PHOTO ILLUSTRATION BY LUKE DURAN

Montana's fluvial arctic grayling could be doomed if the beleaguered fish don't get more water soon

Left in the dust?

BY TOM DICKSON

The stream is hardly a trickle, maintained in midsummer only by faint underground springs. But between its narrow banks swim tiny fish that offer hope for one of the nation's most beleaguered aquatic species.

Under a blazing sun on the open, treeless steppes between the Gravelly and Snowcrest mountains in southwestern Montana, I am following Montana Fish, Wildlife & Parks fisheries biologists Jim Magee and Peter Lamothe along the serpentine headwaters of the Ruby River. The biologists are looking to see if arctic grayling reared here earlier this spring have survived.

"Here's one," says Magee, peering down into a sink-sized pool. "Here's another."

"I've got a bunch down here, four, five, six," says Lamothe, walking quickly ahead. "Ten, eleven, twelve. There's a lot."

The excited biologists move faster, as if chasing the 2-inch grayling downstream, leap-frogging past each other, calling out the number of fish they see. After half an hour, they've identified roughly 100 young-of-the-year arctic grayling, far more than they thought would survive in this sun-baked stretch of river. "This is fantastic!" says Magee.

Good news like this has been hard to come by in recent years for Magee and others working to save this unusual salmonid. As FWP's arctic grayling specialist since 1997, Magee has watched the state's dwindling fluvial (river) arctic grayling population teeter on the edge of federal endangered species listing. Over the past century, due to dams, habitat loss, competition from introduced trout species, and overfishing, Montana's fluvial grayling distribution has shrunk 96 percent from its historic range in the upper Missouri Basin. Compounding the problem has been a series of droughts, beginning in the late 1980s, that at times have reduced stretches of grayling water to bars of dry gravel.

But Magee remains hopeful. He notes several gains made in recent years—Big Hole ranchers volunteering to divert less water from the river, the first-ever documented natural reproduction of stocked fluvial arctic grayling, the restoration of streamside willows, and a budding natural incubation program that holds promise for restoration.

The grayling has long been prized for a remarkable, iridescent beauty beyond even that of the trout species. "At times the entire fish has a silvery or brassy sheen as though wearing an ancient suit of mail," wrote the great fishing author A. J. McClane,

There is no consensus among grayling advocates on how best to save this aquatic jewel. Some say the species is so close to extirpation (local extinction) it should be listed under the Endangered Species Act. Others maintain that federal listing would only drive a wedge between conservationists and the ranchers whose land borders arctic grayling waters.

Yet all agree that efforts to save arctic grayling will likely be in vain if the current drought, which has plagued the region since 1998, doesn't let up.

"If we don't get some water soon, grayling will be in real trouble," says Magee.

SHRINKING POPULATION

That's a big "if." Southwestern Montana has suffered from extreme drought for the past five years, and the below-normal snowpack in the Beaverhead, Pioneer, and Blacktail mountains this past winter will likely limit stream flows in 2004.

Grayling in Montana have never had it

TOM DICKSON

DOWN HERE SOMEWHERE On the upper Ruby River, FWP biologists Peter Lamothe (in snorkeling gear) and Jim Magee search for grayling tagged with radio transmitters.

easy. They are primarily a fish of the far, frigid north—Alaska, Canada, and northern Europe and Russia. Historically, the only populations in the lower 48 states were in Michigan and in Montana's upper Missouri headwaters. Michigan's populations disappeared in the late 1930s due to deforestation and overfishing. Having evolved in the arctic, where food is scarce, the grayling attacks prey with abandon and is easy prey for anglers. Wrote Izaak Walton, "He will rise twenty times at a fly, if you miss him, and yet rise again."

By the late 1970s, the only remaining fluvial grayling in Montana swam in the Big Hole River. Those in the Ruby, Sun, and other upper Missouri rivers had died out due to dams (which prevent the fish from migrating), siltation (which smothers eggs) from logging and cattle grazing, competition from introduced species, and global climate change.

According to Chris Thomas, a professor of conservation biology at England's Leeds University and an expert on global warming and species extinction, a link between rising global temperatures over the past century and declining populations of sensitive cold-weather species such as arctic grayling seems likely.

