

FEELING GOOD

WRITTEN BY
JIM WILSON

ILLUSTRATED BY
GARY PALMER

**CATCH-AND-RELEASE FISHING CAN BE A MANAGEMENT TOOL,
CONSERVATION ETHIC OR DOGMA.**

BUT DOES IT DELIVER ALL IT PROMISES?

The puppy drum was a gift, a glistening copper and white prize from the upper reaches of a Hyde County creek that had surrendered few fish this October day. In only a couple of feet of water, the drum had committed hit-and-run on a quarter-ounce gold spoon, first surging away and then charging the boat when I tried to apply the brakes with a lightweight spinning outfit.

After one lap around the boat and another dash toward the shore, the fight ended. It wasn't a big drum—about 5 pounds or so—but it was a good fish, one to be appreciated on a day when only a few pumpkinseeds had shown an inclination to bite in a stretch of blackwater that, because of drought, was much more saline than usual. Largemouth bass are usually abundant here, but the only one I'd seen was floating dead with several lesions on its body. The rest of them, I hoped, had high-tailed it for fresher water farther up the creek.

Novelist and outdoor writer Zane Grey once wrote that "To capture the fish is not all of the fishing. Yet there are circumstances which make this philosophy hard to accept." After several fruitless hours, I had reached that point.

Not only was the drum a good fish, but it had been well hooked in its bottom lip and I'd managed to tie a decent knot in 8-pound line that seems wispier and more difficult to see than it did 20 years ago. After a couple of quick photos, with the drum supported horizontally in my hands wet with creek water, I released the fish and it darted away, vanishing into the shallows. I don't recall what I was thinking, but I might have mentally patted myself on the back for having returned this fish to the creek in good shape.



A fish can be revived by moving it gently back and forth in the water. An angler should wet his hands before handling the fish to avoid damaging its mucous covering.

I might have been a bit hasty, for as anglers we never truly know whether a fish we release lives or dies. Odds are that fish was fine. It was exposed to air for less than a minute, and I put it back in the water to remove the hook. Why the pictures? When you're fishing with a professional photographer and he wants to record your catch, it's a no-brainer.

I rarely keep fish anymore. That's not a philosophical decision born of some politically correct—or corrected—view that fish should never be killed. If an angler wants to keep fish, let him keep them—as long as they are a legal catch and he intends to use them. (Killing fish such as tarpon and false albacore, which have minimal or no table value, does seem pointless.)

My fondness for catch-and-release probably originated more from laziness than logic. If you don't kill a fish, you don't have to clean it. That seems the most clear-cut difference between hunting with a rod and reel and hunting with a gun. However, fishing with the intent of releasing every fish does change the role of fisherman as predator into fisherman as practitioner of a skill.

Still, I'd much rather catch fish than eat them. (I've not eaten a game animal that I don't like. I've never tried possum, but I'm assuming the flavor would be the four-legged equivalent of bowfin.)

ORIGINS OF AN IDEA

That aside, catch-and-release is a sensible, practical approach to having more fish available to catch. It emphasizes the recreational rather than the consumptive value of fish. Those notions were at the heart of the origins of catch-and-release. In the 1870s, anglers on the Penobscot River in Maine, faced with a declining population of Atlantic salmon, were encouraged to catch and then release

fish. Going back even further, catch-and-release has been practiced in England for some species for a couple of hundred years or more.

Early in the 20th century, Grey, who helped popularize big-game fishing and posed with quite a few very large, very dead marlin, tunas, sharks and tarpons, encouraged anglers to rethink, as he had, their attitudes toward fish and fishing. "I have gone through the game, over to the fair side," Grey wrote in "Tales of Fishes" in 1919. "[I]f we are to develop as anglers who believe in conservation and sportsmanship, we must consider the fish." Grey also asks, "Who fishes just to kill?" The idea of conserving fish was stated succinctly by another well known American angler, Lee Wulff, who in 1939 wrote: "Game fish are too valuable to be caught only once."

Where and when catch-and-release had its regulatory beginnings are difficult to ascertain. Some sources claim that in 1934 a section of Pennsylvania's Spring Creek was the first catch-and-release stream in the United States. But most sources credit Michigan in 1952 with the first application of catch-and-release regulations. Anglers on certain trout streams fished under a no-kill restriction and were limited to flies and artificial lures.

Catch-and-release came to North Carolina 54 years ago on Bradley Fork and the West Prong of the Little Pigeon River in the Great Smoky Mountains National Park. At the time, the concept was dubbed Fishing-for-Fun by fisheries biologist Albert Hazzard. After seven years of no-kill restrictions on those two streams, the U.S. Fish and Wildlife Service found that wild trout populations had increased threefold and the average angler catch was a little more than four fish per hour. Within a few years, federal and state agencies

employed the Hazzard Plan—Fishing-for-Fun—on streams in other states.

