

Blue Catfish Angler Survey in North-central Texas: Implications for Management

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Abstract: Management of blue catfish (*Ictalurus furcatus*) fisheries has recently increased in priority for many fisheries management agencies, but little is known about managing these fisheries. Also, while large-scale surveys (i.e., national and statewide) have provided managers with baseline sociological information, localized motivations and opinions of blue catfish anglers remain unknown in most areas. A mail-out survey was conducted to quantify motivations and opinions of blue catfish anglers in an eight-county area in north-central Texas to better manage local blue catfish fisheries. Surveyed anglers were generally harvest-oriented and preferred to harvest fish <610 mm total length. They supported the current harvest regulation (305-mm minimum length limit, 25 fish/day bag) or increasing the minimum length limit but did not support a reduced bag limit or a protected slot length limit. Results from this survey were used to guide blue catfish management in the region covered by the survey, including implementation of a new blue catfish harvest regulation in a local reservoir.

Key words: blue catfish, mail-out survey, reservoirs, harvest regulations

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Catfishes, particularly blue catfish (*Ictalurus furcatus*), are among the most popular sportfishes in Texas (Wilde and Ditton 1999, Anderson and Ditton 2004, Tseng et al. 2006). As such, there has been an increasing body of research focused on management of blue catfish populations in Texas waters (Buckmeier and Schlechte 2009, Hunt and Hutt 2010, Bodine et al. 2011). Most research has focused on refinement of sampling techniques. However, Texas Parks and Wildlife Department (TPWD) has given increased priority to understanding social components of catfish fisheries in Texas as part of a comprehensive statewide management plan (Hunt and Hutt 2010). Statewide opinion surveys typically provide a broad view of the state's licensed anglers and are a valuable tool for shaping policies and goals of fisheries management agencies (Hunt and Grado 2010). In contrast, species-specific and regional surveys have a narrower focus than statewide surveys and are directed toward anglers that use a specific resource (Hunt and Grado 2010). Data obtained from localized surveys allow fisheries managers to better understand specific user groups and develop management strategies accordingly (Hunt and Grado 2010). Additionally, obtaining user opinions when shaping localized management plans enhances credibility of the agency, builds public trust, and allows anglers to participate in management of local fisheries (Decker and Krueger 1999, Hunt and Grado 2010).

Hunt and Hutt (2010) recently administered a survey to characterize catfish anglers in Texas and examine broad-scale angler attitudes and opinions about catfish management. The survey (here-

after referred to as the statewide survey) was sent to Texas anglers who were previously defined as catfish anglers from a random survey of licensed anglers statewide. The statewide survey was developed to assist fisheries managers in Texas with development of management plans to promote and protect blue catfish fisheries. However, constituent motivations and opinions about catfish management in locally important catfish fisheries in north-central Texas remained unknown. Thus, the objective of this project was to obtain sociological data from blue catfish anglers in north-central Texas to assess angler motivations and opinions of blue catfish harvest and management scenarios. Results from this survey were useful in development of management plans for popular blue catfish fisheries in the study area.

Methods

A modified Total Design Method (Dillman 1978) was used to survey 1,000 randomly-selected fishing license holders who resided in an eight-county area in north-central Texas (Callahan, Eastland, Jones, Shackelford, Stephens, Taylor, Throckmorton, and Young counties; Figure 1). Surveys were sent on 4 January 2010 and included a cover letter describing the study, the survey instrument, and a postage-paid return envelope. A reminder postcard was sent on 11 January 2010 to all original survey recipients. The third mailing was sent on 1 February 2010 to all original survey recipients who had not yet responded and included a cover letter, the survey, and postage-paid return envelope. All surveys received

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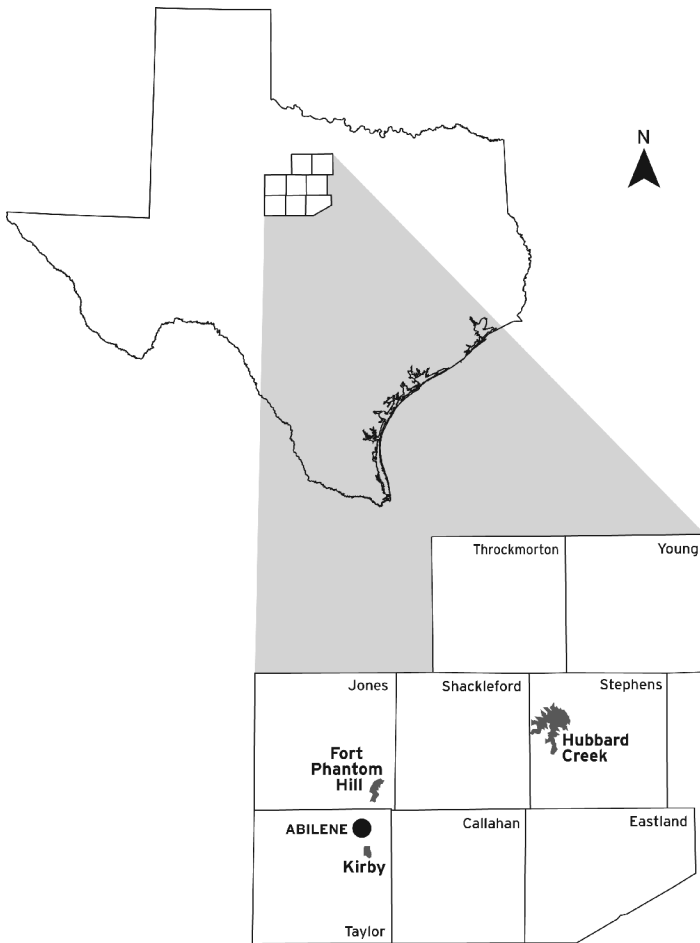


