

# Seasonal Tournament Mortality of Black Bass in Kansas Reservoirs

Kansas Department of Wildlife and Parks  
Michael J. Hayden  
Secretary

Prepared by  
Randall D. Schultz<sup>\*1</sup>  
Fisheries Research  
Post Office Box 1525  
Emporia, Kansas 66801

Joe Kramer, Director  
Fisheries and Wildlife Division

Doug Nygren, Chief  
Fisheries Section



August 2003  
A contribution of Dingell-Johnson Funds  
Federal Aid Project No. F-30-R

---

\* Corresponding author: [randy.schultz@dnr.state.ia.us](mailto:randy.schultz@dnr.state.ia.us)

<sup>1</sup> Present address: Iowa Department of Natural Resources, 24570 U.S. Highway 34, Chariton, Iowa 50049.

Equal opportunity to participate in and benefit from programs described herein is available to all individuals without regard to their race, color, national origin or ancestry, religion, sex, age, sexual preference, mental or physical disability, or political affiliation. Complaints of discrimination should be sent to: Office of the Secretary, Kansas Department of Wildlife and Parks, 900 SW Jackson Street, Suite 502, Topeka, KS 66612

Abstract.—Eight seasonal fishing tournaments for black bass Micropterus spp. were evaluated to quantify weigh-in (initial), delayed, and total mortality in three large Kansas reservoirs during the years 1999 and 2001. Delayed mortality was determined by comparing mortality of control (electrofished black bass prior to the tournament) and tournament-caught black bass held in 1.2 m x 1.2 m x 2.4 m cages floated in the reservoir for 7 d. Total mortality averaged 10.1% (range 0 – 27.5%), 5.7% (range 0 – 8.9%), and 5.3% (range 4.6 -6.0%), for tournaments evaluated during spring, summer, and fall, respectively. Variability in mortality suggests tournament organizers and anglers should continue to strive for further improvements in survival of tournament-caught black bass, because high mortality rates can occur where tournaments are poorly organized and tournament anglers neglect black bass in their livewells. Still, this study provides information to non-tournament anglers showing that competitive anglers are doing their best to limit associated mortalities. This need is particularly critical to limit the contentious nature of competitive fishing, which is a legal, and can be an ethical use of the black bass resource in Kansas.

Tournament angling has become an increasingly popular use of fishery resources nationally (Kerr and Kamke 2003; Schramm et al. 1991a), and within Kansas (Stephen 1997). Relations between tournament anglers and non-competitive anglers are strained because of the perception tournament activities have on the fishery resource and fishing (Wilde et al. 1998; Guy et al. 1999). Moreover, considerable concern has been voiced that tournaments may harm fisheries by increasing and concentrating fishing effort, and increasing mortality. Mortality of tournament caught fish can result from a variety of sources, including hooking and fatigue (Wilde 1998), infections from handling (Steege et al. 1994), livewell water quality (Carmichael et al. 1984; Plumb et al. 1988), length of time and number and weight of fish in live wells (Wilde et al. 2002), tournament organizational procedures (Hartley and Moring 1995; Weathers and Newman 1997), or some combination of sublethal stressors (Kwak and Henry 1995). Initial tournament mortality rates have been reported to be as high as 61% with delayed mortality rates (i.e., deaths that occur after fish are released) reaching as high as 22% (Holbrook 1975). When weigh-in and delayed mortalities are combined, total mortality rates can be upwards of 80% (Holbrook 1975).

The number of Kansas black bass Micropterus spp. tournaments reported each year and the resulting tournament hours fished per angler has increased steadily since the Kansas Department of Wildlife and Parks began monitoring tournaments in 1977 (Stephen 1997). The greatest effect of tournament angling in Kansas may occur on western Kansas reservoirs. With the refilling of these reservoirs a resultant boom in bass populations (both numbers and size structure) has occurred, with an accompanying increase in the number of tournaments. Other studies have shown mortalities of large largemouth bass (total length > 457 mm) to be significantly greater than that of 305 – 356 mm largemouth bass (20% versus 9%, respectively;

Meals and Miranda 1994). Tournament activity may affect black bass population structure to a significant degree if the percentage of large fish in the population increases, tournament activity increases, or delayed mortality rates are high. These factors may be present in western Kansas reservoirs, and have the potential to alter black bass size structure and impair the ability of these reservoirs to produce trophy fish. Such a scenario can easily create public relations problems, and result in long-lasting antagonism toward tournaments and the agency responsible for protecting the fishery resource.