> "Grayling have disappeared from those rivers for a reason."
>
> JIM MAGEE,
> *Montana FWP Grayling Specialist*

"Although the entire arctic grayling species may not be at risk of extinction worldwide, it can be expected to disappear from large parts of its distribution as conditions get too hot or dry due to climate warming," Thomas says.

That became apparent in Montana during the drought of 1988, when the Big Hole ran so low that some upper reaches went dry. Grayling numbers plummeted, from an average of 100 per mile to just 22 per mile.

In response, FWP restricted grayling angling on the Big Hole to catch-and-release only. It also established a working group of state and federal biologists and private interests who developed an arctic grayling restoration plan to protect and enhance the fast-disappearing population.

But the plan didn't go far enough for some grayling advocates. In the early 1990s, citing the plan's inadequacy, two environmental groups petitioned to have the grayling listed for protection under the Endangered Species Act. The U.S. Fish and Wildlife Service agreed the grayling was in danger but categorized it as "warranted but precluded." That meant the species warranted federal protection but was precluded from listing because Montana had a restoration plan in place. To forestall ESA listing, FWP agreed to continue grayling conservation work it had begun on the Big Hole and to restore grayling populations on other rivers.

Conserving grayling on the Big Hole requires protecting and restoring coldwater habitat—deep pools, clean spawning gravel, and, especially, an abundant supply of cold water. The river flows in a 150-mile arc, bearing north from its headwaters on the Idaho border then eastward to meet the Beaverhead and Ruby rivers at Twin Bridges to form the Jefferson. For much of its length, the Big Hole Valley is at an elevation over 5,000 feet, where melting snowpack in surrounding mountains feeds the

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Tom Dickson is editor of Montana Outdoors.

CHUCK HANEY

PAUL F. UPDIKE

CHUCK AND GALE ROBBINS

SPLENDID SPECIES "The French value grayling so highly," wrote Izaak Walton, "they say he feeds on gold." Though it actually feeds on aquatic insects, the grayling is no less prized in Montana, especially among anglers who value its beauty. In the Big Hole Valley, the elegant fish competes with irrigated hay fields for limited water. Rather than let courts determine winners and losers, ranchers, scientists, and anglers have been meeting to find ways to provide enough water for both cattle and grayling.

river through spring and much of the summer, keeping river temperatures cool.

Though it looks as lush as the Irish countryside, the Big Hole Valley actually sits in a semi-arid sagebrush benchland, where rain falls infrequently. When irrigated, however, the valley greens up and produces abundant hay, the area's economic lifeblood for the past 100 years.

What's good for cattle feed, however, is often not good for salmonids. Every gallon of water diverted onto fields for grass or grazing pasture is one less gallon available for grayling. Recognizing that their cows and a potentially endangered fish species share the Big Hole River's finite water supply, local ranchers joined with outfitters, government agencies, and conservation organizations such as Trout Unlimited to form the Big Hole Watershed Committee in 1995. The consensus-based group formulated a plan for keeping river flows at or above the minimum level necessary to maintain streambed habitat as determined by FWP studies. Below a certain point, members agreed, low water flows would trigger mandatory restrictions by anglers and voluntary water conservation efforts by ranchers.

"Many of these ranchers have given up significant amounts of water," says Randy Gazda, a U.S. Fish and Wildlife Service biologist at Dillon who works with Big Hole landowners to enhance grayling habitat.

Using state and federal funds, 20 cattle watering wells have been drilled in recent years to help ranchers conserve river water. Other habitat conservation work in the watershed includes improving grayling habitat on tributaries and restoring riparian (riverside) areas. On the banks of a 1.5-mile stretch of Steel Creek, a Big Hole tributary, willows were planted in 2003 to shade the river and reduce stream bank erosion. New fencing is protecting the young willows from grazing cattle. In April 2004, a previously channelized 800-foot stretch of Fishtrap Creek was reconfigured to create pools, riffles, and other in-stream habitat.

FIVE ADDITIONAL POPULATIONS

Despite such progress on the Big Hole, arctic grayling are still at risk if new populations aren't established in other rivers. "The Big Hole makes up only about 4 percent of the historic grayling range in Montana," says Magee. "Even if we completely restore that population, the species will be vulnerable to extinction and could still be listed under the ESA."

