

Catching Fish from Deep Water - Barotrauma

One of the most common topics in online fishing chat groups for walleye focuses on if released fish caught from deep water survive. Improvements in fishing tackle and technology over time have allowed anglers to be more effective at locating and targeting fish in deeper water during all times of the year. The information below is provided to help you determine if barotrauma is likely to occur in fish under different fishing scenarios and to help you make informed decisions about where, when, and how to fish.

What is Barotrauma? Anglers often ask why a fish's stomach is sticking out its mouth after being caught in deep water. What is actually happening is the air in the gas bladder has expanded due to the lower pressure at the surface of the water, compared to the pressure where the fish was in the water column, and has pushed the fish's stomach into its mouth. A stomach sticking out of a fish's mouth is one of, and the most visible, symptom of barotrauma in fish. Barotrauma is defined as physical damage to body tissue caused from rapid decreases in pressure. This same phenomenon can affect humans, which is why divers need to control their ascent from deep water, depending on the depth and time spent at that depth.

Why does Barotrauma happen? When a fish is brought up from deep water, all the gasses in the fish's body expand, which can damage surrounding tissue by stretching or tearing them to make room for the larger volume of gas. This is most evident in and around the gas bladder. Many fish species, such as walleye, bass, and sunfish, do not have a physical outlet to the gas bladder, so pressure is regulated by gas diffusing through the bladder and into the blood stream through a valve, and eventually being released through the gills. Unfortunately, this is not a fast process and rapid pressure changes from being caught can expand the gasses beyond the capacity of the body cavity. Another process that happens during barotrauma, is the dissolved gasses in the body can come out of solution and turn into gas, like the diving condition called "the bends." These tiny gas bubbles can accumulate in the fish's eyes, blood, and internal organs. This is why some of the fish caught from deep water may have a bug-eyed look to them. Their eyes have expanded due to gas bubbles being released from fluid in and around their eyes. These gas bubbles also wreak havoc on the fragile gill membranes. Fish gills are effective at transporting dissolved oxygen from the water to the bloodstream and releasing dissolved carbon dioxide from the bloodstream, but any gas bubbles in the bloodstream damage the membranes making them less effective.

From what depth does barotrauma occur? There are a few factors that play into what depth fish can safely be caught at without major barotrauma effects. The time the fish has been at the depth or deeper and the physical anatomy of a species can influence the safe depth. However, a general rule of thumb is around 30 feet. Under 30 feet is generally considered safe, and over 30 feet is when barotrauma effects can start being present. Some fish species are better suited to handling larger depth changes with lower physiological effects. Lake Trout for example, have a pneumatic duct between the

gas bladder and their digestive tract, so they can release excess pressure before damage occurs. Northern pike and catfish also have the pneumatic duct, while walleye, bass and sunfish do not.

Is barotrauma lethal? The answer is that it can be, but it depends on many factors. Water temperature, depth where the fish was caught, time spent at the surface, etc. all play into the survival and mortality rates of fish caught from a depth of 30 feet or deeper.

If a fish swims away, will it survive? Not necessarily. Some studies have shown that even fish that swim down or away on their own can suffer from post release mortality. Conversely, some fish that float on the surface may be able to recover over time and swim down later. The deeper the water, the longer the fish is held out of water, and the higher the water temperature, the greater the probability of a fish dying after being released.

Is there anything anglers can do to increase survival of deep caught fish? There have been numerous attempts by anglers to help increase survival of fish caught from deep water. Some anglers have tried “fizzing”, which is using a needle poked through the fish’s side at a specific location to release the gas pressure from the gas bladder. This may help a fish swim back to the bottom but does not relieve any of the other physiological damage that happened from gas bladder expansion and gas bubbles forming in the blood stream. Additionally, the “fizzing” process inflicts additional tissue damage that can result in an infection and reduces a fish’s ability to maintain neutral buoyancy at depth until the hole in the gas bladder has healed. Some anglers try to reel in fish slowly to mitigate the pressure difference. This may be beneficial to species that can physically release the extra gasses but may not help those that can’t. The process of gas being diffused into the blood stream is a slow process, and anglers likely cannot reel a fish like walleye in slow enough to eliminate the barotrauma effects. Other creative anglers have rigged up baskets or hooks to send the fish down to the bottom and then release them at the depth they were caught. This may be helpful, in some cases, but there can still be tissue damage that occurred at the surface that could result in delayed mortality.

Do you have any advice for anglers considering fishing in deep water? Anglers should make a conscience effort to consider the potential fate of the fish they are releasing depending on depth. If all the fish caught that day are being kept for supper, there is no reason to stop fishing in deep water. If an angler already has their limit or are not keeping fish, they could choose to fish in shallower water to reduce the mortality of released fish. If many of the fish being caught are not the right size or species to be kept, anglers should consider fishing less than 30-feet deep to limit the amount of released fish mortality.