

Catch, release and dead? How, and how long, you handle fish determines their fate.

By John Myers

Duluth News Tribune (TNS) Apr 24, 2019. Used with permission.

The email stood out among dozens waiting in the inbox on a Monday morning, and then a phone call came to rub it in.

Both contacts were from trout anglers. They were upset at one or more of the many online photographs of fish in a Sunday outdoors section story about the Brule River steelhead fishing opener.

The fish in the photo was being mishandled, they said, and probably would perish after being released. The newspaper should set a better example, both anglers argued.

And they were right.

Catch, photograph and release fishing has become so entrenched in our fishing psyche in recent years that it's almost hard to remember that keeping nearly every fish caught was once the norm in our father's and grandfather's days. Over the last 40 years the idea of fishing for fun, and releasing fish to swim another day, has spread across every aspect of the sport — from bluegills in ponds to trout in rivers and marlin in the oceans.

But simply releasing a fish is no guarantee that it will survive, which is, after all, the point of catch and release fishing: To keep the fish in the system

so it can be caught again and so it can propagate and make more fish.

If you release the fish, never touch or hold it by the gills and don't hold fish vertically. file / News Tribune



In fact, a certain number of fish caught and released die simply from being handled. How big a percentage depends on two major factors: Water temperature and handling procedures. Studies show a wide range of fish deaths after being released, what fisheries biologists call hooking mortality, from less than 2 percent for quickly handled stream trout to 40 percent for some lake trout.

That's not to say catch-and-release fishing hasn't helped sustain fish populations. It's probably the biggest reason we still have catchable numbers of walleyes, musky and trout.

But as one trout enthusiast raised the issue: If one angler catches three fish and keeps all of them to eat, and another catches 40 fish and releases them all, but 10 percent die anyhow, who has killed more trout? You do the math.

Continued on next page

The key is to reduce the mortality rates of released fish, and there are some simple keys to doing that: Land them quickly, handle as gently and as little as possible, and get them back in the water as fast as possible.

Mortality rates vary

Minnesota Department of Natural Resources studies on walleyes in Mille Lacs Lake found an average mortality of 10 percent for walleyes caught, handled and released. The number was much lower, with almost no deaths, among fish released during the winter in very cold water.

Mortality was highest in warmer water, said Tom Heinrich, Mille Lacs Area Fisheries Supervisor for the MN DNR.

"Water and air temperature are really big factors. Fish don't seem as able to survive the rigors of being caught and being in warm water," Heinrich said. "So the key is, keep it (playing the fish) short. Handle them as little as possible. Get them back into the water as soon as possible."

(Water temperatures are so critical for released fish survival that Montana restricts fishing to morning hours only when some trout streams rise above 73 degrees for multiple days.)

The Mille Lacs mortality rate is important because the estimated kill of released fish is counted against the state's annual harvest of walleye, even though the fish aren't harvested.

In some cases the mortality rate is much higher.

A study by the Michigan Department of Natural Resources's Marquette Research Station reported in 2017 showed mortality of angler-released fish averaged 43 percent when the surface water temperature exceeded about 50 degrees. Mortality dropped to 15 percent when surface water temperatures were below 50 degrees. That's 1 out of 9 fish released dead under good conditions and more than 4 out of 10 in warmer water.

A Texas study on largemouth bass caught by angling and then released in large pens found

that 22 percent of the bass had died after 72 hours. The death rate was little different for fish caught on live bait compared to those caught on artificials. Mortality rates were 48 percent for those hooked in the throat, 17 percent for those hooked in the gills and 20

percent for mouth-hooked fish.

Bob DuBois, a research scientist with the Wisconsin Department of Natural Resources, has conducted multiple studies on hooking mortality, including several on the Brule River. One study looked at brown, rainbow and brook trout caught on Mepps spinners, hooked mostly in the mouth and jaw, which saw roughly 4 percent mortality rates. Another study using live bait found up to 40 percent of deeply hooked brook trout perished after being released.



Continued on next page

This angler is using the proper support to gently release a lake trout. file / News Tribune

DuBois found some other interesting points, too, including that fish hooked in the jaw or mouth almost all survived - less than 1 percent mortality. That mirrors studies of fly fishing mortality when fish caught by a fly in the mouth had just 1-2 percent mortality.

DuBois also found that using barbless hooks makes little difference in how long it takes to remove a hook, decreasing hook-out time by only about five seconds on average.

"That doesn't mean you shouldn't use barbless hooks if you want to. But it meant that there really isn't any compelling reason to require them as" a fishing regulation, DuBois said.

The research used real fisherman under real conditions with wild fish that were then released in pens in the river to monitor.

DuBois said water temperature is a key factor to release mortality. Warmer water stresses multiple aspects of fish physiology.

"It's just a big increase in the overall stress. It's like you mowing the lawn when it's 100 degrees outside compared to 70 degrees. You're just a lot more likely to die at 100," DuBois said.

