

## Social and Cultural Aspects of Paddlefish Anglers at Lake of the Ozarks, Missouri

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*Abstract:* An exploratory study was conducted on paddlefish (*Polyodon spathula*) anglers at Lake of the Ozarks near Warsaw, Missouri, to learn about their social and cultural aspects, such as activity involvement and place dependence in relation to travel distance. Although Lake of the Ozarks is a premier fishery in the state of Missouri, little is known about these participants. An on-site survey was completed and returned by 423 out of 595 anglers (71% response rate). Respondents were middle-aged men who lived in rural areas in Missouri, and traveled a median distance of 179.3 km (one way) to this location. The average angler started this activity at age 25.9 and had been a participant for 11.2 years. Socialization and harvest were important reasons for angling participation. Significant differences were found between proximate and distant paddlefish anglers on activity involvement and place dependence. Since activity involvement and place dependence scores were higher for distant anglers as compared to those traveling shorter distances, implications focused on marketing Lake of the Ozarks as a destination fishery.

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*Key words:* paddlefish, activity involvement, place dependence, fishing tourism.

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Snagging is the practice of jerking unbaited treble hooks through open water to capture fish. This technique requires a large reel, a thick line, a stout rod, heavy sinkers, and much patience. Although fishing regulations vary, snagging for paddlefish (*Polyodon spathula*) is legal in 14 states, including many of those along the Mississippi-Missouri River basin (Graham 1997). In Missouri, specimens weighing up to 45 kg are common while the state record is nearly 63.5 kg (Yasger and Bayless 2005). This “put-and-take” fishery is sustained through hatchery-raised fish since most of the natural spawning areas in Missouri have been eliminated (Beckett 2012).

The distribution of paddlefish habitat nationwide has decreased over the last century because of water pollution, river channelization, and the construction of dams for flood control and hydroelectric power (Carlson and Bonislawsky 1981). Because paddlefish are found in only 22 states (Graham 1997), anglers often have to travel long distances to participate in this activity. For example, Brooks and Ryckman (1993) reported the one-way travel distance of paddlefish anglers in North Dakota was 218.8 km (10% the anglers were non-residents). Similarly, the paddlefish fishery in the lower Yellowstone River, Montana, was comprised of 37% non-resident anglers (Scarnecchia et al. 1996).

Paddlefish snagging usually constitutes a relatively small, but enthusiastic segment of a fishery. Little information is known about these participants, possibly due to their lower social status

relative to other anglers (Dawson et al. 1993). Because snagging is an indiscriminate fishing practice, some anglers consider it to be unsportsmanlike (Catchings 1984), and public attitudes are often divided over this activity (Dawson et al. 1993). Although some research has been conducted on snagging (Catchings 1984, Dawson et al 1993, Scarnecchia et al. 1996, Scarnecchia and Stewart 1997, Bettoli 2012), more human dimensions studies are needed.

Fish consumption is an important angling motivation (Fedler and Ditton 1986), especially for snaggers (Catchings 1984). A consumptive orientation can be defined as a desire to catch fish, attitudes on keeping and releasing fish caught, and the significance of the number and size of fish caught (Anderson et al. 2007). When given three options (“for sport, meat, or eggs”) over 80% of paddlefish anglers in Tennessee favored sport; however, conversations during the interview process revealed a number of other motives (Bettoli 2012). Scarnecchia et al. (1996) found that paddlefish anglers in Montana ranked “the thrill of hooking a paddlefish,” and “for the challenge of the sport” as the highest motivations for participation. However, these scores were ranked nearly the same as “to catch an unusual fish” and to “catch a large fish.” Although obtaining meat was of lesser importance, over two-thirds of anglers said they enjoyed eating paddlefish, and nearly half of the respondents equated the food quality of paddlefish to that of trout (Scarnecchia et al. 1996). Also, nearly two-thirds of the anglers de-

scribed a successful fishing trip as catching and keeping at least one paddlefish. Overall, these findings seem to indicate that harvest was an important motive for paddlefish anglers, at least those in Montana.

Angler motivations can be useful for managers if the findings do not produce an “average” angler which may not exist (Falk et al. 1985). Instead of using generic motives to develop fisheries policy, various target markets should be studied since the meaning of angling often differs among its participants (Fedler and Ditton 1994). However, relatively few studies in the fishing literature have investigated social-psychological aspects (Kyle et al. 2007), such as activity involvement (AI) and place attachment (PA).

