Sociodemographic and Economic Characteristics of Black Bass Anglers Participating in Different Tournament Types on Lake Guntersville, Alabama

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Abstract: We described sociodemographics and expenditures of black bass (*Micropterus* spp.) anglers participating in eight different tournament types on Lake Guntersville, Alabama, in 2013. We estimated 9035 anglers fished in 259 tournaments. Most anglers were middle- to older-age Caucasian males with an annual household income of over US$75,000, and who had participated in tournaments for over 15 years. Travel distance, expenditures, non-Caucasian participants, residence location, number of times fishing on Lake Guntersville, entry fees, and club membership all differed among tournament types. Anglers spent $4.5 million (average of about $500 per tournament per angler) that generated $208,000 in state and local tax revenue over a one-year period. However, expenditures varied over an order of magnitude among different tournament types. Discrimination of unique tournament types was an important variable in understanding the complex sociodemographic and economic aspects of competitive black bass tournaments. This information can be used to promote local economic benefits of competitive fishing. For example, large open, semi-professional and professional tournaments, which attracted large proportions of out-of-state anglers and associated overnight trips, resulted in the greatest local economic impact, and should be the events local tourism bureaus and Chambers of Commerce focus on to attract tournaments to the area. Also, approaches to encourage minorities, younger anglers, and women to participate in tournaments could be pursued to increase participation, hence economic impact.

Key words: *Micropterus*, travel-cost method, travel expenditures, tax revenue

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Sport fishing tournaments are a popular recreational activity in freshwaters throughout the United States (Schramm et al. 1991a). Kerr and Kamke (2003) estimated at least 25,000 competitive fishing events were held in North America in 2000, while Schramm and Hunt (2007) projected that over 32,000 black bass (*Micropterus* spp.) tournaments occurred annually in the United States. Tournaments targeting black bass appear to be increasing, as Driscoll et al. (2012) reported 42,000 black bass tournaments occur annually in 14 southeastern states in the United States.

Expenditures made by tournament anglers constitute large economic inputs to the sport fishing industry. Wilde et al. (1998) examined differences between tournament and non-tournament black bass anglers and found that tournament participants were a specialized group, spending more money and days fishing than non-tournament anglers. Tournament anglers typically have higher expenditures than many non-competitive anglers due to larger tow-vehicles, boats and motors, and the use of more fuel, tackle, travel, and lodging (Schramm et al. 1991b). Many tournament events last multiple days and attract participants from outside the region or state, and can draw up to several thousand anglers per event. Thus, fishing tournaments can result in substantial expenditures and economic benefits in the local communities where these events are held. For example, direct expenditures by black bass tournament anglers were US$23.6 million over a one-year period on a large reservoir (45,000 ha) located in Texas (Driscoll and Myers 2013).

Although sociodemographics have been described for anglers in general, little information exists for black bass tournament anglers. Whereas, expenditures made by black bass anglers participating in tournaments have been reported (reviewed by Schramm et al. 1991b), little economic or sociodemographic data have been reported for different types of black bass tournaments (but see Dennis et al. 2006, Driscoll and Myers, 2013). Tournament types vary in organizational level, ranging from a few acquaintances getting together opportunistically, to fishing clubs that schedule regular tournaments primarily for members, to tournaments that are scheduled annually or semi-annually and are open to all anglers, and to semi-professional and professional tournaments that are usually part of a regular tour that holds events on various waterbodies. Likewise, anglers fishing these tournaments vary widely in dedication and expertise, with some fishing only local tournaments, some fishing only their club tournaments, and others par-

ticipating in one or more national tournaments, usually receiving financial or equipment support and having no other employment. Tournaments can range in size from less than 10 to over 1000 anglers. Tournaments are typically operated for profit, charity, or they divide monetary awards among winners, which can be quite substantial for larger semi-professional or professional tournaments (generally range from $5000 to $500,000). Nearly all tournaments have one common attribute; entry fees are required for participation.

The objectives of this paper were to describe sociodemographic attributes and estimate the economic value and tax revenue generated by anglers participating in eight different types of tournaments on Lake Guntersville, Alabama, over a one-year period. This 27,500-ha reservoir on the Tennessee River is a popular tournament destination located in northeast Alabama. Lake Guntersville is predominantly known for its excellent angling opportunities for largemouth bass (*M. salmoides*) and in the year prior to this study, had been ranked by Bassmaster Magazine as the third best black bass (herein termed bass) fishing lake in the country (Hall et al. 2012).

Methods

Tournament Types

Tournaments were separated into eight different tournament types based on a number of characteristics (Table 1). These included number of events annually, number of participants, travel distance, if anglers competing in tournaments received equipment or financial backing (semi-professional or professional), administration characteristics, entry fee costs, whether there was angler registration, organization membership, and if a set schedule existed. Some of these designations were based on the observations of McKee (2013) who conducted an onsite roving creel survey on Lake Guntersville in 2012 as well as our own observations.