Although catch-and-release regulations began in the United States with trout, it was largemouth bass that hooked great numbers of anglers on the idea of not killing fish. Ray Scott's Bass Anglers Sportsman Society (BASS), founded in 1968, held its first catch-and-release tournament on Florida's Lake Kissimmee in 1972. Spurred in part by the organization's Don't Kill Your Catch program, bass anglers nationwide began emulating the fishing pros and took to releasing their own weekend catches. Today, few serious bass fishermen actually keep fish. BASS estimates that about 90 percent of its approximately 500,000 members are catch-and-release anglers.

The strength of the catch-and-release ethic among largemouth bass anglers is borne out in creel surveys conducted by the N.C. Wildlife Resources Commission. From July 1, 2005, to June 30, 2006, fishermen on the Roanoke River caught approximately 65,300 largemouths and released 98.2 percent of them. During the previous year, Tar-Pamlico anglers released 99 percent of the approximately 22,400 bass they caught.

The freshwater catch-and-release philosophy has spread to anglers who pursue just about any species of fish, whether red drum, blue catfish, striped bass or blue marlin. North Carolina's burgeoning recreational red drum fishery, in which an angler can keep only one slot-limit drum between 18 inches and 27 inches in length per day, is primarily catch-and-release. In 2006 fishermen harvested 52,383 red drum and released 463,565. Not since 1990 have more red drum been harvested than released. (The N.C. Division of Marine Fisheries figures 10-percent mortality for released red drum, which would add about another 46,000 fish to the total removals.)



Catch-and-release had its regulatory beginnings in North Carolina on trout streams in 1954 in the Great Smoky Mountains.

LITTLE MORTALITY, LOTS OF SURVIVAL

As it has spread, catch-and-release, which has long been a conservation ethic for anglers and a management tool for fisheries biologists, has evolved into a matter of conscience for some fishermen, who choose to kill no fish under any circumstances, even if the species is plentiful or removing some of them might benefit a particular piece of water.

Although anglers may practice catch-and-release for a variety of reasons, many fishermen release fish because doing so has become an inherent part of regulated fisheries. The concept is fairly simple: Fisheries managers trade a little mortality for a lot of survival.

"Anytime a length limit is implemented, some undersized fish must be released and a portion of them will die," said Kent Nelson, fisheries program manager for the Wildlife Commission. "The net benefit is that several year classes of fish are protected from harvest, which is especially important if the fisheries are sustained by natural reproduction, which includes all wild fish stocks in North Carolina. The degree to which that catch-and-release mortality is acceptable depends

on the management goals for the fishery, how significant that mortality is on a population level, as well as sociological variables."

During the striped bass harvest season on the Roanoke River, for example, the fishery operates with a two-fish daily creel limit. Minimum length for a keeper is 18 inches, and fish between 22 and 27 inches may not be possessed. The slot protects 5-to-8-year-old females, which typically will be of that length. Only one fish exceeding 27 inches may be included in the daily limit.

Hatchery-supported fisheries, such as stocked mountain trout and reservoir striped bass and hybrid bass, work a little differently. "Greater levels of harvest and mortality are tolerable there because these stocks do not depend on natural reproduction," Nelson said. "Regulations on these fisheries are more for distributing harvest among anglers, and in the case of reservoir striped bass fisheries, to allow some to survive to provide angling for larger, trophy fish. In all cases it is desirable to minimize the loss of released fish, so we have developed regulations and guidelines to help minimize mortality."

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“Game fish are too valuable to be caught only once.”

—Lee Wulff, 1939

The benefits of survival for wild fish are several. Fish continue to spawn, they prey on other fish, they become prey themselves and perhaps are caught again by anglers. Although most fish do survive release, there are situations when a significant percentage will not. In addition, there are sublethal or delayed effects, the scope of which biologists are still trying to determine.

The factors that lead to mortality of released fish are many and include water temperature, time played, time out of the water, handling, whether natural or artificial bait was used, water depth at hooking and hooking location. Those factors appear to be more critical to some species than to others. However, fishermen can minimize the adverse effects of many of these variables.

Probably no species has been examined more often in catch-and-release studies than striped bass, a fish whose population was depleted in the 1980s but was declared restored in 1997. It is a fish available to North Carolina anglers in a variety of waters, and it is governed by an assortment of regulations that often make catch-and-release mandatory.