Frequency of participation in leisure pursuits led researchers to investigate the personal meanings of recreation, otherwise known as AI. Closely aligned with commitment, AI is the unseen state of motivation, feeling, and interest toward recreational activities (Havitz and Dimanche 1997). Furthermore, involvement is how individuals think about recreational activities and how participation influences their lives. In this context, AI is a psychological process that often leads to behavioral expressions of commitment (Iwasaki and Havitz 2004).

McIntyre (1989) developed a questionnaire to measure AI that consisted of three factors: attraction, self-expression, and centrality. Attraction is thought to be a combination of importance and pleasure. Although pleasure and enjoyment of the activity are aspects of attraction, they do not indicate high involvement unless the activity was important for individuals. The next factor, self-expression, is an indicator of how people felt about themselves through participation. The last factor, centrality, is the importance or value that activities play in an individual's life. Centrality indicates the presence of a unique ethos, which, in turn may lead to the development of a fishing subculture—a unique segment of the angling population.

Building on “sense of place” studies (Tuan 1977), researchers began to examine the symbols and meanings that individuals often attribute to outdoor settings (Altman and Low 1992). This inquiry led to the development of place attachment, a common expression used to describe an individual's emotional, cognitive, symbolic, or spiritual response to a particular physical surrounding or environment (Smaldone et al. 2005). Some authors have shown that frequency of visitation is related to higher levels of place attachment (Moore and Graefe 1994), but Schroeder (2002) found that certain individuals could form emotional attachments on the first visit. Attachment is often operationalized as a two-dimensional construct, consisting of identity and dependence (Williams and Vaske 2003); however, this relationship does not always act uniformly (Budruk et al. 2008).

Place identity (PI) is associated with the emotional and symbolic attachments that people often develop in outdoor areas (Moore and Graefe 1994, Hunt 2008) and the meanings those settings have for individuals (Stedman 2002). Place dependence (PD), in contrast, is the ability of settings to satisfy the functional needs of individuals (McCool and Martin 1994). In other words, PD facilitates users' activities in relation to alternative locations (Moore and Graefe 1994) and may fluctuate based on perceptions of environmental quality (Smaldone et al. 2005).

Although PI is a better gauge of emotional bonding with outdoor settings, it may not be the most important managerial finding. Place dependence is usually developed quicker than PI (Moore and Graefe 1994). Although anglers can become attached to a location based on their desire to catch a specific fish (Hunt 2008), no significant variations were found in PD across four angler segments in South Carolina (Kyle et al. 2007). Generally speaking, anglers will revisit specific locations if they feel a sense of attachment, especially if word-of-mouth is favorable. According to Kyle et al. (2004), PD does not prevent visitation, even under crowded conditions.

Few studies have examined proximity in relation to place attachment (Beckley 2003) but none using AI. Nyaupane and Graefe (2008) studied visitors at a national forest and found that place attachment was inversely related to travel distance. According to Moore and Scott (2003), there was a negative relationship between travel time and place attachment. Some research has shown that PD may rely on the availability of suitable alternatives (Hunt 2008), thus dependence may increase when fewer options are available. Budruk et al. (2011) reported that proximate visitors at two reservoirs scored higher on PI, but not on PD when compared to those traveling longer distances. Due to mixed findings, more research is needed to understand the relationship between proximity and PD, especially for anglers.

This study examined some social and cultural aspects of paddlefish anglers at Lake of the Ozarks, Missouri, including demographic information and motivations for participation. In addition, AI and PD were measured in relation to travel distance. These findings may have some implications for destination fishing.

### Study Area

Lake of the Ozarks in central Missouri is one of the largest man-made reservoirs in the Midwest. Created in 1931 by impounding a portion of the Osage River, it has a surface area of approximately 22,257 ha and 1,850.7 km of shoreline. Although constructed mainly to generate hydroelectric power, Lake of the Ozarks has become an ideal tourism destination—largely because of private sector investment. Recreational boating and fishing are two of the

most common outdoor activities at the reservoir, so marinas, food, and lodging options are plentiful.

Paddlefish are native to Missouri and flourished even after Lake of the Ozarks was built. However, construction of the Harry S. Truman Dam on the Osage River in 1979 inundated their historic spawning grounds and eliminated natural reproduction. The paddlefish population is now maintained by supplemental stocking by the Missouri Department of Conservation (MDC). Approximately 15,000 hatchery-raised fingerlings are released annually, with a pulse stocking of up to 30,000 paddlefish every third year (Beckett 2012). Lake of the Ozarks supports the largest snagging fishery in Missouri and one of the largest in the nation (Graham and Fry 1992).

