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So You've Released Your Fish... BUT WILL IT LIVE?

Many knowledgeable fisheries biologists agree that catch and release fishing can be beneficial and may even be inevitable. Here are some facts that will help prevent the unintentional injuring or killing of fish destined to be released.

By Bob Knopf Contributing Editor

Nine pounds of glistening fury, the thick-bodied bass exploded through the water's surface. Flaring its gills, it wrenched and twisted in feverish attempts to escape its unseen enemy. Intermixing aerial acrobatics with desperate dives, spitting and coughing, twisting and thrashing, the bass stripped yards of line from the tiny reel that strained to contain its weight.

Five minutes... ten... fifteen minutes of frenzied battle were having their effect. The bass was nearly beaten. Its attempts at escape were weakening, but its enemy endured, relentlessly pulling it toward the surface. The bass' eyes no longer sparkled, but appeared cold and unthinking. What had once been breathtaking leaps, were no only muted wallowings and, finally, with its gills heaving and quivering from exhaustion, the bass was led silently to net.

Large and rounded with age, the bass was carefully unhooked, quickly admired and within a minute was gently released. It swam slowly to the depths, free once again. In five hours, however, it would be dead!

The triumphant angler is a modern, well-equipped fisherman who enjoys fishing and who releases many keeper fish. Aware of the excessive fishing pressure on many lakes and streams, he practices catch-and-release fishing.

Unfortunately, many catch-and-release fishermen, by the techniques they use and the ways they handle fish, are killing or injuring the very fish they choose to save. These unintentional killings can be largely prevented by properly handling a fish.

The jumping, thrashing, nine pound bass previously mentioned died from the aftereffects of over-exhaustion. In its intense and prolonged fight for freedom, the bass needed more oxygen than it could obtain, causing a chemical imbalance within its body. This chemical imbalance is the result of excessive lactic acid, which is a by-product of muscle activity.

During normal muscle activity, lactic acid, which forms in a fish's muscles, is removed by oxygen which the fish breathes in from the water. During setic acid builds up in a fish's muscles and is transferred into the blood. There is not enough oxygen to remove or "burn up" the excess lactic acid, which in large amounts is poisonous. Excessive lactic acid also causes a drop in the pH of the blood, which disrupts other physiological processes. A hooked fish, depending on how savagely it fights, will usually require from 2 to 24 hours to recover from the effects of its battle, or it may perish as our trophy bass did.

It is difficult to determine the percent of fish that die from this cause, but one study found that 71% of coho died within one to six hours after being caught.

Death by overexertion can be quite common, and would theoretically be more common in lakes that frequently have low oxygen. This problem would be most severe in midsummer, when warm water temperatures, active fish and low oxygen levels combine to magnify effects.

You or I cannot change how intensely a hooked fish struggles, but we can reduce the dangerous effects of overexertion by landing a fish more quickly, before it plays itself to complete exhaustion.

Ultra-light lines, although needed in some clear water lakes and streams, or when fish are extra spooky, should be avoided when possible. Modern fishing lines are more flexible, stronger and smaller in diameter than lines were only a few years ago. This lets us use stronger lines to make equally natural presentations. Stronger lines let us land fish more quickly, reducing the chance that a fish will overexert itself.

Another problem occurs when a fish is caught from deep water. Some fish (those with swim bladders) when brought quickly to the surface from an extreme depth, cannot adapt to the pressure changes and will often suffer internal damage resulting in injury or death. This is not always a problem when fish are caught from depths of 30 to 50 ft. or less, but if you fish at depths of 50 to 100 ft. or more it may mean that you will kill some of the fish you catch.

If we use stronger lines and play fish less we increase the fish's chance of survival ... until we get it to the boat. Once it's at the boat, what do we do with 10 lbs. of jumping bass or 45 lbs. (I'm the eternal optimist) of gyrating, evil-thinking musky? As beginning fishermen, we all learn that a boated, flopping musky or pike may indeed get revenge before thrashing itself to freedom or being succumbed by an oar-wielding, battle-scarred fisherman. One experience like this will get even the most intuitive fisherman thinking about what he is going to do with his now defeated, but contemptuous-looking quarry.

Whether it is best to land a fish by hand or use a net is determined by the fish's size. Large elongated fish, especially muskie, pike and salmon, should be netted. This allows their entire body to be supported and helps prevent internal damage. Smaller fish, the kind I sometimes seem to catch all too readily, may be lifted by the line or grabbed with your hand. Bass are easily and safely lifted from the water by grasping their lower jaw. However, should you pick up a musky or pike this way, you'll learn a valuable lesson. I know I accidentally did it once and the fish almost put me on a stringer.

If you don't have a net, pick pike and muskie up behind the head in the 'neck' region from the top and support them near the mid-body region. Never pick them up by putting your fingers in their eye sockets (cringe!) or by putting your hand into their gills.

Walleye and other medium-sized, moderately toothy fish are best held with their body supported by your hand from behind the head.

