheries manager in Missoula. Those ideal conditions exist in north-central Montana, once a vast seabed covered in the calcium-rich shells of clams and other aquatic life. Small lakes in this region, like the famous ponds of the Blackfeet Indian Reservation, grow football-sized rainbows that gorge primarily on scuds, or freshwater shrimp, that thrive in the fertile waters.

Another example of geologically fertilized water is the Madison River—and eventually the Missouri River and its productive upper reservoirs. The aquatic life in those waters thrives in the fecund mix of iron, sulfur, sodium bicarbonates, and other elements and compounds brought to the earth's surface by mudpots and geysers near the river's source in Yellowstone National Park. Though best known for its abundant 15- to 17-inch trout, the Madison can produce huge fish too. In 2006 a local guide caught a 30-inch, 10-pound brown on a caddis pupae in the stretch between Hebgen Lake and Quake Lake.

Some of Montana's biggest trout live in streams that benefit from a food chain enriched by calcium carbonate dissolved when coldwater springs percolate through limestone bedrock. Among the best examples of these are the famous Paradise Valley spring creeks feeding the Yellowstone River: Armstrong/DePuy and Nelson's. Another place where trout grow big is in reservoirs, such as Canyon Ferry and Holter. They produce abundant insects and prey fish that fatten trout, and the lack of current saves the trout energy they can put into growing larger.

Highly fertile water can be a mixed blessing. For instance, Georgetown Lake grows big trout but also vast amounts of aquatic vegetation that make it susceptible to winterkill. That occurs when snow blocks sunlight, causing plants to die and stop producing oxygen needed by fish. The plants also decompose, a process that sucks up remaining oxygen.

Such rich nutrient levels are rare in mountain headwater streams. Though essential for cutthroat trout and bull trout spawning and rearing, those scenic, crystal-clear creeks can't grow large fish. Fed by ice-cold snowmelt, most mountain streams run through bedrock containing few minerals. What little life-providing organic matter they do have comes from decaying tree branches and conifer needles that fall into the stream.

Farther downstream, where that same stream emerges from shady forest into sunny and fertile bottomlands, it's a different story. Big trout—browns especially—show up more frequently in middle to lower stream reaches, where the water warms slightly and the substrate is richer in nutrients to support larger and more diverse aquatic life. Those waters also contain abundant logs and undercut banks that fish use to escape predators and live longer.

That's also the main reason browns grow bigger than rainbows and cutthroat trout in many Montana rivers: The species is better suited to the warmer lower stretches. Cutthroat in particular require colder, cleaner waters, which are far less productive.

ROOM TO GROW

Just as a bull elk needs to escape hunters for five or six years to grow a seven-point rack, a trout can't reach trophy size—or get caught again by another angler—if it ends up as someone's dinner. That's the logic behind catch-and-release.

Yet what's often not understood by anglers is that many trout actually could grow bigger if some rival trout ended up in the frying pan. "Geology and water define the physical and chemical characteristics critical to fish growth, but fish density determines the rest," says Travis Horton, FWP regional fisheries manager in Bozeman. No matter how productive they are, all streams and lakes have fixed "carrying capacities" and can produce only so many pounds of fish per acre. "Just like a pasture can support only so many pounds of

Writer Jeff Erickson lives in Helena.

FOOD FACTORIES Most of Montana's biggest trout reside in waters that produce large quantities of food the fish need to grow big and fat. Clockwise from top left: Scuds are tiny freshwater shrimp found in many tailwater fisheries and prairie ponds; some trout can grow big eating just mayflies if the current is slow enough; larger trout consume minnows and other small fish; the most fattening forage are kokanee, a small salmon species found in some reservoirs; dams provide steady water temperature and flows conducive to growing big fish.

CLOCKWISE FROM UPPER LEFT: WIKIPEDIA; SHUTTERSTOCK; SHUTTERSTOCK; SEATTLE AQUARIUM; STEVEN AXRE

THE GOOD NEW DAYS? The Wall of Fame in Dan Bailey's Fly Shop in Livingston displays silhouettes of trout over 4 pounds caught in the Yellowstone and nearby waters during the 1960s and '70s. With the advent of catch-and-release, the store stopped making new additions, which were encouraging the harvest of large trout that otherwise could be caught again. Though the wall seems to represent the glory days of Montana fishing, in fact the Yellowstone and other Montana trout rivers—thanks to catch-and-release and laws protecting water quality and habitat—continue to produce as many big fish as ever.