Most of the annual paddlefish harvest at Lake of the Ozarks occurs in the upper portion of the Osage River Arm below Truman Dam. Paddlefish movement and harvest during the spawning season is dependent on weather conditions, mainly water temperature and flow. Upstream spawning migrations occur when water temperatures are 10–13 C and are accompanied by an increase in flow. Without the right environmental conditions, paddlefish do not make spawning runs which impacts angler success (Trish Yasger, MDC, personal communication).

Weekly roving creel surveys were conducted by MDC biologists on paddlefish anglers using the Upper Osage Arm at Lake of the Ozarks during the 45-day season from 2000 to 2006. These surveys revealed that a mean of 87,130 snagging hours and 22,360 trips occurred annually on this fishery during that period. Additionally, mean harvest was 11,587 paddlefish with a mean length (eye-to-fork length, EFL) of 99.1 cm and mean weight of 19.1 kg for males and females combined (Trish Yasger, MDC, personal communication).

## Methods

An on-site survey was administered to paddlefish anglers at Lake of the Ozarks between 15 March–30 April 2007 (opening and closing days). Anglers were asked to complete the questionnaire when they were resting or after they had stopped fishing for the day. The sample consisted exclusively of boaters because paddlefish snagging from the bank was not practiced at this site. Consenting individuals were given a questionnaire and it took them about 10–15 min to complete. All responses were anonymous. The survey began on opening day of paddlefish season and thereafter was conducted on seven consecutive weekends (Saturdays and Sundays) from 1100 to 1700 hours. Data collectors identified themselves as university students so they would not be confused with employees from the MDC. This was a purposive sample since it targeted members of a known group (Babbie 2009).

The three-page survey consisted mostly of short-answer, closed-ended questions, modeled after a study developed by Morgan (2008). Demographic characteristics focused on age, gender, place of residence, zip code, education, and income. Social factors included party size and composition, along with items to measure how participants learned about paddlefish snagging and if they had taught anyone else about it. Anglers were asked what they considered to be a trophy size paddlefish (weight and length), and questions about their catch-and-release behavior, size preferences, and attitudes toward bag limits. Additionally, six items describing the consumptive motives of paddlefish anglers in Montana (Scarnecchia et al. 1996) were administered to Missouri paddlefish anglers for comparison purposes. Each statement was rated from 1 to 5 (not important to very important, respectively).

A slightly modified version of the AI scale developed by McIntyre (1989) was used in this study. It consisted of 11 items, including three factors: attraction (four items), self-expression (four items), and centrality (three items) and had a reliability coefficient of 0.86. Anglers participating in the survey evaluated each statement independently using a Likert-type approach anchored by the terms 'strongly disagree' to 'strongly agree' (coded 1–5, respectively). The second measure was a five-item PD scale, nearly identical to the one used by Williams and Vaske (2003). Place dependence was measured using a five-point approach, similar to the AI scale and had a reliability of 0.87.

Data collection occurred at two locations on the Osage River Arm (upper portion of Lake of the Ozarks but below the Harry S. Truman Dam) to ensure representation from different segments of snagging population: 1) Old Oar House Inn and Marina (a private facility) and 2) Gordon Drake Memorial Harbor (a public facility). Two post hoc groupings of paddlefish anglers were created based on travel distance between their residence and location of the snagging fishery (Warsaw, Missouri) using zipcodes and MapQuest. Mileage was sub-divided into: proximate anglers (< median travel distance) and distant anglers (> median travel distance). Independent samples *t*-tests were used to compare travel distance (the independent variable) with AI and PD (the dependent variables).