Probably the best way to land a fish you wish to release is to not land it at all. Remove the hook (using pliers) while the fish is quietly lying alongside the boat.

Probably the overriding factor which determines the fate of any released fish is stress. Stress must be minimized. Holding a fish for two hours, even if it is kept in an oxygenated live well, may stress it enough to cause death. Larger fish are more easily stressed than smaller fish.

In studies I conduct, I surgically implant radio transmitters (beepers) into fish. This surgical procedure is quite stressful, even if properly done. I find I must start this operation within approximately 30 minutes of the time I catch the fish or else it may die. Simply confining the fish for one to two hours in a live well before the operation is too stressful to guarantee their survival. You should avoid any handling technique that causes a fish unnecessary stress. This includes swishing it back and forth in the water trying to revive it.

The longer you hold a fish, the more stressed it becomes. In fact, many factors which are of no concern if a fish is released immediately, become significant problems which must be dealt with if a fish is held for only a half hour or so.

One such problem, oxygen starvation, is one of the most common reasons for death of released or soon-to-be-released fish. This, in combination with stress from handling, may account for more than 90% of all fishing related mortalities.

When you catch a fish, unhook it, take a photograph if you wish, and quickly release it. If you are unsure that you wish to release it or if you need to keep it for observation (see insert titled "Signs That Indicate A Fish's Condition."), then place it in a live well that has sufficient space and circulating water, or an aerator. If you do not have a circulating live well, you will have to change the water in your live well every hour or so depending on how crowded it is. This is necessary whether you have an aerator or not.

Another reason fish must be kept in oxygenated water is that the retina of a fish's eye requires more oxygen than any other tissue in its body. A fish kept out of water or in an un-oxygenated live well for only a "couple minutes" may suffer permanent eye damage and may be blind.

If you don't have a live well, you can use an ice chest, or if you don't have either of these, then as a last resort, put the fish on a stringer. Stringers are definitely better than letting the fish flop about on the boat floor, but because they damage a fish's mouth they are a poor substitute for a live well. If you use a stringer pierce it through the fish's lower jaw skin and do not run it through the water as you move from spot to spot or troll a structure. If you'll be moving about, decide immediately whether you will keep or release the fish.

Temperature change is another problem facing a released fish. If you fill your live well near shore in the shallows or if there is a temperature gradient between surface waters (where circulating type wells take their water from) and the catch depth, then your captive fish can become temperature stressed to the point of death.

A fish's physiology is such that it can withstand a greater temperature change when going from warmer to colder water, than from colder to warmer water. However, they can only stand a few degrees temperature change in either direction. How much change they can take varies with each species of fish. When you catch a fish, you are normally taking it from deeper or shaded (weedy) waters that are cooler, and are placing it in warmer (surface) water. Temperature changes as little as 5 to 6 degrees Fahrenheit may

kill a fish outright. Combining a moderate temperature change (3 to 4 degrees) with low oxygen or some other stress-producing factor, can be enough to kill your catch.

During the spring, late fall and winter when waters are colder, fish may be held longer. Cold water slows fish metabolism causing them to use less oxygen. Also, cold water can hold more oxygen than warm water.

Because of these factors some fishermen put ice in their live wells to help keep their fish more healthy. This is okay if it makes the live well water temperature similar to the catch water temperature, but usually it is anything but beneficial to the fish. Fish that are caught in warm water and then placed in cold (iced) water become physiologically stressed, even though they usually appear perfectly healthy. Then, when you release them, they swim away and undergo a severe temperature change (from iced water to lake water) to die within a few hours. You don't see them die, but they are nonetheless just as dead!

Another serious problem is directly mishandling a fish. The slime (mucus) that coats a fish's skin helps protect it from infection by dirt and foreign particles, such as fungi. Handling a fish removes some of this slime, reducing the ability of the skin to prevent infections.

Mishandling often results in lesions and infections. Removing slime, from excessive handling, allows infectious organisms to invade the fish's skin.

It is usually best to wet your hands before handling a fish, but don't grip the fish any tighter than you would with dry hands because this increases the risk of causing internal injury. Soft, wetted gloves may help prevent the fish from slipping and flopping about. Hard abrasive gloves remove too much slime and irritate the fish's skin.

There are a few other things that should not be done to a fish you plan to release. Never lay a fish on the boat floor or on the ground! Ever! Put it in a live well or hold it in your net (in the water), or have your fishing buddy hold it, even if you only need to put it somewhere for 10 seconds while you find your camera or long-nose pliers. (If you must lay a fish down, wet the surface you lay it on!) If I drop a fish and it flops around on the dirty ground or boat floor, I usually keep it (assuming it's legal) because of the chance for infection.

To measure a fish don't lay it on the boat floor; instead mount a rule on the gunwale of your boat or on top of your tackle box and hold the fish alongside.

Another reason not to lay a fish on the ground is that fish don't have eyelids and their eyes are susceptible to abrasion by dirt and sand. If dirt gets on a fish's eye there is an excellent chance that an infection will develop or that a fungus will attack the eye's tissues, permanently blinding it.

