

**Abstract:**

Catch-and-release associated mortality of largemouth bass (*Micropterus salmoides*; LMB) has received considerable attention due to the popularity of this fishery and the increasing prevalence of voluntary release by anglers. Most studies testing for the influences of catch-and-release fishing on LMB mortality and growth have been of short duration and conducted in artificial settings, which may or may not be representative of potential population-level responses observed in natural settings over longer time periods. We subjected Little Rock Lake South (8 ha), Vilas County, Wisconsin (closed to recreational angling) to an experimental five-year LMB catch-and-release fishery to test for effects on vulnerability to recapture, population abundance, size-structure, and growth. We fished Little Rock Lake South about once per week during May–September 2001–2005 with conventional angling gear and artificial lures. We also simulated or exceeded conditions typical of live-release tournaments by holding LMB after capture and later processing them for length, weight, and diet information. Catch-and-release mortality did not appear to negatively influence this LMB population as evidenced by the high number of recaptured individuals, increases in recruitment, and significant increase in density over time. We found no evidence of LMB being more difficult to recapture after being caught. Population size-structure decreased over time. Average body condition did not change over time; however, size-specific growth rates increased. The observed increase in growth rates, despite a significant increase in density, was likely associated with high prey availability. This increase may not be representative of growth effects observed over longer time scales should LMB density continue to increase. Our results suggest that catch-and-release fishing had minimal negative effects on the sustainability of an LMB population if greater abundances are desired. However, density-dependent compensatory responses in size-structure and growth may be expected over time.

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