These eight tournament types were classified as 1) wildcat, 2) regional club, 3) non-regional club, 4) trail/series, 5) small open, 6) large open, 7) semi-professional, and 8) professional, although these classifications somewhat overlapped (Table 1). In general, angler participation, entry fees, and organization level and affiliation organization level, and affiliation with a bass fishing organization increased with tournament size. Wildcat tournaments were the least organized of the tournaments surveyed, mostly occurred in the evening and night, and typically occurred among known acquaintances. Regional club (<160 km from the tournament site) and non-regional club (>160 km from the tournament site) tournaments had an organized administration and only club members and their guests could fish these tournaments. Trail/series tournaments were characterized as being part of a series that had a common theme or sponsor, anglers competed against each other over the course of a season (or trail) on a number of lakes, and were administered by a tournament director. Small open tournaments were single events that were normally held for charity or fund raising, had a tournament organizer, and some were part of a larger regional or national organization. Large open tournaments were one-time events, were well organized, attracted many participants, and all were associated with a larger organization. Semi-professional tournaments were affiliated with a national fishing organization; semi-professional anglers usually obtained some financial and sponsorship support, but participation also included non-professional anglers. The single professional event on Lake Guntersville was affiliated with a national fishing organization. All competing professional participants had sponsors and financial backing, but amateurs also fished in this tournament in the same boat as the professional anglers as co-anglers.

Some of these tournaments were "team tournaments" where both the boat angler and co-angler combined their catches and we did not discriminate between single angler and team tournaments. However, we did record if a returned survey was from a boat angler or a co-angler. We classified local anglers to be those residing in the three surrounding Alabama counties (Jackson, Madison, and Marshall) that border Lake Guntersville and these anglers resided within 81 km of the reservoir. Non-local anglers had residences that were greater than 81 km, which were not within the three

Table 1. Generalized characteristics of eight different tournament types classified from Lake Guntersville.

Tournament type	Publicized	Organization/ administration	Typical *n* anglers	Fixed schedule	Entry fee ($)	Professional anglers	Affiliated with an organization
Wildcat	No	Low/none	<15	No/Some	25–32	No	No
Regional club	No	Yes/president	<20	Yes	40–160	No	Some
Non-regional club	No	Yes/president	<20	Yes	20–120	No	Some
Trail/Series	Yes	Yes/director	>20	Yes	50–150	No	Some
Small open	Yes	Yes/director	<50	No	40–300	No	Some
Large open	Yes	Yes/director	>150	No	50–405	No	Yes
Semiprofessional	Yes	Yes/director	>150	No	100–1100	Some	Yes
Professional	Yes	Yes/director	352	No	1000/400	Yes/Amateurs	Yes

counties that border Lake Guntersville. Out-of-state anglers were those that resided outside of Alabama.

Sampling and Tournament Effort

Tournament anglers were surveyed between 1 February 2013 and 31 January 2014 (hereafter defined as 2013). Local merchants, tournament organizers, and fishing clubs were contacted to determine where tournaments were being held and when the weigh-in would take place. In addition, tournaments were identified from publicity (online and printed posters), advertising conducted by local merchants, and from visits to various boat ramps. Sampling was primarily conducted on weekends to identify tournaments and solicit survey responses. McKee (2013) estimated that approximately 90% of tournaments on Lake Guntersville occurred on Saturday and Sunday in 2012. We employed an opportunistic approach by conducting sampling trips to major boat-access points on three weekends per month during the peak tournament seasons of February–June and September–November to identify on-going tournaments that were previously identified by the methods described above. While sampling during this study, we discovered other on-going tournaments that we did not know about, as well as found that late evening and night weekday tournaments (i.e., "wildcat") occurred during summer. To survey these wildcat tournaments, we conducted weekday trips to intercept anglers participating in these events. In December and January, when there were fewer tournaments, two weekend days were randomly sampled each month at major boat ramps. With this approach, a full 12 months of tournament sampling was conducted.

Due to the frenzied nature of the weigh-in period with anglers weighing in, releasing fish, and loading and securing their boats/gear, a conventional full interview was impractical as we estimated this would take more than 20 min per angler. Therefore, prepaid postage mail surveys were randomly distributed with a unique identification number to both boat anglers (we assumed boat owner was the principal angler) and co-anglers (additional angler fishing in same boat with the boat owner) at the tournament weigh-in site after the tournament. Survey questions included sociodemographic characteristics of anglers, fishing habits, and specific trip expenditures (Table 2). Each survey packet directed anglers to complete the survey and return it in the envelope. On the survey, anglers were asked if they previously had completed a survey. Anglers who already completed a survey and refused to complete another survey were categorized as already surveyed. Once the tournament was completed, the tournament organizer was also interviewed to collect data including club, tournament name, the entry fee, and the total number of anglers, which included boat anglers and co-anglers.

An angler trip was defined as one angler travelling to Lake Guntersville to fish one tournament that lasted for 1 or 2 days. The total number of angler tournament trips over a one-year period was estimated from the average number of anglers fishing each tournament type multiplied by the estimated number of each type of tournament held that we detected during our survey. Our estimate of the total number of tournaments that occurred on Lake Guntersville during this study was conservative as this reservoir has over 30 boat ramps that could host a tournament.

Sociodemographic Analyses

A total of 16 sociodemographic characteristics of anglers competing in these eight different tournament types were tabulat-

Table 2. Description of sociodemographic variables surveyed and with analyses presented in Table 1.

