

These studies done in 2008 and recently published studies in depth how bass fared when held out of water (hypoxia) for extended periods of time, and the results are surprising.

The first was a lab test comparing largemouth to smallmouth. Bass were physically exercised to simulate angling and then held by the jaw ("thumbed" just like most every angler does) for a randomly chosen amount of time up to 10 minutes out of the water and exposed to the air. Afterward, fish were placed back into a holding tank and observed and tested for some chemical parameter monitoring, then ultimately placed back into a raceway for 24 hours to observe for delayed mortality. Water temps ranged between 18-23 deg. C. (64-73 F) in this test. Largemouth recovered faster than smallmouth, as expected, but there were no documented mortality cases after 24 hours in either species.

In the other study, largemouth bass were caught from a lake and then held out of the water for varying amounts of time that ranged from 0 up to 15 minutes. Tests were conducted during two specific environmental time frames, once at 15 deg. C. (59 F) water temps and again at 21 deg. C. (70 F). Bass were also tested for various bodily (chemical) parameters and were then placed in a holding tank for 30 minutes of recovery/observation. During this time they were fitted with an external transmitter and then released back into the lake and tracked for 5 days. Fish held out of the water longer took longer to recover, as well as longer to leave their release area in the lake, but again, no delayed mortality occurred for any of the fish including those held out of the water for the maximum 15 minutes.

We've always figured "bass aren't trout" and could be subjected to greater stressors (i.e., air exposure) and still come out OK. That bass could be held out of water for 10-15 minutes and returned relatively unharmed is testimony to this fact. That is a rather lengthy bit of time even for the most unpracticed of bass anglers. I was actually quite surprised at the result, but certainly love the practicality of the study. That said, keep in mind that all testing occurred at water temps at or under 75 degrees F., the temperature threshold that has long been thought to be the dividing line between 'safe' and 'unsafe' when it comes to fish care handling practices. Both studies warned of possible high(er) mortality if repeated in bass acclimated to these warmer water temps. So the "holding your breath" recommendation still remains good practical advice to follow, but a little extra time out of water, by itself, doesn't appear to make that much difference.

\* Alaina J. White, Jason F. Schreer, and Steven J. Cooke. 2008. Behavioral and physiological responses of the congeneric largemouth (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*) to various exercise and air exposure durations. *Fisheries Research*, Volume 89, Issue 1, January 2008, Pages 9-16

\* Lisa A. Thompson, Steven J. Cooke, Michael R. Donaldson, Kyle C. Hanson, Andrew Gingerich, Thomas Klefoth, and Robert Arlinghaus. 2008. Physiology, Behavior, and Survival of Angled and Air-Exposed Largemouth Bass. *North American Journal of Fisheries Management* 2008; 28: 1059-1068 doi: 10.1577/M07-079.1