Figure 1. Map of north-central Texas where 1,000 fishing license holders were randomly selected to receive a survey about blue catfish angler behaviors, motivations, and opinions.

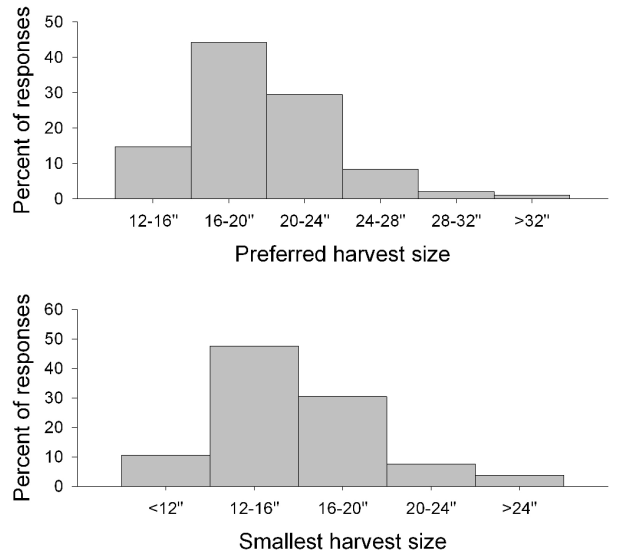


Figure 2. Blue catfish angler responses when asked what size blue catfish they preferred to harvest and what size was the smallest they would harvest.

by 1 April 2010 with at least one question answered were included in analyses. Responses from anglers who were identified as blue catfish anglers (i.e., anglers who indicated they had fished for blue catfish in the last year) were used for further analyses.

The survey consisted of 14 questions: two questions addressed harvest tendencies, seven questions asked about angler motivations, and five questions pertained to angler opinions of blue catfish harvest-management scenarios. Angler motivation and opinion responses were measured on a five-point Likert scale (Likert 1932). Proportions of both agreement responses (i.e., “agree” and “strongly agree”) and disagreement responses (i.e., “disagree” and “strongly disagree”) were pooled and chi-square tests were used to examine differences in proportion of angler responses to each question (SAS Institute 2008). Neutral responses were omitted from this analysis. Significance was determined at $\alpha \leq 0.05$ for all statistical tests.

Results

A total of 292 surveys with at least one question answered were returned (29.2% response rate), and of those, 132 respondents were considered blue catfish anglers. Most blue catfish anglers (74%) preferred to harvest blue catfish 406–610 mm total length (TL), but more than half indicated that they would harvest blue catfish below that size (Figure 2).

Although anglers preferred certain aspects of fishing for blue catfish, they did not necessarily require these aspects to be satisfied with a fishing trip. Respondents suggested that happiness increased as number of fish caught increased, but opinions were evenly split as to whether catching fish was necessary to consider an angling trip successful (Table 1). Respondents indicated they would prefer to catch fewer but larger fish rather than more smaller ones, but fishing somewhere with trophy potential was not important to them. Most anglers preferred to harvest legal-length blue catfish

Table 1. Survey questions used to measure blue catfish (BCF) angler motivations (M) and opinions (O). Likert responses range from 1 (strongly disagree) to 5 (strongly agree). Chi-square results compare proportion of disagree (Likert = 1 and 2) to proportion of agree (Likert = 4 and 5) responses. Neutral responses were omitted from chi-square analyses.

Type	Question	n	Likert Responses					Chi-square results
			1	2	3	4	5	
M	More BCF I catch, happier I am	128	5	3	24	53	43	$\chi^2 = 74.46, P < 0.001$
M	Not happy unless I harvest fish	129	12	28	45	35	9	$\chi^2 = 0.19, P = 0.663$
M	Usually harvest legal-length fish	129	9	19	21	47	33	$\chi^2 = 25.04, P < 0.001$
M	Not happy unless I catch some fish	129	11	28	45	35	10	$\chi^2 = 0.43, P = 0.513$
M	Rather catch a few big fish than lots of small fish	129	6	20	25	51	27	$\chi^2 = 26.0, P < 0.001$
M	Not happy unless there is trophy potential	129	25	60	32	10	2	$\chi^2 = 54.93, P < 0.001$
M	Just as happy to release most caught fish	129	8	21	24	45	31	$\chi^2 = 21.04, P < 0.001$
O	Keep current regulation	129	3	10	19	67	30	$\chi^2 = 64.15, P < 0.001$
O	Reduce daily creel limit	129	20	40	33	26	10	$\chi^2 = 6.00, P = 0.014$
O	Impose protected slot-length limit	129	30	32	39	20	8	$\chi^2 = 12.84, P < 0.001$
O	Restrict harvest of big fish	129	15	31	30	37	16	$\chi^2 = 0.49, P = 0.482$
O	Increase minimum length limit	127	14	23	30	37	23	$\chi^2 = 5.45, P = 0.020$

they caught, but also indicated that releasing most fish they caught did not affect their perception of trip success (Table 1).