Our striped bass fishery, whether in the ocean, rivers or impoundments, also involves a large voluntary catch-and-release component. These factors make *Morone saxatilis* an excellent example of issues involving the release of fish.

On the Atlantic coast, from the north-eastern United States to Cape Hatteras, stripers are a premier sport fish, attracting millions of saltwater anglers each year. Along the entire coast, anglers in 2006 landed almost 29 million striped bass and released alive about 91 percent of them, or 26 million. The Atlantic States Marine Fisheries Commission figures an annual release mortality rate of 8 percent for striped bass. For the East Coast, that additional mortality represents about another 2.1 million fish, close to the harvested number of 2.8 million. Yet, catch-and-release means that about 24 million striped bass were returned to the Atlantic.

In the popular Roanoke River striped bass fishery, open to harvest in March and April each year with a total allowable catch of 137,500 pounds, fishermen caught about 92,360 striped bass and released about 67,005 (72.5 percent) from July 1, 2005, to

Lures with single hooks, as opposed to those with treble hooks, generally reduce handling time of landed fish. The less time a fish spends out of water, the quicker its recovery.

June 30, 2006. The Wildlife Commission figures a release mortality of 6.4 percent, based on work done by Nelson with Roanoke River striped bass.

PROBLEMS WITH STRIPERS

Striped bass are especially vulnerable to stress from handling, particularly when water temperatures are warm. The warmer the water, the less dissolved oxygen it contains. The more a fish struggles against capture, the more it needs oxygen to recover. Too, when a fish such as a striped bass is out of water, it cannot breathe. The gill filaments (lamellae) collapse and stick together; carbon dioxide in the blood rises; oxygen decreases. A fish might appear to be in good shape, but die after release.

Nelson said the striped bass' difficulty with stress in warm water probably is related to the basic evolution of the fish, an anadromous species that spends much of its life in salt water. “Striped bass are a coolwater species; that’s what they are adapted to,” he said. “They’re not really a warmwater fish. They get stressed when the water is warm, compared to catfish and largemouth bass, which are geared toward warm water. In warm water, they have an inherent high mortality rate.

“What moderates the mortality in such places as the Albemarle Sound is the higher salinity of that water. In our reservoirs, at equal temperatures we’d see higher mortalities with striped bass.”

Other anadromous species in North Carolina, such as American shad, hickory shad, alewives and blueback herring, are also very susceptible to stress mortality. Nelson suspects the root of the problem may be the modifications the fish must make in their bodies to compensate for moving between

fresh water and salt water. (See Nature’s Ways, Oct. 2007.)

Numerous studies have shown that bait type and water temperature are the two primary factors in release mortality among striped bass, with water temperature probably being the more important. Bait type—artificial lures or natural baits—is related to hooking location. Fish tend to be hooked in the esophagus or gut more frequently with natural bait than with artificial lures. Those deep-hooking locations can produce injuries that cause death. Mortality with both types of baits increases when water temperature rises above 70 degrees.

In a 1995 study of Roanoke River striped bass, Nelson found an overall mortality rate of 6.4 percent for released fish that were caught with either artificial lures or natural baits. At the coolest water temperatures during the study (61 degrees), Nelson observed no mortality among stripers caught on artificial lures or natural bait, or the experimental “control” fish collected by electrofishing. When the water temperature rose to 74.3 degrees, mortality climbed to 13.3 percent for fish landed on artificials and for the control fish and 26.7 percent for those caught on natural bait. Most mortality (73 percent) occurred within the first 24 hours of capture.

The mortality odds increased nearly 30 percent for fish hooked in the esophagus, pharynx or gills compared to those hooked in the mouth or jaw. Among those fish caught on artificials, 96.2 percent were hooked in the mouth or jaw. Those caught on natural bait were hooked in the mouth or jaw 83 percent of the time.