This study was conducted to quantify seasonal weigh-in (i.e., initial), delayed, and total mortality rates of tournament caught black basses during spring, summer, and fall in large Kansas reservoirs.

### Methods

Eight black bass tournaments were evaluated over the years 1999 and 2001. We attempted to assess seasonal black bass tournament-related mortalities at three reservoirs during spring, summer, and fall. However, most tournaments were evaluated on Cedar Bluff Reservoir because most weigh-in tournaments during these two years were conducted at this reservoir.

The day before each tournament control bass were electrofished throughout the lake. Largemouth bass Micropterus salmoides, smallmouth bass M. dolomieu, and spotted bass M. punctulatus were used as control fish because all three species were eligible for weigh-in. We attempted to collect control fish longer than the minimum length limit at the reservoirs (381 mm), but some sublegal fish were collected when sample sizes of control fish were small. Control fish were kept in Please Release Me<sup>TM</sup> electrolyte solution in the aerated boat livewell. They were then weighed (g), measured (tl), and tagged with Floy FD-68 t-bar anchor tags to individually identify each fish. Control black bass were distributed evenly into four, 1.2 m x 1.2

m x 2.4 m vinyl coated wire cages hinged to a floating, covered fishing pier. Ropes and pulleys attached to the cages and the pier frame facilitated daily inspection. The day of each tournament bass were randomly collected following the weigh-in activities. Tournament fish were weighed, measured, and tagged identically as the control fish, and distributed evenly in the cages. All data was recorded and physical anomalies present on individual fish were observed. The fall tournament was a two-day event and was considered two separate events. Control fish collected previous to the first day's tournament were also used for comparison to the second day's tournament. All control and experimental black bass were inspected at approximately the same time each day following placement in the cages. Weather conditions, water temperature, tag losses, and mortalities were observed and recorded. Initial mortality was defined as the total number of fish judged dead after weigh-in. Delayed mortality was determined by raising the cages every 24 hr and counting the number of dead fish. Total mortality was defined as the difference between the sum of initial and delayed mortality of tournament fish, and delayed mortality of control fish. Dead fish were removed from the cages each day and all fish were released after one week.

### Results and Discussion

Initial mortality rates were low for all seasons and tournaments, other than the first tournament evaluated (Table 1). Likewise, delayed mortality rates were low, a fact that may be most attributable to the care of bass while in the livewell and an attempt by tournament organizers to move the fish through the weigh-in process quickly. Discontent by nontournament anglers toward what is perceived as special treatment given to tournament anglers (regulation exemptions) or that tournament angling has an overall negative effect on the fishery has spurred tournament anglers and organizers into protecting the resource as much as possible. Numerous

publications (e.g., Gilliland 2001; Gilliland and Schramm 2002) and television coverage of tournaments have educated tournament anglers and organizers on the proper procedures for conducting live weigh-in events and the proper care of bass during tournament fishing.

Education programs have been recommended by other researchers as a means for reducing tournament mortality of black bass (Weathers and Newman 1997; Meals and Miranda 1994; Schramm et al. 1985), and may be having a positive effect.

Still, there is no evidence that initial, delayed, or total mortality has decreased since the mid-1980s (Wilde 1998). Major sources of black bass tournament mortalities are related to water temperature, and large tournaments; it is estimated that an average of 23% of tournament-caught black bass die after being released (Wilde 1998). Although only one of the tournaments evaluated in this study had mortality rates this high (Table 1), it is likely that high mortality rates in future tournaments will occur. High mortality rates may also be occurring in present tournaments that were simply not evaluated due to logistic constraints. All tournaments evaluated during this study had at most two tournament organizers moving bass through the weigh-in procedure. Numerous authors have shown higher rates of mortality associated with large tournaments and tournaments that were under-staffed (Gilliland 2003; Weathers and Newman 1997; Kwak and Henry 1995).

