

Largemouth Bass Creel Results for Tournament and Non-tournament Anglers, Lake Kissimmee, Florida

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Abstract: The Lake Kissimmee roving creel survey, ongoing since 1974, was an excellent mechanism for determining annual harvest, effort, and success of tournament and non-tournament anglers fishing for largemouth bass (*Micropterus salmoides*). On an annual basis, tournament anglers accounted for 34% to 37% of the total annual catch, which included released fish. Tournament bass fishermen exerted an estimated annual effort of 83,327, 66,639 and 74,077 man-hours in 1989, 1990, and 1991, respectively. Total success estimates for bass were significantly higher for tournament anglers than for non-tournament anglers during the study period.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 46:307-313

Organized competitive sportfishing has been a growing use of fishery resources for the last 20 years (Schramm et al. 1991). Schramm et al. (1991) defined competi-

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tive fishing as "organized events in which a group of anglers fish for inducements—awards, prizes, or public recognition—in addition to the catch or the satisfaction of catching fish." Data collected from bass clubs and large tournament organizers have been evaluated in several states including Arizona (Silvey et al. 1988), Florida (Chapman 1977, Chapman and Fish 1983), Kansas (Willis and Gablehorse 1983), North Carolina (Van Horn and Birchfield 1981), Tennessee (Cheek and Pollock 1989), and Texas (Seidensticker 1974, Durocher 1982, Whitworth 1986, Twedt and Whitworth 1991). Information collected was used to determine harvest and success rates of tournament anglers fishing state waters, and to identify areas that received the highest tournament pressure.

Schupp (1979) surveyed all 50 states and determined there were 12,369 bass tournaments held during 1978 (49 of 50 states responding). Duttweiler (1985) again surveyed all 50 states and found only 7,419 bass tournaments were held during 1983 (46 of 50 states responding). Schramm et al. (1991) received surveys from 44 states and estimated 13,926 bass tournaments were held during 1989, representing 82% of all inland competitive fishing events. Duttweiler (1985) estimated bass tournaments outnumbered competitive fishing events for all other species by 10 to 1, but Schramm et al. (1991) reported that events for species other than bass were increasing.

The increase in tournament popularity has forced biologists to recognize several potential problems, both biological in nature and those based on public perception. Concerns of fishery managers about effects of fishing contests can be broken down into 3 basic areas: biological impacts, economic or commercial impacts, and social or user group impacts (Riley 1985).

Florida Game and Fresh Water Fish Commission (FGFWFC) staff planned to identify intensively fished areas and to assess the need to regulate largemouth bass fishing contests (Chapman 1977). To assess tournament popularity, in 1975 Florida became one of the first states to implement a permitting procedure. Through permit data, it was determined that the Kissimmee Chain of Lakes was 1 of the 3 major tournament fishing areas in Florida (Chapman and Fish 1983). FGFWFC biologists documented no negative biological impact on the largemouth bass fishery, so requirements for tournament permitting and submission of tournament records was discontinued in 1982.

A year-round roving creel survey has been conducted on Lake Kissimmee since November 1974 to describe angler harvest, effort, and success for largemouth bass, black crappie (*Pomoxis nigromaculatus*), and panfish (primarily bluegill, *Lepomis macrochirus*, and redear sunfish, *L. microlophus*). Annual angler effort estimates for largemouth bass ranged from a low of 49,155 man-hours during 1977 (an extreme low water year) to a period-of-record high estimate of 315,705 man-hours in 1989 (Moyer et al. 1991). During November 1988, the survey was modified to determine harvest, effort, and success estimates for largemouth bass caught by tournament and non-tournament anglers.

The purpose of this study was to compare tournament angler harvest, effort, and success with non-tournament anglers fishing Lake Kissimmee during the years 1989, 1990, and 1991.

We thank Chris S. Michael and Jon C. Buntz who assisted with creel surveys, Lawson E. Snyder, Scott B. Hardin, Phil G. Chapman, Wesley F. Porak, and Vince P. Williams who reviewed early drafts, and Anna C. Jasent who prepared this manuscript.