Sociodemographic variable	Response
1) Age	Age of angler in years
2) Ethnicity	Caucasian, African American, Hispanic, Asian
3) Gender	Male, female
4) Lake resident	Yes, no
5) Household income (US$ x 1000)	<10, 10–20, 20–25, 25–30, 30–35, 35–40, 40–50, 50–75, 75–100, 100–200, >200
6) Bass club member	Member or not a member
7) Years of tournament experience	Number of years competing in tournaments
8) n practice days for this tournament	Number of days of practice prior to tournament
9) n tournaments fished in 2012 on Lake Guntersville	Number of tournaments fished in 2012 on Lake Guntersville
10) *n* days fishing on Lake Guntersville in 2012 not related to fishing a tournament	Number of days an angler spent fishing of Lake Guntersville that was not related to a tournament
11) Local angler or non-local angler	Residence <81 km or >81 from tournament site
12) Alabama resident	Yes, no
13) Alabama, Georgia, Tennessee resident	Yes, no
14) One-way distance traveled (km)	One-way driving distance to tournament site
15) *n* nights of lodging for this tournament	Number of nights an angler spent in paid lodging
16) Fish license purchased for this tournament	Yes, no

ed (Table 2). These characteristics included age, income, gender, ethnicity, residence location, lodging duration, travel distance, the number of years competing in tournaments, number of practice days fished, the number of days fishing on Lake Guntersville in 2012 for both tournament and non-tournament fishing, club membership, fishing license purchases, and variables related to travel to Lake Guntersville. Eight of these characteristics were categorical variables and reported as percentages (Table 2). Differences in percentages of these categorical variables among the eight tournament types was tested with goodness-of-fit tests using X^2 analysis (SAS Institute 2012). For each tournament type, individual angler responses for continuous variables (Table 2) were averaged and differences ($P \leq 0.05$) were detected using one-way analysis of variance for each response (SAS Institute 2012). Mean values were separated using the Student-Neumann-Keuls procedure. Correlation analyses were conducted to describe relationships between some of these sociodemographic variables. Finally, goodness-of-fit tests using X^2 analysis were conducted to determine if differences occurred in angler response rates, repeat survey submissions, or co-angler participation rate among tournament types. Total costs to participate in tournaments not including entry fees were compared between boat anglers and co-anglers using a *t*-test.

Travel Cost Expenditures and Tax Revenue

Tournament anglers who responded to the survey also provided travel cost and expenditure data that were summed to estimate the total money spent. These costs included all travel costs associated with the tournament they were competing in, including pre-tournament costs or practice before the tournament began. We assumed that returns from both boat anglers and co-anglers were returned that approximated the actual proportions that occurred among tournament types, but this may not have always been true. Boat angler and co-angler were noted in the analyses, but expenditure data were pooled for both angler types. In some instances, boat anglers and co-angler fished together as a team, but expenditures were summed for each individual angler. The following equation calculates travel cost and expenditures (TC_h) for an individual participant in a tournament:

$$1) \qquad TC_h = \sum_{n=1}^{10} (x_1 + x_2 + x_3 + \cdots x_{10})$$

where h represents an individual in a tournament, and x_n represents 10 independent cost variables that were summed and included vehicle fuel, boat fuel, lodging expense, groceries, meals, fishing tackle, boat launch fees, repair/maintenance fees, tournament entry fees, and license fees.

Because only a subsample of surveys was returned by anglers for each tournament, an expansion factor (EF) was computed to expand travel costs for all anglers competing in the tournament. The expansion factor (EF_j) for each tournament (j) surveyed was calculated as:

$$2) \qquad EF_j = \frac{P_T}{S_R}$$

where S_R represented the number of surveys returned and P_T was the total number of participants in the tournament.

Travel cost of each tournament (TC_j) was calculated using the equation:

$$3) \qquad TC_j = (\sum TC_h) \times EF_j$$

where EF_j represented the expansion factor for tournament j as defined in equation 2, and TC_h was as defined in equation 1. We assumed respondents had similar spending habits as non-respondents.

In addition to the EF_j that was used to expand travel cost data for an individual tournament, a weighting factor (WF) was computed to estimate total travel costs for each tournament type held on Lake Guntersville. Known-sampled tournaments (S_i) were tournaments that we knew were occurring on Lake Guntersville and were present to sample. Known-unsampled tournaments (N_i) were tournaments we knew were occurring, but were not sampled because of lack of manpower to cover all tournaments occurring on the reservoir. Unknown-sampled tournaments (U_i) were tournaments that we did not have knowledge of prior to sampling and were discovered and sampled while sampling other, known tournaments. Thus, these tournaments were included in our cost analyses by incorporating a WF using the following equation:

$$4) \qquad WF_i = \frac{(N_i + S_i + U_i) \times (U_i + S_{ALL})}{(S_i + U_i) \times (S_{ALL})}$$

where WF_i was the weighting factor of tournament type i; S_i, N_i, and U_i were as defined above, and S_{ALL} was the total number of known tournaments ($S_{ALL} = 48$) that were pre-planned to sample.

For example, we knew about and sampled seven regional club tournaments, but discovered another six of these types of tournaments which we sampled. In addition, we knew about, but did not sample another 17 regional club tournaments occurring on Lake Guntersville. Thus, we estimated 30 regional club tournaments occurred in 2013 (see Table 3), and the weighting factor (WF) used for estimating total cost for this example was:

$$WF = \frac{(17 + 7 + 6) \times (6 + 48)}{(7 + 6) \times 48} = 2.60$$

Total travel cost for each tournament type (TC_i) was calculated using the following equation:

$$5) \qquad TC_i = \sum (TC_j \times WF_i)$$

Table 3. Number (*n*) of tournaments sampled that only included returned surveys, estimated number tournaments, the average number of anglers per tournament (mean ± SE), average tournament duration (mean ± SE), average entry fee (mean ± SE), and average expenditures not including entry fees (mean ± SE) by tournament type.

