Like a Fish Out of Water

By Debbie Drews

The unseen impacts of catch-and-release.

Catch-and-release has become an ingrained fly-fishing habit. It’s been the only way to fish for so long, that for many, it’s hard to imagine an alternative. But is catch-and-release, as practiced, still an important tool in fish conservation and fisheries management? Or, has it become *Smithsonian* journalist Alastair Bland’s “wicked game of torment?” Like our prized Montana streams, one thing is crystal-clear: whatever the rationale or the ethics, fish are dying from poor handling and laissez-faire attitudes. So how can we be certain that the river’s “gift,” as Lee Wulff described trout, keeps on giving?

There’s no doubt that catch-and-release made our love of the chase okay. Motivated by conservation, catch-and-release transcended empty bellies and vulgar pot-hunting to sport hunting with an eco-conscience. Anthropologist Matt Cartmill’s “clean-plate ethic” called to many that felt uncomfortable with killing. Catch-and-release, or fishing for fun as it was originally coined, is not just fun; it makes us feel good about our generosity of spirit in giving a worthy adversary another chance at life. It’s management as morality. However, as Jack Jelinski, Montana State University Professor Emeritus, tells it, “if you fish—no matter how elegant your gear or how poetic the language you use to describe the experience—you are engaging in a behavior of predation.”

And to contain our much-debated hunting imperative, we’ve developed angling ethics. But ethics are never black and white. Some believe it’s wrong to chase and catch an animal for sport, and that the idea of fish feeling no pain is as ludicrous as when Descartes first theorized it. Others believe that it’s impossible for us to consider animals as equals, especially animals that live in a watery alien world with which we cannot empathize. John Varley, former chief of the Yellowstone Resources Center, and local author Paul Schullery recognized back in the 1980s that although trout are undoubtedly the most famous and celebrated residents of our waterways, there is a difference in the way fish are treated compared to other wildlife. “Even if catch-and-release killed no fish, we cannot equate the treatment of fish with the treatment of mammals; would we ever allow mammals to undergo similar treatment?” It’s hard to imagine it being legal or morally sound for people to chase deer and elk through the woods, blasting them with paintballs or tranquilizer darts.

The first time I held a fly rod, I had a perfect—albeit tiny—cutthroat on my line within seconds; I nearly peed myself with excitement.
So, ethics aside, I get it. And while it’s necessary to remind ourselves of the everyday piscine inequality and pure brutality that we practice, it doesn’t necessarily matter what your angle is. Everyone is big enough and old enough to make those decisions. What matters in this conversation is how we measure the efficacy and ultimate success of catch-and-release angling. How many fish really survive? And, just as important—perhaps moreso—how many thrive? To use Paul Guernsey’s words, “what’s beyond”

Somewhere in the middle of their brochure on catch-and-release fishing, the National Park Service states, “Not all fish caught and released.” As with most things, to borrow a familiar editor’s phrase, “there’s a gulf between the idea and the execution.” And, there’s a boatload of factors that contribute to released-fish mortality. According to research, the biggest three are hooking location, handling, and air exposure, and water temperature. In 2014, there were over two million angler days in Montana. According to a U.S. Fish & Wildlife Service study, an average of seven fish are caught per day—assuming these numbers are correct, that’s more than 15 million fish statewide. One-third of Montana’s angling happens in Region 3, which covers southwest Montana. So, if we fish the most—that comes to about five million fish caught per year.

FWP’s Region 3 fisheries manager Travis Horton says that the “current literature” puts release-mortality increased significantly with elevated water temperatures (when most angling takes place)—up to 28% for mountain whitefish on the Smith River and 8% for rainbow trout. Fighting fish to exhaustion and poor release techniques drive those numbers, and assuming that the vast majority of fish caught were not kept for dinner, simple math leaves up to a million dead fish in southwest Montana rivers—a waste not tolerated when it comes to game of the four-legged kind. Even using conservative estimates, a minimum of 100,000 released fish die every year.