Methods

Lake Kissimmee, at 16,400 ha, is located in the upper Kissimmee River Basin near Lake Wales, Florida. Littoral areas constitute 46% (7,490 ha) of the total surface area of the lake at high pool stage, most of which is considered prime largemouth bass habitat. A randomly stratified roving creel survey utilizing non-uniform probability sampling was conducted from November 1988 through November 1991. All creel data were analyzed using a computed program designed by FGFWFC staff.

Since it was impossible to interview anglers throughout the entire lake in 1 day, the basin was divided into north and south sections. Each section was further divided into 2 smaller areas. Both sections were creeled at least twice (1 weekend day and 1 week day) during each 2-week period for all 3 years. The survey was conducted either in the morning (from sunrise to midday), or in the afternoon (midday to sunset). The 2 areas within each section were surveyed for approximately 3 hours each. This technique enabled the creel clerk to adequately survey each section within allotted time frames. The instantaneous count time was randomly completed during the first, second, or third hour within each area, and the remaining time was spent interviewing fishermen. Interview questions included length of time fished, number of fish caught, number of bass released, and whether the angler was tournament/pre-tournament (tournament) or non-tournament fishing. (We combined tournament and pre-tournament angler creel information in this report). No distinction was made between tournament anglers fishing small (club) or large tournaments. The term "estimated total catch" includes fish harvested, as well as those released by all groups of anglers.

Data were entered into a computer for analysis and statistical evaluation using SYSTAT 4.1. The Student's *t*-test (2-tailed test) was used to compare success rates for tournament anglers to the success rates for non-tournament anglers. Statistically significant differences were identified at the 95% level of confidence ($P \leq 0.05$).

Results and Discussion

Tournament anglers accounted for 34% to 37% of the estimated total annual catch during the study period. Although largemouth bass were recorded as harvested by tournament anglers, the majority of these fish were presumably released alive following weigh-in. Total mortality estimates for largemouth bass caught during tournaments in 2 Florida lakes during 1972–1984 ranged from 1% to 61% (Schramm and Haydt 1987). No estimates of mortality were made during our study. Tournament anglers caught an estimated 37,481 bass during 1989, 31,617 during 1990, and

40,828 during 1991. Since tournament weigh-ins may have been held on other connected lakes within the basin, some fish were likely released into other waters. The impact to Lake Kissimmee, even though these fish were live released in other areas, was the same as if the fish had been harvested. Riley (1985) stated that if every bass weighed in during a tournament was kept, which is the licensed angler's right, there would be a negligible change in total harvest. During this study, however, creel estimates indicated that if tournament anglers on Lake Kissimmee did not release bass following weigh-ins, actual harvest would have increased by 48% to 57%.

Yearly angling effort directed toward largemouth bass on Lake Kissimmee during the 3-year study ranged from 273,576 man-hours in 1991 to 317,132 man-hours in 1989 (Moyer et al. 1991). Effort expended by tournament anglers ranged from 66,639 to 83,327 man-hours (Table 1). These estimates represented 23% to 27% of the annual effort directed toward largemouth bass and differed significantly from that reported for Texas where annual statewide fishing pressure estimates for bass clubs made up <2% of the statewide directed effort toward largemouth bass from 1978–85 (Dolman 1991). Effort estimates for major tournaments on Lake Kissimmee between 1975 and 1982 averaged nearly 13,000 man-hours per year (Chapman and Fish 1983). The increase observed in this study may be partially due to the fact that effort estimates were generated using data from all tournament anglers, regardless of the size of the tournament. This suggests that failure to include anglers fishing smaller "club" tournaments could create significant bias when developing statistics related to "tournament anglers."

Tournament angling pressure was lowest during the winter quarter and highest during fall and summer quarters (Table 2). Data indicated that tournament anglers represented 45% to 48% of the angling effort during the fall quarters. Non-tournament anglers, on the other hand, expended most of their yearly effort during winter and spring quarters. The highest catch rates occurred in fall 1991. Tournament and non-tournament anglers caught 0.81 and 0.76 bass/hour, respectively.