Tournament type	Surveys distributed	Surveys returned (%)	*n* tournaments sampled	Estimated *n* tournaments	Average *n* anglers per tournament	Total *n* anglers	Average duration (days)	Average entry fee ($)	Average expenditures ($)
Wildcat	64	20	6	113	13 ± 2	1450	1	29 ± 1	58 ± 14
Regional club	115	31	11	30	13 ± 2	385	1.2 ± 0.1	65 ± 5	222 ± 27
Non-regional club	179	30	17	30	15 ± 1	450	1.2 ± 0.1	59 ± 4	493 ± 45
Trail/Series	181	26	13	45	21 ± 3	929	1	106 ± 6	331 ± 34
Small open	154	25	10	23	35 ± 10	803	1	108 ± 6	304 ± 56
Large open	511	24	5	7	373 ± 207	2614	1.4 ± 0.2	163 ± 4	501 ± 52
Semiprofessional	301	25	5	10	205 ± 22	2052	1.4 ± 0.2	174 ± 4	359 ± 33
Professional	167	31	1	1	352	352	2	1000 or 400	867 ± 97

where i represents each tournament type, TC_j was as defined in equation 3, and WF_i was the weighting factor to expand the cost estimate to all tournaments within type i as defined in equation 4. Again, we assumed that expenditures made by anglers fishing in known unsampled tournaments were similar to those of anglers we sampled for the same tournament type.

The overall travel cost (TC) for anglers across all eight tournament types was calculated using the equation:

$$6) \qquad TC = \sum_{i=1}^{8} TC_i$$

where TC_i was as defined in equation 5.

Total tournament expenditures were sorted by their location, city, county, and state. The tax rates used by the Alabama Department of Revenue (Fulford 2010) were then applied to these expenditures to determine fuel, lodging, and general sales tax revenues for two government levels including 1) those collected locally which included the cities of Guntersville and Scottsboro and Jackson, Madison and Marshall counties, and 2) those collected in the rest of the State of Alabama. Tax revenues from expenditures collected outside of Alabama were not calculated.

Results

Tournaments

We estimated 259 tournaments occurred in 2013 on Lake Guntersville that comprised 9035 participants (Table 3). Among these anglers, 68% competed in wildcat or in large open or semi-professional tournaments. Wildcat tournaments were the most common (44%) tournament (Table 3). A total of 1672 surveys was distributed and 26% ($n = 439$) were returned with usable responses from 68 tournaments. For these tournaments, the survey return rate ranged among tournament types from 20 to 31% (Table 3), but did not vary among types ($X^2 = 5.26$, df = 7, $P > 0.5$). Among all tournament types, 6.4% of the surveys returned were from the same angler fishing in another tournament. Anglers who repeated the submission of the survey composed 13%, 15%, and 17% of the small open, trail/series, and wildcat tournaments, respectively, which was higher compared to the other tournament types ($X^2 = 20.13$, df = 7, $P < 0.01$). Surveys included identification of either the boater or a co-angler and the percentage of co-anglers increased with our *a priori* gradient of tournaments; 14% to 15% of the regional club and wildcat tournaments anglers identified themselves as co-anglers and this rate increased to 39% to 53% for anglers fishing in semi-professional and professional tournaments ($X^2 = 15.91$, df = 7, $P < 0.05$). Overall, co-anglers composed 31% of all returned surveys.

Survey responses per tournament type ranged from 13 to 123. Of the 68 tournaments surveyed, 11 of these occurred over a 2-day period, the rest were 1-day events (Table 3). Large open, semi-professional, and professional tournaments tended to last more than one day. The average number of participants and entry fees generally increased along our *a priori* gradient of tournament types (Table 3).

Sociodemographic Characteristics

Among different tournament types, nearly all anglers were primarily comprised of middle-to-older age, Caucasian males, with average annual household incomes that ranged from about $87,000 to $107,000 (Table 4). These anglers on average fished in tournaments for over 15 years (Table 4). Age and income did not vary (F range = 0.63 and 1.07, df = 7, 395 and 425, $P > 0.3$) among these eight tournament types. Anglers age 45 and older composed 64% of all tournament participants, and 58% had annual household incomes over $75,000. Age was very weakly related to annual household income ($r = 0.13$, $P < 0.01$, $n = 403$). Males composed 99% of all participants and gender did not vary among tournament types ($X^2 = 4.52$, df = 7, $P = 0.7$). Of the 403 responses received for ethnicity, 96% of these participants were Caucasians, 3.7% were African Americans, and 0.7% were Hispanic and Asian. However, regional

Table 4. Mean sociodemographic characteristics of black bass anglers participating in eight different tournament types on Lake Guntersville, Alabama, in 2013. Significance levels (*P*) for one-way analysis of variance (ANOVA) and Chi-square analysis (X^2) testing for differences among tournament types is given. For ANOVA comparisons of continuous data, mean values in rows followed by the same letter were similar ($P > 0.05$).