Although averages, of course, can be misleading, and so far we’ve been talking average anglers—not the pros. Outfitters and their guides are paid to know where there are fish; that’s what they do, and here in Montana, they’re really good at what they do. Whether you’re a fishing report is enough to show that the art of fly fishing has become a technological one. Guides are out late and up early, so they know what the conditions are, and when and where the next hatch will be. Last year there were 377 licensed outfitters and guides in Montana—up by nearly a third from 2014. We’re all familiar with a “bear-jam,” but longtime fly-fisherman Jelinski tells of one caddis hatch on the Madison where “there was a glut of eight or ten guide boats, all with clients on board, queuing for space, and pulling in so many fish that it broke my heart.”
Catch-and-release may theoretically be about the chase, but for many, it's all about the catch—as long as they don't have to keep 'em, that is. An old *Field & Stream* article reveled at the ease of catching the “cooperative” and “gullible” cutthroats in Big Sky country in the early ‘90s. You could practically hear the suitcase zippers and see waders and tackle disappearing into that distant plane hold.

More than a third of Montana's anglers are from out of state; in fact, in 2002, the Montana Board of Outfitters reported that 97% of all guided trips were with non-residents. In North America, it is generally recognized that at least 60% of fish caught by recreational anglers are released—and that number is likely much higher in southwest Montana, where the catch-and-release ethic runs strong. In 2013, on the Madison, one of the three most-outfitted rivers in Montana, more than 80% of anglers were fly fishermen, and only one-third were residents. Considering airline baggage costs, it's a fair bet that our out-of-state visitors prefer to take home big stories rather than big coolers. Case in point: a 2011 study reported that 94% of all fish caught in Yellowstone National Park were released. That's probably not surprising considering that release is required for all native fish; however, more than half of the fish caught were non-native. Even 40% of the villainous lake trout were released.

In the legal case against ARCO for river pollution from mining wastes in the 1990s, researchers focused on rivers in southwest Montana. And, perhaps not surprisingly (to us anyway), the Gallatin, East Gallatin, and the Madison had the highest catch rates and bagged the most angler-hours. More than half of the 1,344 fishing trips in that study were to just five rivers: Rock Creek, the Bitterroot, the Big Hole, the Missouri, and our own perfect trout stream, the Madison. On a good day with a guide, the average angler catches over 20 fish. If we take these less-conservative, guided-trip catch numbers into account, and consider that the majority of out-of-state anglers will be releasing fish, we're most likely experiencing significantly higher catch-and-release fish mortality than the estimates mentioned earlier—particularly in southwest Montana. This could mean up to 100,000 fish on the Madison River alone, many of them from catch-and-release angling by guided fly fishermen.
Which is not to say that guides and outfitters are the problem. Indeed, many guides are ardent conservationists and realize how important their role is in protecting fisheries. According to Matson Rogers, owner of Angler’s West in Emigrant, “As outfitters and guides, we need to make a concerted effort to teach anglers, and to be good role models—which means fewer grip-and-grin photos. It’s really important to keep the conversation going and to foster good practices.”

Furthermore, direct release mortality isn’t the only thing at issue. There’s a plethora of scientific studies that have concluded that the “sub-lethal” effects of catch-and-release angling, although highly variable, can be significant. **Debilitating hook injuries can reduce a fish’s ability to feed by 50%**. Not only does physical stress from capture and disturbance—especially in summer, when the water is warm and pressure at its highest—disrupt the time spent feeding, it also increases a fish’s vulnerability to other opportunistic organisms, disease, and fungal infection. Reduction in feeding results in up to a 15% reduction in fish growth, while physical stress from handling and “fighting” also increases a fish’s metabolic demand for energy. Not surprisingly, **excessive playing, handling, and air exposure shoots fish stress levels through the roof**. In combination, the varied responses by fish to catch-and-release angling stressors divert energy that otherwise would have been used for sperm and egg growth, causing delayed ovulation and reducing the likelihood of progeny survival.

