Researchers find fishing tends to lessen population of best male bass

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Depiction of largemouth bass in its habitat. Micropterus salmoides. Credit: Timothy Knepp/Wikipedia.

(Phys.org)—A team of researchers from the University of Illinois has found that recreational fishing that employs the use of lures to catch

largemouth bass, results in a reduction in male bass that make the best fathers. In their paper published in the *Proceedings of the National Academy of Sciences*, the group writes that their research shows that male bass that tend to their young are more likely to be caught by hooks hidden in fish lures.

With largemouth bass, after the female lays her eggs, it's up to the male to protect them. They do so by fanning the eggs and driving away threats. Those that do a better job of it, tend to have more offspring survive. But, this new researcher suggests, the same aggressive behavior that some bass exhibit when protecting their young, can cause them to be more vulnerable to being caught by sport fishermen.

Because of the popularity of bass fishing, the fish are bred in reservoirs and are then released into the wild in places where fishermen go to catch them; otherwise all the fish would be caught and there would be none left to fish. Over time those that manage fish populations have come to realize that some bass are more likely to strike at a lure and thus be caught then others. Some fishermen prefer such fish, while others prefer those that are more difficult to catch. To serve the needs of both, both types of fish have been bred and are then released into different areas to account for the different tastes.

Suspecting that the two groups of fish might have other differences as well, the research team set up underwater cameras to watch the males as they cared for the eggs of their young in hatcheries. In so doing, they discovered that those fish that took their job very seriously, appeared to consider a lure a threat, and thus were more likely to attack it, resulting in them being caught. Conversely, those fish that were more lackadaisical in their responsibilities tended to be less likely to be caught.

The end result, the researchers say, is that the best fathers wind up being the ones that get caught, thus their young never hatch and grow up to

pass on their good father genes, which means that recreational fishing actually impacts the evolution of bass populations.

More information: Recreational fishing selectively captures individuals with the highest fitness potential, *PNAS*, Published online before print December 3, 2012, doi: 10.1073/pnas.1212536109

Abstract

Fisheries-induced evolution and its impact on the productivity of exploited fish stocks remains a highly contested research topic in applied fish evolution and fisheries science. Although many quantitative models assume that larger, more fecund fish are preferentially removed by fishing, there is no empirical evidence describing the relationship between vulnerability to capture and individual reproductive fitness in the wild. Using males from two lines of largemouth bass (Micropterus salmoides) selectively bred over three generations for either high (HV) or low (LV) vulnerability to angling as a model system, we show that the trait "vulnerability to angling" positively correlates with aggression, intensity of parental care, and reproductive fitness. The difference in reproductive fitness between HV and LV fish was particularly evident among larger males, which are also the preferred mating partners of females. Our study constitutes experimental evidence that recreational angling selectively captures individuals with the highest potential for reproductive fitness. Our study further suggests that selective removal of the fittest individuals likely occurs in many fisheries that target species engaged in parental care. As a result, depending on the ecological context, angling-induced selection may have negative consequences for recruitment within wild populations of largemouth bass and possibly other exploited species in which behavioral patterns that determine fitness, such as aggression or parental care, also affect their vulnerability to fishing gear.