	Tournament type								
Sociodemographic characteristics	**Wildcat**	**Regional club**	**Non-regional club**	**Trail/ Series**	**Small open**	**Large open**	**Semi-profess.**	**Profess.**	**ANOVA or X^2 (*P*)**
1) Age (years)	53	48	51	50	48	47	50	48	0.50
2) Ethnicity—Caucasian (%)	100	83	85	98	100	97	99	94	0.004
3) Gender—male (%)	100	100	100	98	100	99	100	100	0.72
4) Lake resident (%)	23	6	0	7	0	7	11	2	0.014
5) Household income (US$ x 1,000)	93	102	99	107	87	98	93	107	0.73
6) Bass club members (%)	54	86	100	52	36	43	36	54	<0.001
7) Years tournament experience	22	16	16	21	19	16	19	20	0.08
8) *n* practice days for this tournament	0.77^{c}	1.33^{bc}	1.43^{bc}	1.7^{bc}	1.51^{bc}	1.87^{bc}	2.39^{b}	3.52^{a}	<0.001
9) *n* tournaments fished in 2012 on Lake Guntersville	34.1^{a}	4.4^{c}	1.4^{c}	11.3^{b}	6^{bc}	4.9^{c}	7.9^{bc}	2.4^{c}	<0.001
10) *n* days fishing on Lake Guntersville in 2012 not related to fishing a tournament	61^{a}	9^{bc}	2^{c}	28^{b}	21^{bc}	21^{bc}	19^{bc}	9^{bc}	<0.001
11) Local anglers <81 km from tournament site (%)	100	47	0	36	28	28	29	8	<0.001
12) Alabama residence (%)	100^{e}	92	20	74	69	46	57	20	<0.001
13) Alabama, Georgia, Tennessee residence (%)	100	100	77	94	82	81	93	59	<0.001
14) One-way distanced traveled (km)	29^{d}	94^{cd}	321^{b}	133^{bcd}	230^{bc}	283^{bc}	161^{bcd}	621^{a}	<0.001
15) *n* nights of lodging for this tournament	0^{d}	0.58^{cd}	2.39^{b}	0.6^{cd}	1.59^{bc}	1.89^{b}	1.55^{bc}	4.75^{a}	<0.001
16) Fishing license purchase for this tournament (%)	23	14	78	32	39	59	57	84	<0.001

and non-regional clubs attracted greater (17% and 15%, respectively) ethnic diversity compared to the other tournament types ($X^2 = 26.7$, df = 7, $P < 0.001$), with more African Americans participating in these clubs (Table 4). Annual household income did not vary ($F = 0.36$, df = 3, 399, $P > 0.5$) among ethnic groups.

Membership in a bass club varied greatly among the eight tournament types ($X^2 = 82.54$, df = 7, $P < 0.001$) with the highest proportion of members found in both regional and non-regional clubs, as expected (Table 4). Not all participants in regional club tournaments were members of the club, but we suspect that many of these non-members were guests of members. Among the other six tournament types, the proportion of anglers belonging to a club/organization was similar and ranged from 36 to 54%. Across all tournament types, 49% of all participants belonged to a bass club. Most tournament anglers fishing on Lake Guntersville did not reside on the reservoir (Table 4), but a higher proportion of wildcat tournament anglers resided on the reservoir compared to anglers fishing in the other tournament types ($X^2 = 17.50$, df = 7, $P < 0.02$). Wildcat tournament participants were exclusively local anglers; whereas, less than half of the participants in the other seven tournament types were local ($X^2 = 72.14$, df = 7, $P < 0.001$; Table 4). For large open, semi-professional, and professional tournaments, 71% to 92% of the participants were non-local anglers.

Distance travelled to the tournament site and number of lodging nights generally increased with tournament size, organization, and entry fees (Table 4). Although the number of participants in non-regional club tournaments was small and entry fees were low, these anglers generally travelled distances and utilized lodging at rates similar to those fishing large open and semi-professional tournaments. Our analyses indicated anglers participating in trail/series were more likely to be local anglers or anglers living within the vicinity of the tournament site and used less lodging than the larger open, semi-professional or professional anglers (Table 4).

The number of tournaments an angler fished the previous year (2012) on Lake Guntersville varied more than 10-fold among tournament types, as anglers fishing wildcat and trail/series tournaments participated more in tournaments in 2012 compared to other tournament types; non-regional club and professional anglers fished the least number of tournaments on Lake Guntersville (Table 4). The number of days fishing on Lake Guntersville not related to competing in a tournament in 2012 varied 30-fold among tournament types and was highest for wildcat tournament anglers and lowest for non-regional club anglers. Differences in tournament participation in 2012 and days of non-tournament fishing were negatively related to distance travelled ($r = -0.57$ to -0.62, $P < 0.001$, $n = 434$–436). Not surprisingly, anglers living closer to Lake Guntersville fished at higher frequencies and fished more in tournaments than anglers who had to travel farther. The number of practice days for the tournament surveyed increased along our gradient of increasing tournament size, travel distance, organization, and entry fees (Table 4). Anglers who were Alabama residents were the dominant participants in wildcat and regional club tourna-

ments while only a small percentage of Alabama residents fished in non-regional club tournaments and the professional tournaments (Table 4). Most anglers fishing in tournaments on Lake Guntersville were residents of either Alabama, Georgia, or Tennessee (88%), but the professional tournament attracted the highest proportion of anglers living outside the tristate region (Table 4). Anglers in wildcat and regional tournaments were less likely to purchase an Alabama fishing license specifically for that tournament than were non-local regional and professional anglers (Table 4). Greater license purchases for tournaments were associated with anglers who did not reside in Alabama.