![Fish](https://via.placeholder.com/150)

What does this amount to? Smaller, less-fit fish, and fewer of them. Horton agrees: “Montana’s fish have high fecundity, in that they have high reproductive capabilities, but there’s no doubt that fish are not attaining the sizes they used to.” Given current densities and their effect on growth, he points out, “fish are going to top out at 18-22 inches in length and stay there in most of our rivers.”

**Multiple captures of individual fish, common in many trophy-trout fisheries, further compound the issues of sub-lethal injury.** In 1986, researchers documented that adult cutthroat trout were recaptured up to ten times on the Yellowstone River during one fishing season (40 days), with one individual being caught four times in a 24-hour period, and others within just two hours of the first capture. Not surprisingly, researchers Aaron Batholemew and James Bohnsack calculated that the cumulative mortality risk for a fish recaptured several times increased dramatically. For example, **a trout caught ten times, with a mortality rate of 22% per release, has a 90% cumulative probability of dying.** Like that goldfish you had as a kid, that gift will be lucky to survive the season—and may not survive to breed. If the lifespan of a rainbow trout is seven years, what is this doing to the population as a whole?

To shorten the odds still further, there’s “delayed mortality” from stress or injuries sustained during capture. Delayed mortality can give a misleading impression that fish always survive when released. **A 1992 study concluded that after exhaustive exercise and air exposure for 60 seconds, as few as 28% of rainbow survived a full 12 hours.** Even when healed, debilitating jaw injuries in salmonids seriously reduce fish condition and increase vulnerability. In 2006, Yellowstone Park introduced barbless hook restrictions. At the time, Park biologist Todd Koel stated that there was no biological reason for the change. “From a mortality standpoint, we can’t justify the change,” Koel said. “But from an aesthetic and visitors’ point of view, barbless hooks help; deformed-looking fish can negatively affect [the fishing] experience.” The world’s first national park restricts the use of barbed hooks because they don’t want visitors to see ugly animals, not necessarily because barbless hooks contribute to lower mortality rates.

A few years ago, Jelinski met with USGS research biologist, Julie Meka, during a study of the catch-and-release effects on Alagnak River rainbow trout in Alaska. Meka noted that restrictions had recently been placed on the fishery due to the reported high incidence of hooking scars and decreasing fish size and abundance. Meka’s team observed that over 90% of fish caught in the study had hooking scars—over a third of these had at least one “distinctive mutilation.” The researchers also found that the use of barbed
hooks increased the chance of hooking injury by 17%—and the hooks took significantly longer to remove, causing more physiological stress, and heightening the chance of delayed-release mortality. As Horton estimated in an unofficial “back of the napkin” calculation after FWP restructured bag limits, “On the upper Madison alone, 20,000 fish die each year from hooking mortality.”

Catch-and-release may have been proof of our enlightenment—just as Voltaire scrutinized Descartes’s thinking, catch-and-release anglers were looked upon as strange for not bringing home fish for supper in the early days. The entire rationale for catch-and-release was and is based on the premise that there would be fewer fish and smaller fish, unless we took action. The problem now is if we’re catching more, and releasing them incorrectly, then our situation hasn’t changed much.

To date, concern about fisheries has focused on global commercial fishing by-catch—discarded catch returned to the water. Increasingly, researchers are focusing on recreational activities, so far largely ignored. They believe that more than 30 billion angler-caught fish are released annually—on this basis there’s good reason for the shift in attention. Lack of visibility, an assumption that the scale of the problem is small, and disbelief that there is a problem, all factor into the illusion that fisheries management is the same as fisheries conservation.