## Results

An on-site survey was distributed to 595 anglers, and 423 completed the questionnaire (71.1% response rate). Most (85.3%) anglers were from Missouri, followed by Kansas (6.6%), Nebraska (2.6%), and those in six other states (2.4%). The median, one-way travel distance to Warsaw, Missouri, was 179.3 km (SD=153.4). Travel distance was not normally distributed. The average participant was a 40-year-old (mean=40.3±12.3 SD) male (90%) who

lived in a rural area ( $\leq 5,000$  residents). Nearly two-thirds of the anglers had completed college (61.5%). The majority of respondents were employed (85%) and approximately 24% of them reported an income of \$40,000–\$54,999. Most individuals began paddlefish angling in their mid-twenties (mean =  $25.9 \pm 12.5$  SD) and had participated in this activity for about 11 years (mean =  $11.2 \pm 11.0$  SD). On average, participants knew about 28 other paddlefish anglers. Over half of the respondents learned about snagging techniques from friends (53.4%), followed by instruction from their parents (18%). Fishing parties consisted mostly of friends / family members (64%). Socialization was an important reason for participation since over three-fourths of the sample (77%) had taught someone else about this activity.

Motivations were examined through responses to six items related to catch and harvest factors (Table 1). Average responses for each of the motives were greater than 3.5, ranging from 3.6 (“To catch an unusual fish”) to 4.5 (“For the thrill and experience of hooking one”). Other items measured anglers’ catch-and-release behavior, preferences, and bag limit policies. Over half (56.6%) of the sample reported no catch and release of legal-sized paddlefish ( $\geq 86.3$  cm EFL). Most anglers (67%) indicated that they would rather catch one really large fish (67%) than two smaller ones. Over three-fourths of anglers “agreed” (46.3%) or “strongly agreed” (32.9%) with the current bag limit (two fish per day). Anglers considered a trophy-sized paddlefish to be about 34.0 kg and 132.1 cm EFL.

The AI scale initially included 12 items that consisted of: attraction (mean =  $3.8 \pm 0.7$  SD), self-expression (mean =  $3.4 \pm 0.7$  SD), and

centrality (mean =  $3.3 \pm 0.8$  SD). However, the total item correlation for the statement, “I have little interest in snagging” was 0.25, lower than the value cut-off of 0.30 as recommended by Field (2005), so it was excluded. This action resulted in an overall reliability coefficient of 0.862 for the AI scale. The highest single item was “I enjoy discussing snagging with my friends” (mean =  $4.1 \pm 0.7$  SD), was found in centrality. Sub-scale reliabilities for attraction, self-expression, and centrality were 0.744, 0.824, and 0.641, respectively (Table 2). The PD scale initially included 6 items. However, the statement “I would enjoy snagging at a similar site just as much as Lake of the Ozarks” yielded a total item correlation of 0.14 and was deleted from the PD scale, thus resulting in an overall reliability of 0.865. About 44% of participants “agreed” or “strongly agreed” with the statement, “Lake of the Ozarks is the best place for snagging”, which was the highest rated statement (mean =  $3.6 \pm 0.9$  SD) of all PD items (Table 3).

Travel distance to Warsaw, Missouri, was not correlated with AI ( $r = 0.069$ ,  $P = 0.182$ ) or PD ( $r = 0.041$ ,  $P = 0.415$ ). The AI scores of

**Table 1.** Consumptive motives for paddlefish anglers in Montana and Missouri<sup>a</sup>.

Items	Montana		Missouri	
	<i>n</i>	mean	<i>n</i>	mean
For the thrill and experience	341	4.46	412	4.45
To catch a really large fish	341	3.88	410	4.22
For the challenge or sport	341	4.28	411	4.18
To obtain meat for eating	342	3.14	415	3.95
To catch an unusual fish	341	3.96	410	3.60

a. Each item was rated ‘not important’ to ‘very important’ and coded 1–5, respectively.

**Table 2.** Summary statistics and reliability scores of activity involvement (AI) for paddlefish snaggers at Lake of the Ozarks.

Factors / Items	<i>n</i>	mean	SD	Item total correlation	Alpha if item deleted
<i>Attraction</i> ( $\alpha = 0.7439$ )					
Snagging offers me relaxation when life’s pressures build up	419	3.77	0.66		
Snagging is one of the most satisfying things I do	419	3.89	0.98	.48	.71
Snagging is one of the most satisfying things I do	416	3.46	0.93	.66	.64
Snagging is one of the most enjoyable things I do	418	3.58	0.87	.65	.65
I have little interest in snagging <sup>a</sup>	411	4.22	1.00	.25	.80
Snagging is very important to me	401	3.73	0.90	.56	.68
<i>Self-expression</i> ( $\alpha = 0.8239$ )					
When I am snagging others see me the way I want them to see me	417	3.42	0.73		
When I am snagging I can really be myself	415	3.55	0.87	.67	.77
You can tell a lot about a person when you see them snagging	416	3.79	0.82	.58	.81
Snagging says a lot about who I am	414	3.19	0.92	.64	.78
Snagging says a lot about who I am	415	3.15	0.96	.71	.75
<i>Centrality</i> ( $\alpha = 0.6407$ )					
I find that a lot of my life is organized around snagging	419	3.25	0.77		
I enjoy discussing snagging with my friends	415	2.72	1.10	.54	.41
Most of my friends are in some way connected with snagging	417	4.10	0.70	.56	.37
Most of my friends are in some way connected with snagging	417	2.94	1.13	.30	.71
Total AI ( $\alpha = 0.8624$ )	419	3.53	.59		