That's why the USFWS has also asked Montana to reestablish fluvial arctic grayling populations within historic drainages in the Ruby River, the North and South forks of the Sun River, the lower Beaverhead, and the Missouri River headwaters (which includes the lower Gallatin, Jefferson, and Madison rivers, and the mainstem Missouri River to Toston).

"Grayling disappeared from those rivers for a reason," says Magee. Biologists working on several research projects over the past decade have been working to better understand why. One study found that grayling don't spend enough time feeding when forced to chase exotic rainbow trout from prime holding lies. Another found that removing streamside vegetation on the Big Hole resulted in fewer deep pools and holding lies. An ongoing study is following radio-tagged grayling in the Big Hole and Ruby to track their movements and understand what types of habitat they use.

The restoration effort also focuses on rearing grayling for stocking. Fertilized eggs from Big Hole–strain brood stock kept in brood lakes and the USFWS Bozeman Fish

JEFF HENRY

LIZ LEWIS

MANY QUESTIONS To learn more about Big Hole grayling, FWP biologists monitor the population each year to see how numbers respond to water flow and temperature. To successfully restore grayling in other rivers, scientists are working to understand exactly how dams, siltation from logging and cattle grazing, competition from other species, overfishing, and global climate change caused the species to disappear.

JEFF HENRY

Technical Center are reared in state hatcheries to roughly 8 inches before being stocked. Most of the restoration rivers have been stocked intermittently since 1997, with varying degrees of success. The best results have been on the upper Ruby, where, in 2000, stocked fluvial grayling reproduced for the first time.

FWP biologists are now conducting an experiment to learn if young grayling survive better when early development takes place in the river. Fertilized eggs taken from brood stock are placed in "remote site incubators"—porous 5-gallon buckets containing gravel set into the upper Ruby and several tributaries. After 18 days, the mosquito-sized fry are released into the stream to fend for themselves.

"The idea is that these young grayling will be wilder and heartier, and that they will imprint on the feeder stream and return there to spawn," says Magee.

DIFFERENT MEANS

Montana grayling numbers continue to remain low, despite progress with ranchers and research, causing some grayling advocates to again call for federal regulation. In 2003, two environmental groups sued the USFWS for failing to list the fluvial arctic grayling as an endangered species. In their argument for listing, the Center for Biological Diversity and the Western Watersheds Project argued the voluntary irrigation restrictions were not protecting sufficient water in the Big Hole and that FWP had not established self-sustaining populations on other rivers.

"This is a crisis situation," says Jon Marvel, executive director of the Western Watersheds Project. "The lethargic process developed by FWP and the USFWS is turning into a death sentence for grayling."

FWP officials and Big Hole Watershed Committee members maintain that the restoration plan is working. They point out that voluntary restrictions have kept the Big Hole from drying up in recent years, as happened in some reaches in 1988.

"The ESA mainly affects federal land and activities, but the Big Hole runs through private land," says Magee, "For grayling restoration to work over the long haul, we need the cooperation of the ranchers."

But Marvel disagrees, maintaining that at some point the ESA is the best way to ensure endangered salmonids get the water they need to survive. "We've successfully sued individual water rights holders in Idaho and now have water back in streams where endangered salmonids swim where it hadn't been in 85 years," he says.

The decision whether to list the grayling rests with the USFWS. According to Lori Nordstrom, a federal biologist in Helena who works on ESA issues, the plaintiffs and the federal government are now filing and responding to briefs. Later this year, a federal circuit court judge in Washington, D.C., will likely decide whether to hold a hearing on the case or dismiss it.

Back at the Ruby River headwaters, I follow the biologists to the truck, pausing momentarily to look back at the tiny tributary. In this parched landscape, it seems to me improbable that such a fragile wisp of water could play a part in saving Montana's struggling arctic grayling population. Magee, however, won't be put off by my skeptical observations.

"You wait for years to see something like this, to see juveniles in here," he says as we climb into the truck. "What we saw on this tributary today is real encouraging." Then he glances up at the sky, where the sun has been beating down all afternoon, and adds, "Let's just hope it doesn't dry up on us."