Another precaution you can take is to protect or shield a fish's eyes from direct sunlight. Light intensity is greatly reduced when only an inch or so of water covers a fish. Although the physiological effects of direct sunlight on a fish's sight is undocumented, I feel that it may be serious enough to warrant some concern. Until we know for sure, shield a fish's eyes from sunlight as much as possible.

When a hungry bass explodes into your lure, it may attempt to swallow it on the spot. Commonly when this happens, the fish becomes hooked in the gills. Gill damage is another major cause of fish death. Unhooking deeply hooked fish is tricky and requires patience and needle-nose pliers. If the fish bleeds from the gills, you should observe it in a live well for awhile. If bleeding continues for more than a couple minutes, then keep it for your fry pan. However, conservation officers or fish wardens may not believe your honorable intentions should you keep a 20 inch musky or other illegal-sized fish. So, if you injure an illegal fish, you can only give it last rites and "bury" it at sea.

Jerking or yanking the hook from a deeply-hooked fish is a poor practice.

Hook holes in and about a fish's mouth are another consideration. The larger the hook you use, the more it will tear and the larger hole it will put in the fish's mouth. Use the smallest hook necessary to hold the quarry you seek.

Using pliers to unhook a fish will reduce damage to its mouth, throat and gills. It's a good idea to use them to unhook all fish, and as mentioned earlier, pliers permit easy unhooking of the fish before you bring it into the boat, greatly reducing the risk of injury.

When releasing a fish, gently lower it into the water. If the fish is weak or needs reviving, put it in your live well for observation. Swishing the fish through the water will not help revive it and the additional handling and stress do more harm than good.

Some fishermen believe that a fish released in the area where caught will swim and tell its friends that there is a dangerous foe lurking about, which will cause all the other fish in the area to develop “lockjaw.” This is scientifically unsupported. Your hooked and frenzied fighting fish can, by its activity, alert and scare other fish into inactivity, but it is doubtful that a released fish does much “talking.” More importantly, be concerned about what a hooked fish’s splashing and jumping do to other fish. Also, most fish have a home area just like you and I. These home areas provide shelter, cover, safety and a variety of foods ... the area where you choose to release the fish may not. It is best to release fish at the exact catch location.

Now that we have a good idea of how to (and how not to) handle the fish we wish to release, what size fish should we release? Is it best to release very small fish or only larger, trophy fish?

Let’s use bass as an example. Bass in the size range of 9 to 14 inches are usually common in most lakes and streams. However, this size bass, when spawning, does not have large amounts of eggs. (Bass smaller than approximately 9 inches aren’t yet of spawning size.) The number of eggs a fish lays is related to its body weight, more eggs come from heavier fish. Additionally, smaller bass (9 to 14 inches) often produce less offspring because they are often forced to less prime spawning areas by larger bass. Removal of these small fish often reduces competition allowing the remaining small fish to grow better. (Competition for food is often greatest when fish are smaller because they are more restricted in the size food they can eat.) Thus, bass in the 9 to 14 inch range are good candidates to keep because their removal is not quite as detrimental to the species, and in years when they are overabundant, keeping some may even be beneficial.

Larger bass, those 14 to 18 or 19 inches contain large numbers of viable eggs and produce more offspring than smaller bass. They frequently produce more offspring than extremely old (trophy) bass which usually produce more eggs, but whose eggs have lessened fertility.

Based on this it is best to release “middle-sized” (14 to 19 inch) bass and keep smaller and larger, trophy-sized bass. Although the sizes of spawning fish may change with different species (e.g. walleye, trout, etc.), most fish have a similar egg-production pattern. One, exception is that pike and muskie are not usually as successful spawners as bass, so most states have a 20 to 30 inch minimum size limit to guarantee that each fish spawns at least once before reaching a catchable size. Another exception is that most salmon spawn only once, meaning that many salmon you keep will not spawn.

Use the above as a guide, but when keeping any fish be sure to comply to your state’s length regulations. It is a complicated process to determine the size fish anglers can keep and because of this many states still have outdated and inefficient size regulations. “Modernized” regulations attempt to deal with increased fishing pressure.

This past September I went on vacation to several Rocky Mountain National Parks. The vacation was largely a sight-seeing and photography trip and I fished only occasionally. One of the places I fished was Yellowstone Lake in Yellowstone National Park. Yellowstone Lake has a trout length limit of 13 inches. All trout larger than 13 inches must be returned! I fished a couple hours from shore and caught five trout, none of which were legal; they were all too big (15 to 19 inches)! Was I disappointed? Certainly not. I’d rather catch and release 15 to 19 inch trout all day than fish all day to catch and keep one over 15 inches. The reason large fish may be readily caught in heavily fished Yellowstone Lake is because of the more modern (and effective) 13 inch maximum keeper size regulation.

A balanced fisheries resource is a valuable asset. As sport fishing continues to grow, and more and more anglers venture onto our lakes and streams, it will become increasingly important for each of us to release at least some of the fish we catch. But just as importantly, we need to save the fish we do release!