a. reverse-coded and deleted

**Table 3.** Summary statistics and reliability scores of place dependence (PD) on paddlefish snaggers at Lake of the Ozarks (LO).

Items	<i>n</i>	mean	SD	Item total correlation	Alpha if item deleted
LO is the best place for snagging	417	3.58	0.94	.69	.84
No other place compares with LO	414	3.24	0.99	.81	.81
I get more satisfaction from snagging at LO than any other place	415	3.46	0.93	.79	.81
Snagging at LO is more important than doing it at another place	413	3.32	0.93	.83	.81
I wouldn't substitute any other area for snagging at LO	416	3.19	1.05	.76	.82
I would enjoy snagging at a similar site just as much as LO <sup>a</sup>	416	2.47	0.93	.14	.92
Total PD ( $\alpha = 0.8653$ )	417	3.4	.85		

a. reverse-coded and deleted

**Table 4.** *T*-tests comparing travel distance with activity involvement (AI) and place dependence (PD) of paddlefish anglers in Missouri<sup>a</sup>.

Variable	Group	<i>n</i>	mean	df	<i>t</i>	<i>P</i>
Attraction	Proximate	197	3.60	386	2.24	.026
	Distant	191	3.76			
Self-expression	Proximate	201	3.36	396	2.15	.032
	Distant	197	3.51			
Centrality	Proximate	201	3.22	400	0.96	.337
	Distant	201	3.29			
Total AI	Proximate	191	3.41	373	2.64	.009
	Distant	184	3.57			
Total PD	Proximate	204	3.26	404	2.29	.023
	Distant	202	3.45			

a. AI and PD were measured on a 5-point scale from 'strongly disagree' to 'strongly agree'.

proximate (mean = 3.4) and distant (mean = 3.6) paddlefish anglers were significantly different ( $t = 2.64$ ,  $df = 373$ ,  $P = 0.009$ ) at the .05 alpha level (Table 4). The relationship was influenced heavily by two factors: attraction (mean = 3.6 versus mean = 3.8, respectively) and self-expression (mean = 3.4 versus mean = 3.5, respectively). In addition, PD and travel distance were related since the overall scores of proximate (mean = 3.3) and distant (mean = 3.5) paddlefish anglers were different ( $t = 2.3$ ,  $df = 404$ ,  $P = 0.023$ ) at the .05 alpha level.

## Discussion

This exploratory study examined some social and cultural aspects of paddlefish anglers at Lake of the Ozarks, Missouri. Missouri anglers were similar to those in Montana (Scarnecchia et al. 1996) and North Dakota (Brooks and Ryckman 1993) on the following characteristics: gender, age, income, and education level. Paddlefish anglers in Missouri traveled over 177 km (one-way) to their fishing destination, comparable to the distance reported by those in North Dakota (218.9 km), but dissimilar to those in Tennessee (80 km) (Bettoli 2012). Typical groups consisted of four individuals, slightly higher than ones in North Dakota and over twice the party size of paddlefish anglers in Tennessee. Paddlefish

anglers in Missouri had more fishing experience than those in Tennessee (11.2 years as compared with 6.8).

Missouri paddlefish anglers scored higher on motives such as: "to obtain meat for eating" and "catching a really large fish" than paddlefish anglers in Montana. Both sets of anglers ranked the experience and challenge of paddlefish angling similarly, but Missouri anglers ranked "catching an unusual fish" much lower than their counterparts in Montana. Both sets of anglers agreed that they would rather catch one large paddlefish than two smaller ones, which may indicate that paddlefish anglers typically want to catch and keep large paddlefish, regardless of location. Although the consumption motive contradicts some previous findings that showed relaxation, getting away from daily routines, and being outdoors are important reasons for fishing participation (Fedler and Ditton 1994), it is consistent with those who pursue larger fish (Fedler and Ditton 1986).