JEREMIE HOLLWAN

BIG MO RAINBOW Water released from the base of dams like Holter on the Missouri River are packed with nutrients that accumulate on the bottom of the reservoir. By midsummer the water downstream is a rich soup of aquatic and plant life that fosters the growth of large trout.

cattle, a lake or stretch of river can only support so many pounds of fish," says Horton. "You can have lots of little fish, or fewer bigger fish, or some combination. But it's rare, except in cases where the water is super fertile, like Georgetown or the Missouri below Holter, to have lots of big fish. Most aquatic systems simply can't support that."

According to Horton, rivers with lots of food but poor reproduction generally create the biggest trout because fish densities there are lower. "That's what you see on the Missouri below Ulm," he says. "That population has limited spawning habitat, so you don't have that many fish in the river, but you do have warmer water and tons of productivity."

On upper Rock Creek south of Missoula, where brown trout have recently overpopulated, Saffel says that harvesting more younger, pan-sized browns in the 10- to 13-inch range could improve the quality of the fishery. The reduction would make available more food to remaining trout to grow faster while reducing stressful crowding that hampers fish growth.

Similarly, on the Ruby and Beaverhead Rivers "additional harvest would help make room for some of those fish to grow faster and bigger," says Matt Jaeger, FWP area fisheries biologist in Dillon. "Those are incredibly productive rivers, but they aren't producing as many big fish as they could be."

Tim Tollett, a longtime outfitter on the Beaverhead, Big Hole, and Ruby Rivers and owner of Frontier Anglers fly shop in Dillon, believes that he and other guides would benefit from the increased harvest of smaller trout. "Our clients would catch bigger fish, and that's money in our pocket," he says.

There's no one-size-fits-all solution to making fish bigger, Saffel says. The effect of harvest on trout populations varies by species, fish size, and the waters where trout swim. "For instance, cutthroat on the upper Bitterroot have responded unbelievably well to catch-and-release," he says, because the species is so easy to catch it can be quickly overharvested. But because browns are harder to catch, Saffel adds, "it's really hard to overharvest brown trout."

WORTH THE TRADE-OFF?

FWP doesn't manage any fisheries specifically to produce trophy trout. "Our goal is to manage habitat and populations so they are as healthy as they can be," says Jaeger. "We try to provide the fishing experience that most anglers desire: the opportunity to catch plenty of trout with the chance for a trophy." Some trout harvest is allowed in most Montana rivers, but so few anglers keep fish these days that current harvest levels have no effect on populations. Saffel notes that in certain waters, regulations encouraging "selective harvest"—keeping a certain size range of trout—could produce more big fish or at least increase average fish size. But the trade-off would be fewer trout overall.

"It's up to anglers and what they want," says Saffel. "Right now the predominant approach on rivers is to release trout, and that has helped produce the great fishing you see in Montana today. But if anglers decide that they want some rivers to produce larger trout, we'd need to find some new ways of increasing harvest."

I was pondering all these complexities not long ago while battling the biggest trout of my life—a steelhead-sized rainbow. Unsurprisingly, I hooked it in water that had all the requisite components for raising such a monster: the Missouri River just below Hauser Dam. Unlike the big brown I saw with my dad years before, this massive trout took my fly. After easing it into the shallows and taking a few quick photos, I removed the hook and watched the arm-length rainbow glide safely back into the depths.

It was a fish I will remember for the rest of my life, a memory illuminated by something Mike Hensler, the Libby biologist, told me. "Catching big trout isn't easy," he said. "There aren't that many of them, and one reason they got big is because they are hard to catch."

Where to find the state's biggest trout

Montana is packed with many of the nation's most productive trout streams, rivers, and reservoirs. All grow big fish, but some produce more trophies than others. Listed here are waters where anglers have their best chance of catching particularly large trout.

RIVERS
- Lower Sun
- Missouri between
  - Cascade and Holter Dam;
  - between Ulm and Great
  - Falls; below Fort Peck Dam
- Lower Beaverhead
- Lower Gallatin
- Big Hole
- Madison below Hebgen Dam
- Marias below Tiber Dam
- Musselshell
- Lower Bighorn
- Yellowstone below Livingston
- Kootenai below Libby Dam
- Upper Clark Fork

LAKES and RESERVOIRS
- Canyon Ferry
- Hauser
- Holter
- Deadman's Basin
- Georgetown
- Koocanusa
- Blackfeet Reservation Ponds

WILL JORDAN

BILL MCDAVID

BACK YOU GO Releasing a big trout like this massive brown gives other anglers a chance to catch it down the road. But on some rivers, harvesting more trout in the 10- to 13-inch range could provides additional food and room for other fish to reach larger sizes.