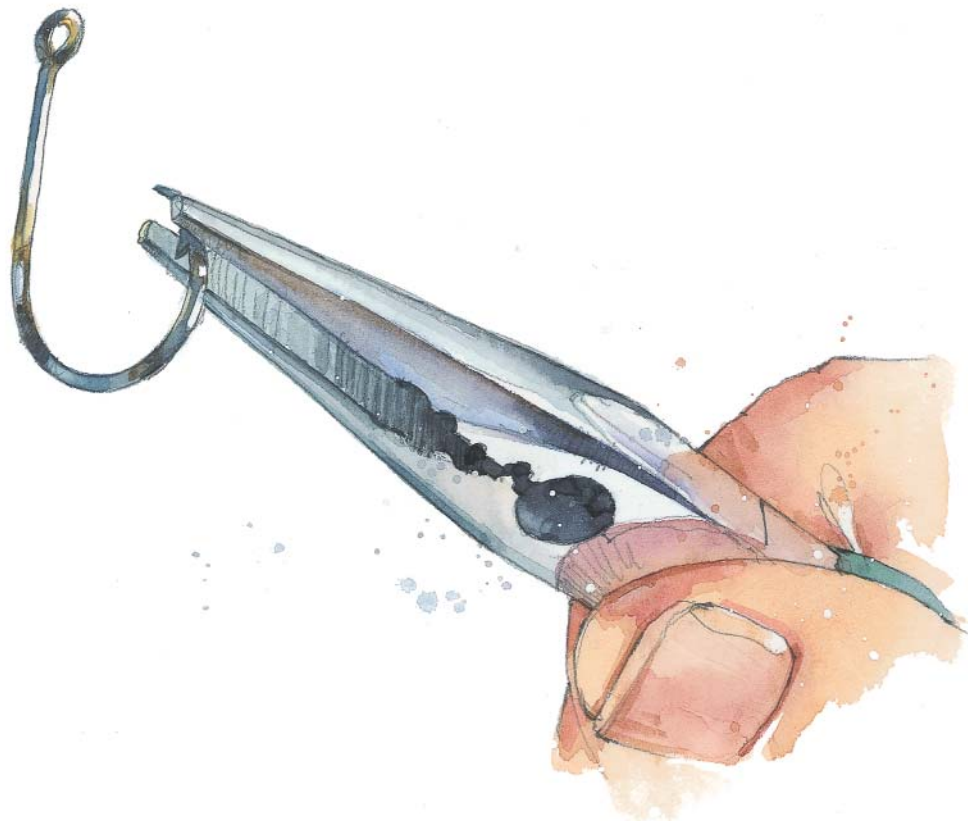
A later survey by biologist Gene Wilde examined the results of several major striped bass catch-and-release studies across the country. Of 1,275 freshwater stripers exam-

ined in these studies, Wilde found that mortality increased significantly when water temperatures rose above 61 degrees, climbing to 67 percent for fish caught with natural bait and 57 percent for fish caught with artificials at 88 degrees.

The increased mortality at higher water temperatures is why at such popular reservoirs as Kerr Lake and Lake Norman, the minimum size limit for striped bass (26 inches at Kerr, 16 at Norman) is eliminated from June 1 to Sept. 30, and in Kerr the daily creel is increased from two fish to four. The commission encourages anglers to fish for other species after landing four striped bass during those hot months.

The depth of some bodies of water—and Kerr Lake is an example—adds to catch-and-release considerations. In the main channels of that lake, the water may be as much as 100 feet deep or more. Fish caught and landed from depths of more than about 16 feet may suffer depressurization problems, including overinflation of the swim bladder and internal or external hemorrhaging. Species such as striped bass, largemouth bass, walleye and many panfish are more susceptible to these issues than are trout, chain pickerel or muskellunge, which can make pressure adjustments more quickly.

Although it is possible for an angler to deflate the swim bladder of a deep-caught fish with a needle, the Wildlife Commission does not recommend doing so. In the process, called fizzing or venting, it is too easy to puncture another organ, and even if the procedure is performed successfully, infection can set in at the puncture site. Because a boat bobbing on water is not a stable platform for working with a hypodermic needle or other sharp instrument, an angler also could easily injure himself.



Bending down a hook's barb also can reduce handling time. In some fisheries, such as the harvest season for Roanoke River striped bass, barbless hooks are mandatory.

CIRCULAR SOLUTIONS

Not only does bait type play a role in hooking location, so does hook type. Fish landed with J-hooks tend to be deep-hooked more often than those landed on non-offset circle hooks. Overall, circle hooks have been shown to be effective in comparison to J-hooks at reducing mortality. Biologists Steven Cooke and Cory Suski found in a review of circle hook literature (43 studies involving 25 species) that non-offset circle hooks reduced hooking mortality by about 50 percent, but the percentage varied among species.

Circle hooks are used almost exclusively in natural-bait fishing, but they are beginning to be used with some artificials, such as jigs and soft plastics. Some manufacturers also produce circle hooks with long shanks that are used by fly-tiers. Anglers can replace treble hooks on some lures with single circle hooks, but it can take some experimentation to get the correct-size hook. (It does not help that there is little standardization of sizes among circle hook manufacturers.) If an angler is concerned about quickly releasing a fish, a better option might be replacing the

trebles with a single J-hook with the barb crimped down.

From April 1 to June 30 on the Roanoke River, Wildlife Commission rules restrict anglers to a single barbless hook or a lure with a single barbless hook when fishing upstream of the U.S. 258 bridge. In addition, the commission also encourages anglers using live bait to use barbless non-offset circle hooks.