Expenditures and Tax Revenue

Anglers spent an average of $499 per tournament event in 2013, which totalled $4.51 million for all tournaments on Lake Guntersville. The largest proportion of these costs were spent on entry fees (27%), vehicle fuel (18%), boat fuel (15%), and lodging (16%; Table 5). As expected, the ratio of entry fees to total expenditures was lowest for non-regional club tournaments (0.10) and highest was for semi-professional (0.33) and the professional (0.45) tournaments. Interestingly, 28% of the costs incurred by wildcat anglers was for entry fees where these fees are entirely returned to the tournament winner. Anglers competing in large open, semi-professional, and professional events composed 56% of the total tournament effort on Lake Guntersville, but these anglers contributed 74% of the total expenditures spent. Conversely, anglers fishing in wildcat tournaments represented 16% of the fishing effort, but only contributed 3% to the total expenditures for all tournaments. Average individual expenditures not including entry fees was $365, but varied over an order of magnitude among the eight tournament types, with wildcat tournament and regional club anglers spending the least, and anglers competing in non-regional club, large open, and the professional tournaments spending the most (Table 1). As expected, expenditures (not including entry fees) were related to distance travelled to the tournament site; non-local anglers incurred greater costs to fish a tournament than local anglers ($r = 0.52$, $P < 0.001$, $n = 424$). Local anglers residing within the three-county area surrounding Lake Guntersville, non-local Alabama anglers, and out-of-state anglers averaged $377, $511, and $875 in total expenditures (including entry fees), respectively. Non-local and out-of-state anglers composed 70% of the total expenditures spent on Lake Guntersville fishing tournaments in 2013.

Anglers spent $130,000 purchasing Alabama freshwater fishing licenses specifically for competing in the tournaments surveyed (Table 5). Anglers competing in large open, semi-professional, and professional tournaments contributed 72% to the total license sales among the eight tournament types. Co-anglers who were either fishing competitively as an individual or on a team with the boat angler on average spent $86 less per total tournament costs (not including entry fee) than boat anglers ($t = 2.01$, df = 409, $P < 0.05$). Lower total expenditures of co-anglers compared to boat anglers was evident across all tournament types.

Within the State of Alabama, an estimated $208,000 of tax revenue was generated from tournament events on Lake Guntersville in 2013 (Figure 1). About 38% of this revenue was distributed to local cities and counties and the rest to the State of Alabama. Local government entities received 57%, 46%, and 9% of the lodging, general sales tax, and fuel tax revenues, respectively. The total taxable expenditures spent by anglers (not including entry fees and licenses) were $3.17 million, of which, 84% was spent in Alabama. For lodging, fuel, and general sales tax items (groceries, meals, tackle, launch fees, and boat repair), 95%, 78%, and 84%, respectively, occurred in Alabama.

Table 5. Total costs for 10 types of expenditures among eight tournament types occurring on Lake Guntersville. Participant proportions represent the percentages of total angler tournament events ($n = 9035$) from 1 February 2013 to 31 January 2014. Cost values are in US$ (x 1000). Total expenditures include all expenditures including entry fees.

Tournament type	Proportion of all anglers	Vehicle fuel	Boat fuel	Lodge	Grocery	Meals	Tackle	Launch	Repair	Licenses	Entry fee	Total expenditures
Wildcat	0.16	32.3	36.0	0	6.3	1.9	5.1	0	0	2.9	32.2	116.9
Regional club	0.04	24.0	26.2	8.8	6.2	3.7	10.2	1.6	3.2	1.7	25.6	111.2
Non-regional club	0.05	54.3	42.3	61.2	14.8	16.8	17.4	0.8	0.1	14.3	26.0	248.0
Trail/Series	0.10	66.6	78.4	67.0	16.9	18.8	28.2	11.6	10.8	9.5	77.1	384.9
Small open	0.09	70.0	65.4	38.1	21.5	22.7	16.3	0.5	1.3	8.0	81.8	325.6
Large open	0.29	316.2	218.7	323.5	121.3	96.7	118.5	4.3	68.5	42.9	370.0	1680.6
Semiprofessional	0.23	183.3	159.5	143.7	44.2	60.0	78.2	2.2	27.7	37.5	359.4	1095.7
Professional	0.04	59.2	51.3	79.1	29.4	29.4	35.5	0.1	8.3	12.8	246.4	551.5
Total	1.00	805.9	677.8	721.4	260.6	250.0	309.4	21.1	119.9	129.7	1218.5	4514.4
Proportion of total expenditures		0.18	0.15	0.16	0.06	0.06	0.07	<0.01	0.03	0.03	0.27	1.00

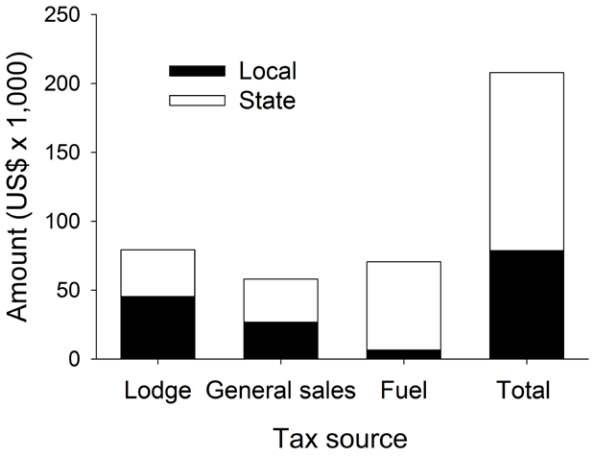

Figure 1. Local and state tax revenues generated from lodging, the general sales tax (meals, groceries, tackle, and boat repair), and vehicle and boat fuel for black bass tournaments held on Lake Guntersville in 2013.

Discussion

Many sociodemographic and economic characteristics were surprisingly similar among anglers participating in the eight different tournament types on Lake Guntersville in 2013. Age, household income, gender, and years fishing in tournaments did not vary among tournament types. Therefore, anglers participating in tournaments on Lake Guntersville were relatively homogenous, but angler residency, and thus travel distance, varied widely among tournament types.