Black basses are the most sought tournament sportfish in the inland United States (Schramm et al. 1991a), and the most popular sportfish in Kansas (Burlingame 1997). In western Kansas much concern has arisen over dramatically increasing numbers of black bass tournaments where once few or none existed. Tournament critics argue the additional fishing pressure resulting from these competitive events is detrimental to black bass populations. Mortality of tournament caught fish can result from a variety of sources, including hooking, infections from

handling, fatigue, extreme air and water temperatures, poor livewell water quality, and length of time and number of fish in live wells (Schramm et al. 1991b). Additionally, the disruption of spawning activities and subsequent loss of reproductive potential of the population may have a detrimental effect on the quality of the fishery (Hayes et al. 1995). Finally, release of fish away from the point of capture may affect their distribution, potentially causing problems in the relative distribution of game fish and their prey, and detrimental effects on survival, growth, and reproduction related to relocation (Stang et al. 1996; Gilliland 1999). As an agency, KDWP has the option of reduced creel and/or more restrictive length limits to limit the effect of tournaments on a fishery. However, other mortality sources are just as detrimental to a fishery, but less obvious. This study shows the effects of latent mortality associated with eight seasonal competitive fishing events in Kansas is minimal. It is obvious that national media attention directed at tournaments has had an educational influence on tournament anglers and organizers, and has benefited the fishery resource. Additionally, this project provides an outlet to disseminate information to non-tournament anglers showing that competitive anglers are doing their best to limit associated mortalities. This need is particularly critical to limit the contentious nature of competitive fishing, which is a legal, and can be an ethical use of the black bass resource in Kansas.

## Acknowledgements

Lynn Davignon designed the methodology for evaluating tournaments at Cedar Bluff Reservoir during 1999, and this methodology was expanded to other reservoirs for 2001.

Appreciation is extended to the Kansas Bass Angler's Association, Jackpot Buddy, Trophy Team, Kansas Bass Federation, and the Garden City Outlaw Bass Clubs for allowing evaluations of their tournaments. I thank Tommie Berger, Lynn Davignon, John Reinke, and their crews for assistance with evaluating tournaments.

## References

- Burlingame, M.N. 1997. 1995 Kansas Licensed angler use and preference survey and attitudes towards angling by secondary education students. Master's thesis. Kansas State University, Manhattan.
- Carmichael, G.J., J.R. Tomasso, B.A. Simco, and K.B. Davis. 1984. Confinement and water quality-induced stress in largemouth bass. *Transactions of the American Fisheries Society* 113:767-777.
- Gilliland, E.R. 2003. Livewell operating procedures to reduce mortality of black bass during summer tournaments. Pages XXX-XXX in D.P. Philipp and M.S. Ridgway, editors. *Black Bass: Ecology, Conservation, and Management*. American Fisheries Society Symposium 31, Bethesda, Maryland.
- Gilliland, E. 2001. A prescription for survival. *Bassmaster Magazine* June 2001.
- Gilliland E.R. 1999. Dispersal of black bass following tournament release in an Oklahoma reservoir. *Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies* 53:144-149.
- Gilliland E., and H. Schramm. 2002. *Keeping bass alive: a guidebook for anglers and tournament organizers*. ESPN Productions, Inc./B.A.S.S. Montgomery, Alabama.
- Guy, C.S., M.N. Burlingame, T.D. Mosher, and D.D. Nygren. 1999. Exemption of bass tournaments from fishing regulations: an opinion survey. *North American Journal of Fisheries Management* 19:188-191.
- Hartley, R.A., and J.R. Moring. 1995. Differences in mortality between largemouth and smallmouth bass caught in tournaments. *North American Journal of Fisheries Management* 15:666-670.