Blue catfish anglers were generally opposed to regulation change when presented with alternative management scenarios. Anglers favored the current harvest regulation of 305-mm minimum length limit and 25-fish daily bag limit of channel catfish (*Ictalurus punctatus*) and blue catfish in aggregate (Table 1). Anglers opposed a reduction of the current daily bag limit or a protected-slot length limit. However, anglers were supportive of increasing the minimum length limit and were evenly divided on restricting harvest of fish over a certain length (Table 1).

Discussion

Blue catfish anglers surveyed in this study were mainly harvest-oriented, and nearly 45% of surveyed anglers preferred to harvest fish 406–508 mm TL. Other studies have found similar size-related harvest tendencies by catfish anglers (Holley et al. 2009, Hunt and Hutt 2010). An angler harvest-selectivity model from Lake Wilson, Alabama, suggested that probability of harvest decreased as blue catfish exceeded 457 mm TL (Holley et al. 2009). Similarly, anglers in the Texas statewide survey reported that they preferred to harvest blue catfish approximately 406 mm TL (Hunt and Hutt 2010). Mechanisms affecting harvest size preference were not examined in this study, but creel data suggest that fish >508 mm TL constitute a minority of angler-caught fish (Dumont 2008, Neely and Dumont 2010). Thus, anglers might prefer to harvest small fish (i.e., <508 mm TL) because larger fish are harder to catch (Holley et al. 2009).

Survey respondents provided information pertaining to blue catfish angling motivations that identified subtle differences be-

tween angler preferences and trip satisfaction. For example, most respondents stated a willingness to sacrifice numbers of harvested fish for the opportunity to catch bigger fish, but 88% did not need trophy opportunities to be satisfied with their angling experience. A similar number of respondents usually harvested legal-length blue catfish they caught, but stated that they would be just as happy if they released most fish they caught. As such, a diverse array of blue catfish angling opportunities would likely be best suited for the north-central Texas area. For example, blue catfish management goals might include trophy opportunities with limited harvest of large fish in one reservoir and development of a high-density population with increased harvest opportunities in another reservoir. Implementation of multiple management options at a regional scale (e.g., north-central Texas) could provide a variety of blue catfish angling opportunities and appeal to a greater number of constituents.

Angler acceptance of harvest regulations is important to achieve compliance and increase angler support of subsequent fisheries management plans (Decker and Krueger 1999). Based on angler responses in this survey, protected slot-length limits and restricted daily bag limits were not desirable management options to north-central Texas anglers. Protected slot-length limits are usually implemented when managers wish to increase harvest of small individuals in an effort to protect intermediate-sized fish and increase numbers of large individuals (Noble and Jones 1999). Because anglers in this survey did not consider themselves trophy anglers and preferred to harvest fish, it is unsurprising that they opposed a slot-length limit. Similarly, strong harvest motivations rendered decreasing the daily bag limit an unsuitable management option. However, anglers indicated they would support increasing

the minimum length limit. This support might be rooted in angler belief that increased minimum length limits increase abundance of larger fish. However, current biological and harvest data did not support regulations changes in the study area so an increased minimum length limit was not deemed an appropriate management strategy. The current minimum length limit in the study reservoirs is 305 mm TL, but nearly 10% of respondents noted that they would harvest fish less than 305 mm TL if it were legal. The angling community was evenly divided concerning reduced harvest of large-sized blue catfish. Several factors could have influenced angler response to this question, but it is possible that anglers do not usually catch enough large fish during one trip to be directly influenced by the regulation (Hunt and Hutt 2010, Kuklinski and Patterson 2011).

Motives and opinions of blue catfish anglers in north-central Texas were similar to those found in previous statewide surveys of Texas anglers (Wilde and Ditton 1999, Hunt and Hutt 2010). However, stakeholders were given an opportunity in this local survey to express their personal motivations and opinions concerning management of blue catfish fisheries they used, thus allowing them to participate in the fisheries management procedure. Responses from north-central Texas anglers and the statewide survey were useful, along with existing biological data, in garnering public support and agency approval to change the harvest regulation for Kirby Reservoir. Based on angler preferences found in this survey, the new regulation allows daily harvest of 50 fish (blue catfish and channel catfish in aggregate) with no minimum length limit, but only five fish may be ≥ 508 mm. This suggested change should appeal to the area's harvest-oriented anglers (increased bag limit and no minimum length limit) while providing increased protection to larger individuals in an effort to conserve diverse angling opportunities. Despite similarities between statewide surveys and this survey, localized surveys remain valuable for effective blue catfish management.

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