Morgan (2006) used the AI scale developed by McIntyre (1989) to compare trout anglers with hand fishers. Although these groups are on opposite ends of the fishing hierarchy, trout anglers and hand fishers had nearly identical AI scores (Morgan 2006). Since hand fishers scored significantly higher than trout anglers on centrality, Morgan thought that hand fishers had developed a subculture consisting of a set of "special beliefs, values, moral principles, norms, and performance standards" for their activity (Stebbins 1982). Bryan (1977) had suggested previously that highly specialized anglers would create a social world consisting of attitudes and ideologies shared by its participants, thus setting a standard for those wanting to attain it.

The overall mean for AI, inclusive of the sub-scores for attraction, self-expression, and centrality were lower than expected. Because paddlefish snagging was practiced with family members and friends, there was a high degree of socialization with this activity; thus, these social aspects should have increased the AI score. Paddlefish anglers scored considerably lower than hand fishers in Missouri on this measure, with centrality being the lowest rated factor (Morgan 2006). The low AI score suggested that a strong paddle-

fish subculture may not exist. Perhaps anglers find it difficult to organize around an activity that has such a short season (about six weeks). In contrast, a lower centrality score may indicate that meat harvest played an important role for Missouri paddlefish anglers.

Paddlefish anglers who traveled greater distances found this activity to be more meaningful than those living nearby the site. This finding warrants further investigation. Anglers living closer to this resource may become complacent about its value, whereas those living farther away may have greater appreciation for it due to its scarcity. Also, the anglers who traveled greater distances showed more dependence on the place as compared to local anglers. This finding is inconsistent with Budruk et al. (2011) who found no relationship between proximity and PD. Nyaupane and Graefe (2008) also found an inverse relationship between travel distance and place attachment, but their results were based on a four-item, composite score which contained two measures of identity and two for dependence, rather than using a “pure” scale (either identity or dependence, but not both). Because paddlefish snagging is geographically-limited, some anglers have to travel long distances since viable options or substitutes cannot be found locally (Hunt 2008).

Over half of the anglers (54%) believed that Lake of the Ozarks was the best location for paddlefish snagging. This opinion may be influenced by the relative abundance of paddlefish in the reservoir or the liberal bag limits as compared with other states. Due to intensive stocking efforts by MDC and the presence of Truman Dam, the likelihood of capturing one or more paddlefish on any given trip to this site was relatively high, especially since most of the boats were equipped with sonar technology. In Missouri, the four-fish possession limit (per trip) is twice the amount of paddlefish taken per year in Montana and North Dakota (Brooks and Ryckman 1993, Scarnecchia et al. 1996). Harvesting several paddlefish on one trip could be a powerful incentive for anglers traveling long distances, one possible explanation for the higher AI and PD scores.

### Implications and Future Research

One goal of the Missouri Department of Conservation is to manage paddlefish as trophy sport fisheries (defined by the average weight of harvested paddlefish  $\geq 13.6$  kg and at least 20% of the catch weighs  $\geq 22.7$  kg; Graham and Fry 1992). Since Lake of the Ozarks supports the largest snagging fishery in Missouri, it should be promoted as a fishing destination. Missouri is unique compared to other states in relation to possession limits, season length, and supplemental stocking of paddlefish. Marketing efforts, possibly in conjunction with the Missouri Division of Tourism, should focus on the benefits of participation.

Fishing tourism is popular among nonresident anglers (Ditton et al. 2002). Since long-distance nature tourists spend more time and money than local visitors (Leones et al. 1998), out-of-state paddlefish anglers are the logical targets of this marketing effort. Promotional strategies might feature paddlefish snagging tournaments or family fishing vacations. This advertising campaign could be co-managed with the private sector, thus stimulating the local economy—an important tourism industry goal (Fedler and Ditton 2000). Since most non-resident paddlefish anglers in this study came from Kansas and Nebraska, promotional efforts could be intensified in these two states. However, Illinois and Texas are the top two “suppliers” of non-resident anglers to other states for fishing purposes (Ditton et al. 2002), thus representing even greater markets because paddlefish numbers have been declining in Illinois and Texas does not permit sport harvest of paddlefish (Graham 1997). Since both of these states are populous and relatively close to Missouri, they might serve as good test markets. Further research should examine the economic impact of paddlefish snagging in Missouri.

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