- Hayes, D.B., W.W. Taylor, and H.L. Schramm, Jr. 1995. Predicting the biological impact of competitive fishing. *North American Journal of Fisheries Management* 15:457-472.
- Holbrook, J.A., II. 1975. Bass fishing tournaments. Pages 408-414 in R.H. Stroud and H. Clepper, editors. *Black bass biology and management*. Sport Fishing Institute, Washington, D.C.
- Kerr, S.J., and K.K. Kamke. 2003. Competitive fishing in freshwaters of North America: a survey of Canadian and U.S. jurisdictions. *Fisheries* 28(3):26-31.
- Kwak, T.J., and M.G. Henry. 1995. Largemouth bass mortality and related causal factors during live-release fishing tournaments on a large Minnesota lake. *North American Journal of Fisheries Management* 15:621-630.
- Meals, K.O., and L.E. Miranda. 1994. Size-related mortality of tournament-caught largemouth bass. *North American Journal of Fisheries Management* 14:460-463.
- Plumb, J.A., J.M. Grizzle, and W.A. Rogers. 1988. Survival of caught and released largemouth bass after containment in live wells. *North American Journal of Fisheries Management* 8:325-328.
- Schramm, H.L., Jr., P.J. Haydt, and N.A. Bruno. 1985. Survival of tournament-caught largemouth bass in two Florida lakes. *North American Journal of Fisheries Management* 5:606-611.
- Schramm, H.L., Jr., M.L. Armstrong, N.A. Funicelli, D.M. Green, D.P. Lee, R.E. Manns, Jr., B.D. Taubert, and S.J. Waters. 1991a. The status of competitive fishing in North America. *Fisheries* 16(3):4-12.
- Schramm, H.L., Jr., and nine co-authors. 1991b. Sociological, economic and biological aspects of competitive fishing. *Fisheries* 16(3):13-21.

- Stang, D.L., D.M. Green, R.M. Klindt, T.L. Chiotti, and W.W. Miller. 1996. Black bass movements after release from fishing tournaments in four New York waters. Pages 163-167 in L.E. Miranda and D.R. DeVries, editors. Multidimensional approaches to reservoir fisheries management. American Fisheries Society Symposium 16, Bethesda, Maryland.
- Steeger, T.M., J.M. Grizzle, K. Weathers, and M. Newman. 1994. Bacterial diseases and mortality of angler-caught largemouth bass released after tournaments on Walter F. George Reservoir, Alabama-Georgia. *North American Journal of Fisheries Management* 14:435-441.
- Stephen, J.L. 1997. Kansas black bass tournament monitoring: 1996 annual report. Kansas Department of Wildlife and Parks, F-30 2 and 3, Emporia.
- Weathers, K.C., and M.J. Newman. 1997. Effects of organizational procedures on mortality of largemouth bass during summer tournaments. *North American Journal of Fisheries Management* 17:131-135.
- Wilde, G.R. 1998. Tournament-associated mortality in black bass. *Fisheries* 23(10):12-22.
- Wilde, G.R., R.K. Riechers, and R.B. Ditton. 1998. Differences in attitudes, fishing motives, and demographic characteristics between tournament and nontournament black bass anglers in Texas. *North American Journal of Fisheries Management* 18:422-431.
- Wilde, G.R., C.E. Shavlik, and K.E. Pope. 2002. Initial mortality of black bass in B.A.S.S. fishing tournaments. *North American Journal of Fisheries Management* 22:950-954.

Table 1. Mortality of Kansas black bass following eight reservoir tournaments.

Reservoir	Date	Tournament fish				Control fish		Total mortality
		Number weighed	Number held	Initial mortality	Delayed mortality	Number held	Delayed mortality	
<b>Spring</b>								
Cedar Bluff	5/22/99	159	53	5	14	50	1	27.5%
Milford	6/7/01	53	53	0	1	23	0	1.9%
Cedar Bluff	6/16/01	163	53	5	4	15	3	3%
Total		375	159	10 (2.7%)	19 (11.9%)	88	4 (4.5%)	10.1%
<b>Summer</b>								
Cedar Bluff	7/17/99	215	54	7	3	50	0	8.9%
Wilson	7/15/01	16	15	1	0	7	0	6.3%
Cedar Bluff	8/17/01	172	45	0	3	10	1	0%
Total		403	114	8 (2.0%)	1 (1.5%)	67	1 (1.5%)	5.7%
<b>Fall</b>								
Cedar Bluff	9/25/99	35	27	1	1	50	1	4.6%
Cedar Bluff	9/26/99	33	25	0	2	50	1	6.0%
Total		68	52	1 (1.5%)	3 (5.8%)	50	1 (2.0%)	5.3%