On the Roanoke, many anglers will fill their creel and continue to fish for stripers, practicing catch-and-release. Some estimates are that individual anglers catch and release 100 stripers or more per trip. Natural bait is used most often during this season, thus ensuring some release mortality, perhaps a significant amount. When the harvest season closes, usually at the end of April, anglers may continue to fish for striped bass under no-take restrictions. During May of 2006, the commission's creel survey showed that more than 24,700 stripers were caught and released on the river.

Nelson cited this catch-and-release fishery as an example of one that developed as a

result of new angling restrictions. The restoration of the striped bass from its low point in the 1980s to its current status is one of the best-known fisheries management success stories. The Roanoke River/Albemarle Sound striper population rebounded from a low of about 180,000 fish to approximately 2 million today.

"The catch-and-release fishery flourished on the Roanoke after harvest restrictions were implemented in 1991 to restore this dwindling anadromous population," Nelson said. "The end of the harvest season frequently occurred just as striped bass catch rates began to peak in the upper river. Quality catch-and-release fishing resulted.

"In this case the population has rebounded despite catch-and-release mortality, as well as significant levels of commercial discard mortality from gill net fisheries in the Albemarle Sound. In the case of the Roanoke River, catch-and-release and commercial discard mortality are estimated and included in the population model which helps determine acceptable levels of harvest."

For those many fish that survive catch-and-release there can be sublethal effects. The evidence, however, is inconsistent among different species. One study found a reduced growth rate among released

CATCH-AND-RELEASE BASICS

In order to make catch-and-release as streamlined as possible, follow these guidelines to increase survival rates for your catch:

- Use tackle strong enough to land fish quickly and reduce playing time. Fish played to exhaustion take longer to recover.
- If using live bait for large species such as striped bass or red drum, use barbless non-offset circle hooks.
- Use artificial lures to reduce deep hooking.
- The use of barbless hooks and single hooks instead of trebles makes dehooking easier and reduces handling time.
- Use one rod per angler. Fish caught on unattended lines have a greater chance of being deep-hooked.
- If legal, keep a fish that is bleeding heavily. Bleeding is a primary indicator of injury to the fish.
- Keep your fish in the water while unhooking it. Prolonged exposure to air is harmful to fish, particularly those that have been played to exhaustion. In one brook trout study, fish chased for 30 seconds to simulate angling and then exposed to air for 60 seconds or less did not experience any difficulty swimming. Air exposure of two minutes, however, resulted in about a 75 percent reduction in swimming performance, leaving the fish vulnerable to predation.
- If a landing net is necessary, use one made of knotless nylon or rubber. Knotted mesh nets can increase mortality (4 percent to 14 percent in one study) by damaging fins and removing the fish's protective mucous layer.
- If you must boat a fish, cover its eyes with a wet cloth to calm it. When handling, wet your hands or use wet cotton gloves.
- Use a dehooker, needle-nose pliers or forceps to remove the hook quickly.
- If a fish is hooked in the esophagus or gut, cut the line and leave the hook in place. Fish can expel the hook, sometimes in a short time. Avoid stainless steel hooks, which take much longer to corrode.
- A fish can be resuscitated in the water by moving it back and forth to force water over its gills.
- If a large fish is held for a photo, hold it horizontally to support the fish's body. Holding a big fish by the jaw can cause jaw or spinal injuries.
- Avoid catch-and-release fishing for striped bass when the water temperature is more than 70 degrees.
- Avoid catch-and-release in deep water.
- To speed the release process, know which fish are legal to keep.



smallmouth bass. Another detected no significant effects on growth among deep-hooked rainbow trout even when the hook was not removed from the gut. Several studies have found that released largemouth bass and smallmouth bass were less able to defend their broods when they were angled off the nest. Bass that were played to exhaustion took considerably longer to return to the nest than did briefly played fish, leaving nests open to predation.

The physical stress of being hooked, played, handled and dehooked causes a buildup of lactic acid (lactic acidosis) in a fish's muscles. Cardiac output also is increased. Depending upon the species, it might take a fish as long as 18 hours to overcome these effects. Fish also may incur injuries to gills, esophagus, eyes or jaw from hooks. While not lethal, these injuries may affect movement, reproduction or growth.

Obviously, catch-and-release is not as simple as unhooking a fish and blithely tossing it back into the water. Catch-and-release remains a blood sport, and that should not be forgotten. The benefits, however, can be numerous, such as catching one good fish on a difficult day. ♠

Jim Wilson is the associate editor of WINC.