Our response rate was relatively low (26%), but likely did not result in non-response bias enough to alter our results. The survey response rate of anglers was similar among the eight different tournament categories. Thus, if non-response bias existed, this was consistent across tournament types. Fisher (1996) discussed the importance of adjusting data results for non-respondents, but his approach requires some data from non-respondents such as age, gender, and race that were available from fishing licenses. Covariates are then used to estimate variables that were not directly measured from non-respondents (e.g., age is positively related to years of fishing experience). In our study, we did not obtain any data from non-respondents, thus could not use this recommended approach. Future surveys should include either on site or telephone queries to gather minimal information from non-respondents to utilize the approach of Fisher (1996).

The majority of tournament anglers fishing on Lake Guntersville were Caucasians (96%), but in Texas and throughout the United States, 86%–87% of all anglers have been Caucasian (Schuett et al. 2010, U.S. Fish and Wildlife Service and U.S. Census Bureau 2012). The lack of minority participation in competitive fishing tournaments was also observed by Hunt and Ditton (2002). Differences in socioeconomic status, early childhood and family exposure to power boating and types of fishing activities, and less interest by African Americans and Hispanics in environmental and conservation organizations likely explain in part the low minority participation in tournaments (Hunt and Ditton 2002, Floyd et al. 2006). However, slightly greater ethnic diversity was observed in club tournaments and we speculate that minorities may have felt more comfortable participating with known acquaintances in an organization where the same anglers compete on a regular basis. Greater interracial contact has been shown to influence minority involvement in leisure activities (Floyd and Shinew 1999).

Wilde et al. (1998) reported bass tournament anglers averaged 20 years of fishing experience and were 97% male. Similarly, on Lake Guntersville, average number of years fishing bass tournaments was 16 to 22 years and 99% of tournament anglers were male. Among all anglers who fish in Alabama, Georgia, and Tennessee, 63%–69% were male (U.S. Fish and Wildlife Service and U.S. Census Bureau 2012). Thus, tournaments on Lake Guntersville attracted a disproportionate number of males compared to the general angling public.

Tournament anglers on Lake Guntersville tended to be older (average 49 years old) compared to anglers fishing bass tournaments 20 years earlier in 1992 in Texas (average 38 years old; Wilde et al. 1998) and when compared to the angling and overall population. In freshwaters throughout the United States, 52% of the anglers were 45 years or older (U.S. Fish and Wildlife Service and U.S. Census Bureau 2012). In contrast, 64% of tournament anglers on Lake Guntersville were 45 years and older. Only 10% of the tournament anglers on Lake Guntersville were 32 years old or younger, suggesting an aging group of anglers and a lack of recruitment of younger tournament participants. Fishing club members composed 49% of tournament anglers in Lake Guntersville, which was higher than Wilde et al. (1998) documented for Texas tournament anglers fishing in 1992 (33%). Thus, bass club membership and participating in competitive tournaments were not strongly linked.

Median annual household income of anglers fishing in bass tournaments on Lake Guntersville was $87,500, which was about twice as high compared to the median annual household incomes of all residents in Alabama, Georgia, and Tennessee (www.deptofnumbers.com/income/). Only 22% to 35% of the population in this tristate region had annual household incomes >$75,000 compared to 50% of the anglers participating in tournaments on Lake Guntersville. Most bass tournament anglers possess large power boats (>5 m long, >100 horsepower) and large tow vehicles to travel to tournaments (personal observation). In addition,

given the travel costs to the tournament site, related expenses, and tournament entry fees, it is not surprising that competitive bass tournaments on Lake Guntersville were primarily fished by upper income participants. Schramm et al. (1991b) reported competitive angler expenditures are typically much greater than for non-competitive anglers. Non-tournament bass anglers spent an average of $183 per trip to Oklahoma reservoirs (Long and Melstrom 2016) compared to $365 and $700 (not including entry fees) on Lake Guntersville (our study) and Sam Rayburn Reservoir, Texas, respectively (Driscoll and Myers 2013).

Driscoll and Myers (2013) discriminated among three tournament types on Sam Rayburn Reservoir (Texas) and generally found similar results to ours; expenditures were lowest for anglers competing in small club tournaments, intermediate for open tournaments with lower entry fees, and highest for tournaments with higher entry fees. We found expenditures for anglers participating in club tournaments within the vicinity of Lake Guntersville were much less than anglers competing in non-regional club tournaments, mainly due to lower travel costs.

In Sam Rayburn Reservoir, Texas, 25% of all tournament angler expenses were for entry fees (Driscoll and Myers 2013) similar to the 27% spent by tournament anglers on Lake Guntersville. Entry fees, vehicle and boat fuel and lodging composed 71% of the expenses incurred by tournament anglers on Sam Rayburn Reservoir, Texas (Driscoll and Myers 2013), similar to the 73% spent by anglers on Lake Guntersville. On O.H. Ivie Reservoir in Texas, 57% of all tournament angler expenses were vehicle, boat, and lodging costs (Dennis et al. 2006) compared to 49% on Lake Guntersville. Average angler costs for fishing a club tournament event (including practice time) on Sam Rayburn Reservoir Texas, was $509 (Driscoll and Myers 2013) compared to $222 to $493 for clubs fishing tournaments on Lake Guntersville. Expenditures for open tournaments on Sam Rayburn Reservoir averaged $912 per angler (Driscoll and Myers 2013) compared to $501 on Lake Guntersville. Lower average tournament costs on Lake Guntersville may have been partially due to the high proportion of local anglers fishing tournaments on this reservoir. On Lake Guntersville, 30% of the total amount of expenditures spent on tournaments was by local anglers compared to 22% on Sam Rayburn Reservoir (Driscoll and Myers 2013). On Lake Fork, Texas, out-of-state anglers spent 10 times more to fish for largemouth bass than local anglers (Chen et al. 2003), similar to our results for anglers competing in tournaments on Lake Guntersville

Although the eight different tournament types on Lake Guntersville had variable levels of entry fees, organization, and participation size, anglers fishing those tournaments were a homogenous group consisting of upper income, middle-to-older aged Caucasian males. Club tournaments on Lake Guntersville, did, however, attract some minority participation. Different tournament types were primarily discriminated by residency and entry fees; those anglers who had to travel further had greater trip expenditures, often had to purchase fishing licenses, but typically fished less on the reservoir than anglers who resided nearby.