So let's break down the process of catching, landing de-hooking and releasing a fish. Here's what matters:

How long the fish is played

The longer the fight, the more exhausted a fish becomes, and the more lactic acid builds up in its body. This can cause the fish to die some time later, even after you release it to swim away.

Use tackle heavy enough for the species your after — don't use an ultralight trout rod for walleye or pike. Land the fish as quickly as possible.

How a fish is landed.

Hauling in fish over the side by the line, hanging on a hook, or squeezing it with your hand, can cause major internal organ damage.

If possible, the best thing for the fish is to leave it in the water while a hook is removed. If that's not possible use a soft rubber mesh landing net which is less damaging to eyes, fins, scales and the protective mucous membrane than a fine mesh net. While a net means the fish will be out of the water for some period, it's often the least stressful way to get a fish into your hands for a quick hook removal and release.



How long a fish is out of the water.

One study by R.A. Ferguson and B.L. Tufts looked at the amount of time a trout was exposed to air after being caught. Fish that were released without being held out of the

Continued on next page

water had a 12 percent mortality. But fish held out of the water for 30 seconds had a 38 percent mortality rate; more than one in three fish died. Fish out of the water for a full minute saw a 72 percent death rate.

Remove the hooks and gently place the fish back in the water as quickly as possible — in 30 seconds or less if possible. If you take a photograph, make it fast. Decide beforehand which fish (how long or what species) are to be kept; immediately release all others. Do not engage in a prolonged debate over whether or not to release the fish while it is out of water. (Culling, which is illegal in Minnesota, also reduces the chances of fish survival. Once you put a fish in your livewell, keep it as part of your limit; it stands a far greater chance of dying than one immediately released.)

Fish slime is essential for fish health.

If you handle a fish in a rough net, or grab it with dry hands or dry gloves, that removes the layer of mucous that protects the fish from disease and bacterial infections, which can kill the fish long after it has been released. Wet your hands before handling the fish.

How a fish is held.

Never hold a fish vertically, this can cause damage to internal organs. Never hold a fish just by its mouth or tail. Hold the fish horizontally with one hand near the front - but not near the gills - and one hand near the belly or tale. **DO NOT SQUEEZE FISH**, it can cause serious internal organ damage.

A fish's gills are its lungs.

If you touch fish gills even a little it can damage them beyond repair and the fish can't breathe." Imagine if someone grabbed you by the lungs. Never, ever touch gills. Try not to squeeze gills. Never hold a fish by its gills for a photo.

A fish needs its eyesight. Grabbing a fish by the eyes will almost certainly reduce or destroy its vision, possibly permanently. Never ever hold a fish by its eyes or touch the eyes.

Quick removal of hooks.

Getting hooks out of a fish with as little damage and time as possible.

Barbless hooks are the easiest to remove, even if you might lose a fish or two per trip before they are landed. If you don't have barbless hooks you can pinch the barb down with pliers.

Several studies of both sea and inland fish report that circle hooks, as opposed to j-shaped hooks, are much easier to remove and cause less injury to the fish. Keep a pair of long-nose pliers, a hemostat and wire cutters in your tackle box to aid in hook removal. **DO NOT PULL** on the line to release the hook.

To cut line or extract?

Sometimes it's a tough call, and opinions vary on this, but prolonged attempts to remove the hook often do more harm than good. It may be better to cut the line as closely to the hook as possible and release the fish with the hook still in it rather than rip away at a deeply hooked fish. Several studies indicate cutting the line is better. Deeply hooked rainbow trout suffered 74 percent mortality when the hook was removed compared to only 47 percent when the hook was not removed. Among the surviving deeply hooked trout with the hook left in, 74 percent shed the hook within two months. Another study found trout mortality at 55 percent when the hook was removed by hand and only 21 percent when the hook was cut off.

Continued on next page

Fish are capable of rejecting, expelling, or encapsulating hooks. Encapsulation is a process whereby the fishes' healing process causes the hook to be covered with an inert matrix of calcified material; or a-cellular tissue. Steel and bronze hooks are less toxic and are rejected or "dissolved" sooner than are stainless steel and cadmium-plated or nickel-plated hooks.

How a fish is returned to the water.

Instead of tossing the fish back, gently lower him into the water. If you need to revive the fish, move him in a figure-8 motion, or hold the fish so that he faces upstream to allow the current to flow over the gills. Never move a fish backwards as this can damage the gills.

A healthy released fish should swim away quickly

If it doesn't, something is wrong. Revive an exhausted fish by holding it upright in the water by the tail. If in a river, use two hands and hold it facing into the current. If it is severely lethargic, depress the bottom lip to cause the jaw to gape and gently move the fish forward. Moving the fish in an erratic back and forth motion will just induce more stress. (Have you ever seen a fish swim backwards?) At the first sign of the fish attempting to swim away, let it go.

Sources: NOAA Fisheries Services, Takemefishing.com, U.S. National Park Service, Angling Unlimited, Michigan DNR.