Of course, bag limits and gear restrictions are one thing, but angler conduct is quite another. There’s no doubt that fish are dying from poor handling, and careless and irresponsible behavior on the river. Therefore, it seems like it’s time to promote and institute better training and wider awareness, in order to save our fisheries for the future. Meka concluded that initiating angler-education programs focusing on proper hook-removal and landing techniques would reduce injury rates and the sub-lethal effects of catch-and-release. Surprisingly, there are currently no formal education requirements for anglers, or even guides, in Montana. Which is why it’s not uncommon to see fishing guides holding trout out of the water for extended periods of time, generally for photos—a behavior their clients often mimic.

As Horton observes, “Catch-and-release has become a panacea in the industry, which is not correct at all! It is so pervasive in societal thinking that it has become like a religion—even to those who don’t fish!” It’s clear, then, that catch-and-release is not the only solution, and as a management tool it requires continuing research to monitor fish mortality, most notably the impacts of cumulative mortality from multiple hooking events, and a closer evaluation of the sub-lethal effects of catch-and-release on fish behavior, physical condition, growth, and reproduction. Earlier this year, there was a public outcry when Montana FWP tried to simplify fishing regulations on the Madison River that would have allowed more fish to be kept—regulations that have been in place since the 1980s. Horton notes, “While high fish reproduction means that fish numbers are not necessarily at risk, there is certainly concern that high angling pressure on our favorite rivers may become a problem in the future.” It’s easy to see how public pressure could fly in the face of resource protection.

In a 1994 interview, FWP biologist Dick Vincent said, “I’ve seen books written by numerous guides and outfitters that said the Madison was made by catch-and-release fishing, and that’s full of crap as far as I’m concerned. Fishing regulations are a nice tool, but they don’t have much to do with population densities. In fact, total biomass today is no better than it was before catch-and-release. All it did was rearrange biomass into sizes that anglers like better.” Vincent is the man whose research prompted the 1974 shift from hatchery-stocked rivers to the wild-trout fisheries Montana is renowned for today.

On some streams, catch-and-release is currently the only way to fish. But where there’s a choice, fresh wild trout—at ten dollars a pound in the store—might be too good a gift to pass up. Jelinski’s advice? Tune into the experience, and your baser instincts, and catch-and-kill—once in a while. As one Montana angler put it, “whatever happened to going down to the river, catching your three or four fish, and calling it a day?” What happened, of course, is that quantity overtook quality as a measure of the fishing experience, and 30 trout caught and released is now deemed superior to three trout caught, kept, and consumed. And there’s the rub: the catch-and-release community tends to consider its approach morally and ethically superior, but “harvest fishermen,” as a group, are likely having a smaller overall impact on the fishery.

Fishing for supper, not sport, might be a novel concept under the modern paradigm; but aside from helping to stem the tragic waste, there’s another reason this may be the way forward. It can be a method of keeping non-native invaders like rainbows and brown trout in check, and ensuring the survival of native fish like cutthroats. This must certainly be a more palatable (and cheaper) option than electrocution or toxic chemicals.

Regardless of one’s angle, catch-and-release is likely here to stay, and there are some good reasons for it—but anglers can take more precautions to reduce the possibility of discarded dead fish. Avoid needlessly playing or exhausting a fish; it’s not sporting and not safe for the fish. The use of natural bait increases the chances of mortality. Keep the fish in the water and never handle a fish with dry hands; use barbless hooks to reduce handling time. Just like drowning to us, air exposure to a fish is deadly. Angling in high summer temperatures almost certainly results in higher mortality. It’s not just about having great fisheries here in Montana, it’s about keeping them. We should lead the way with mandatory angler-education programs for private fishermen, guides, and outfitters.

If an injured and exhausted fish is simply tossed into the river, the gift rapidly reaches its expiration date, left to wash up on the shores of the Madison like so many misplaced flip-flops. We shouldn’t need to pick up after people using the river, and we shouldn’t
need to point out the obvious. Good handling techniques, less emphasis on number of fish caught, and a greater focus on the fishing experience—all these things should speak for themselves, as we spend our days casting for trout under the big blue skies of Montana.

Bibliography


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