Wildcat tournaments were an interesting component of competitive fishing events on Lake Guntersville. Although only a small number of anglers fished these individual events, these tournaments accounted for 44% of all tournaments held and 16% of the total participation. Wildcat tournaments attracted competitive anglers to whom this activity appeared to be an important component of their leisure activity as these anglers fished on Lake Guntersville often. Because these tournaments typically occurred during weekdays and in the later afternoon, evening, and many instances lasted into night, we did not proportionally sample these anglers. Future investigations certainly need to account for these unadvertised "word of mouth" tournaments when assessing tournament characteristics, which seem to be common events on many water bodies particularly in the southeastern United States.

When examining economic impact of tournaments on a water body, different types of tournaments need to be discriminated because trip costs and expenditures can vary over an order of magnitude among participants. This information can be used to promote local economic benefits of competitive fishing. For example, large open, semi-professional and professional tournaments, which in our study attracted large numbers of out of state anglers and associated overnight trips, resulted in the greatest local economic impact and should be the events local tourism bureaus and Chambers of Commerce focus on to attract tournaments to the area. Bass fishing clubs that were >160 km from Lake Guntersville did not contribute much to local expenditures because these tournaments were small. However, this tournament type also had high trip expenditures and utilized overnight lodging and incentives to attract these non-regional clubs to fish on Lake Guntersville could be pursued. Approaches to encourage minorities, younger anglers, and woman to participate in tournaments should be pursued to increase participation, which would also increase economic impact. Finally, we occasionally found up to four tournaments causing crowding conditions at some boat ramps; additional or expanded access to the reservoir might be called for and could create conditions for increasing the number of offered tournaments.

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Literature Cited

Chen, R.J., K.M. Hunt, and R.B. Ditton. 2003. Estimating the economic impact of a trophy largemouth bass fishery: Issues and Applications. North American Journal of Fisheries Management 23:835–844.

Dennis J.A. et al. 2006. Annual expenditures of black bass tournament and non-tournament anglers on O.H. Ivie Reservoir, Texas. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 60:188–193.

Driscoll, M.D. and R.A. Myers. 2013. Black bass tournament characteristics and economic value at Sam Rayburn Reservoir, Texas. Journal of the Southeastern Association of Fish and Wildlife Agencies 1:26–32.

Driscoll, M.T., H.L. Schramm, Jr., and K.M. Hunt. 2012. Trends in fishery agency assessments of black bass tournaments in the southeastern United States. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 66:25–32.

Fisher, M.R. 1996. Estimating the effect of nonresponse bias on angler surveys. Transactions of the American Fisheries Society 125:18–126.

Floyd, M.F., L. Nicholas, I. Lee, J. Hyung-Lee, D. Scott. 2006. Social stratification in recreational fish participation: Research and policy implications. Leisure Sciences 28:351–368.

——— and K.J. Shinew. 1999. Convergence and divergence in leisure style among whites and African-Americans: Towards an interracial contract hypothesis. Journal of Leisure Research 31:359–384.

Fulford, K. 2010. A legislator's guide to Alabama's taxes, 2010 edition. Alabama Legislative Fiscal Office, Montgomery.

Hall, J., D.H. Jones, and K. Bitz. 2012. Bassmaster 100 best bass lakes. Bassmaster Magazine (May):68.

Hunt, K.M. and R.B. Ditton. 2002. Freshwater fishing participation patterns of racial and ethnic groups in Texas. North American Journal of Fisheries Management 22:52–65.

Kerr, S.J. and K.K. Kamke. 2003. Competitive fishing in freshwaters of North America. Fisheries 28(3):26–31.

Long, J.M. and R.T. Melstrom. 2016. Measuring the relationship between sportfishng trip expenditures and anglers' species preference. North American Journal of Fisheries Management 36:731–737.

McKee, C.E. 2013. Economic impact of recreational angler visitation to Lake Guntersville, Alabama. Thesis. Auburn University, Auburn, Alabama.

SAS Institute. 2012. SAS user's guide: statistics, version 9.4. SAS Institute, Inc. Cary, North Carolina.

Schramm, H.L., Jr., et al. 1991a. Sociological, economic, and biological aspects of competitive fishing. Fisheries 16(3):13–21.

———. 1991b. The status of competitive sport fishing in North America. Fisheries 16(3):4–12.

——— and K.M. Hunt. 2007. Issues, benefits, and problems associated with fishing tournaments in inland waters of the United States: a survey of fishery agency administrators. Fisheries 32:234–243.

Schuett, M.A., J. Lu, R.B. Ditton, and Y.P. Tseng. 2010. Sociodemographics, motivations, and behavior: The case of Texas anglers, 1989–2004. Human Dimensions of Wildlife 15:247–261.

U.S. Fish and Wildlife Service and U.S. Census Bureau. 2012. 2011 national survey of fishing, hunting, and wildlife associated recreation. U.S. Government Printing Office, Washington, D.C.

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.