Quarterly success rates were consistently higher for tournament anglers than for non-tournament anglers. Highest overall success rates typically occurred during the summer and fall quarters when effort estimates for tournament anglers were highest. Lowest overall success rates typically occurred in the winter/spring quarters when non-tournament angler effort was highest. The highest success rate for tournament anglers in 1989 occurred during the summer quarter with 0.62 bass/hour. In 1990 and 1991, tournament anglers had the highest success rate in the fall. During those same 3 time periods, non-tournament anglers had mean success rates of 0.34, 0.38, and 0.76 bass/hour, respectively. Although these differences reveal that tournament angler success rates were higher than non-tournament angler success rates, statistically significant differences were only identified when analyzing the entire 3 year data set.

This trend resulted in a greater difference in overall success rates between tournament anglers and non-tournament anglers than if effort had been equitably distributed by quarter. Bass fishermen total success estimates showed tournament anglers had significantly greater ($P \leq 0.05$) success rate than non-tournament anglers

Table 1. Tournament and non-tournament angler annual creel survey results for largemouth bass in Lake Kissimmee, Florida from 1989 through 1991.

	Tournament anglers			Non-tournament anglers		
	1989	1990	1991	1989	1990	1991
Harvested*	22,218	20,103	22,358	45,099	42,154	39,236
Released	15,263*	11,510*	18,469*	27,013	19,960	29,583
Total caught	37,481	31,617	40,828	72,114	62,115	68,819
Total hours fished	83,327	66,639	74,077	233,805	227,054	199,499
Harvest success estimate (bass/h)	0.27	0.30	0.30	0.19	0.19	0.20
Total caught success estimate (bass/h)	0.45	0.47	0.55	0.31	0.27	0.35
Percent total effort	26%	23%	27%	74%	77%	73%
Percent total catch	33%	32%	36%	67%	68%	64%

*Bass harvested by tournament anglers indicates subsequent release according to tournament rules.

*Released bass under minimum length determined by tournament organizers or culled due to over total daily limit.

Table 2. Tournament and non-tournament angler quarterly creel survey results for largemouth bass in Lake Kissimmee, Florida from 1989 through 1991.

	Tournament anglers			Non-tournament anglers		
	Total catch	Total hours fished	Total catch success (bass/h)	Total catch	Total hours fished	Total catch success (bass/h)
11/88-11/89						
Winter	4,660	14,137	0.33	27,316	79,709	0.34
Spring	6,082	19,396	0.31	18,094	73,655	0.25
Summer	13,638	21,888	0.62	17,287	50,278	0.34
Fall	13,101	27,906	0.47	9,417	30,163	0.31
11/89-11/90						
Winter	3,307	8,949	0.37	23,184	92,932	0.25
Spring	7,472	15,424	0.48	15,319	70,936	0.22
Summer	12,071	25,029	0.48	15,494	42,016	0.37
Fall	8,767	17,237	0.51	8,118	21,170	0.38
11/90-11/91						
Winter	3,864	10,024	0.39	24,364	91,705	0.27
Spring	8,247	20,004	0.41	11,461	51,078	0.22
Summer	5,182	15,124	0.34	8,299	24,401	0.34
Fall	23,535	28,925	0.81	24,695	32,315	0.76

during the study period. Mean success rates for the study period were 0.46 bass/hour for tournament anglers and 0.34 bass/hour for non-tournament anglers.

Annual differences in catch rates also reflected the increased success of tournament bass anglers, whose average catch rates were 0.45, 0.47, and 0.55 bass/hour for 1989, 1990, and 1991, respectively. Non-tournament angler success rates for the same 3 years were 0.31, 0.27, and 0.35 bass/hour, respectively. Quarterly variations in success, which affect the annual success rates, may reflect the seasonal variations in effort by tournament anglers.

Information gained from this study shows that tournament anglers can increase

harvest estimates and man-hours of directed effort toward largemouth bass. Tournament anglers consistently exerted nearly 25% of the total annual effort directed towards largemouth bass, and their total annual catch averaged 35% of all bass caught during the study. Fisheries managers need to consider bass tournament impacts on their systems if they desire to evaluate actual harvest. Additional steps may be necessary to better ensure bass survival following live release from tournaments. Two reports, "Live release of bass: A guide for anglers and tournament organizers" (Schramm and Heidinger 1988) and "Recycle your bass: A guide to handling and releasing your catch" (Chapman 1990), are excellent publications to familiarize tournament anglers and organizers with proper techniques for live release during tournaments.

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