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Profile of Recreational Paddlefish Snaggers on the Lower Yellowstone River, Montana

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Abstract.—In 1993, a questionnaire was administered to 353 recreational snaggers of paddlefish *Polyodon spathula* at Intake, Montana, an irrigation diversion dam on the lower Yellowstone River and the site of an annual harvest of 500–5,000 paddlefish. Through a questionnaire, snaggers were asked to describe their socioeconomic characteristics; their values, attitudes, and motivations regarding fishing for paddlefish; and their attitudes on specific fishery regulations. Snaggers were most likely to be young or middle-aged men (modal age 30–39) and to be either unemployed or employed in professions yielding an annual income of US$20,000–40,000. Contrary to some stereotypes about snaggers, their values and motivations for snagging were similar to those of other more traditional anglers. Primary motivations for fishing included the opportunity to be outdoors, the experience and thrill of hooking a paddlefish, and to be with friends. A weaker motivation was to obtain meat for consumption (even though snaggers rated paddlefish meat highly), and few snaggers ate paddlefish eggs as caviar. The survey strengthens the concept that paddlefish snagging can be viewed as something other than a meat harvest. Snaggers preferred regulations that allowed them to catch and keep two fish, even though most said they did not have to catch two fish to be satisfied with the fishing experience. Results from the survey were used to implement a reduced bag limit and catch-and-release fishing periods.

The use of surveys to assess and classify angler values, attitudes and preferences has become commonplace in many inland fisheries management programs (e.g., Chipman and Helfrich 1988; Quinn 1992). Surveys have often been developed for conventional species-specific fisheries (e.g., Spencer and Spangler 1992) or for anglers in general within a state or region (e.g., Samples and Bishop 1981; Harris and Bergersen 1985; Brooks 1991).

A few studies have focused on snag fisheries, and some have addressed issues of snagging as portions of broader studies. In a study of a snag fishery for Pacific salmon *Oncorhynchus* spp. in New York, Dawson et al. (1993) reported that snaggers' depreciative behavior led to controversy that eventually caused elimination of snagging. Fenske (1983) reported that most salmonid anglers in Michigan supported salmon snagging in that state, at least in restricted areas. Samples and Bishop (1981) reported that 56% of Wisconsin's sport anglers snagged for trout and salmon, 60% of all anglers thought that it was sporting, and 40% thought that it was distasteful and should be prohibited. Catchings (1985) conducted a creel survey of snaggers attempting to catch a variety of game and nongame fishes below two dams on the Coosa River, Alabama; those fishers snagged mainly to obtain food and, to a lesser extent, for sport.

The paddlefish *Polyodon spathula*, a large, zooplanktivorous fish native to the Missouri and Mississippi river drainages (Gengerke 1986), supports recreational snag fisheries in several states (Combs 1986). Because of the paddlefish's planktivory (Russell 1986) and its unwillingness to take baits, snagging is the only common method of recreational harvest (unlike salmonids and most other species, which may be snagged in some situations but caught with artificial lures or baits in others).

In eastern Montana, an important fishery for paddlefish exists at Intake, near the City of Glendive, immediately below a low-head irrigation diversion dam on the Yellowstone River (Scarnecchia et al. 1996). This fishery attracts snaggers from many states. From 1972 to 1993, between 550 and 5,318 paddlefish have been harvested annually from this stock (the Yellowstone–Sakakawea stock) at Intake (Stewart 1994).

Increased harvest and participation in paddlefish snagging at Intake prompted our study. Because snagging is often disparaged by traditional recreational anglers (e.g., Samples and Bishop 1981; Catchings 1985), increased participation created the potential for confrontation among user groups. An understanding of the values, attitudes, and motivations of paddlefish snaggers, and how these differ from those of other user groups, may help prevent or alleviate future controversies over snagging. Increased harvest rates, decreasing snagging success rates, and aging of the paddlefish stock (Stewart 1994; Scarnecchia et al. 1996), have led the Montana Department of Fish, Wildlife and Parks to consider additional restrictions on paddlefish snagging. Knowledge about how snaggers might respond to specific regulation changes would facilitate efforts to manage snag fisheries in Montana and perhaps other areas of the country.

Methods

Our study was conducted in 1993 during the paddlefish season, May 15–June 30. Snagging is typically conducted by jerking a large treble hook (size 8/0 to 10/0) and a 113–170-g lead weight through the water on 9–23-kg-test line with a long spinning rod and reel. Retention of landed paddlefish was mandatory; once a person had caught the allotted two paddlefish, he or she was not permitted to continue snagging. Landed paddlefish were required to be tagged at the front of the dorsal fin with an individually numbered, locking tag. Snagging was permitted only from shore within 0.37 km of the diversion dam but was legal either from a boat or from shore further downstream of the dam. The main fishing site surveyed was along both banks on the 0.25-km stretch of river immediately below the diversion dam.

The questionnaire consisted of 36 written questions (Duttweiler 1976), including two questions with multiple parts (19 parts for one question and 16 for the other). General questions not specific to the paddlefish fishery at Intake were modeled after surveys administered in 1986 and 1987 by the Texas Parks and Wildlife Department (Texas Parks and Wildlife Department and Texas A&M University 1986, 1987). Other questions specific to the paddlefish fishery at Intake were added. Questionnaires were reviewed by two specialists in the human dimensions of fisheries for inconsistencies, wording, and question sequence.

The questionnaire was administered daily during the entire snagging season for 18 h/d (from 0600 to 2400 hours), whenever snaggers were present. One randomly selected, actively fishing person per fishing party was surveyed, unless the fishing party consisted of both males and females. In that case, one male and one female were surveyed to assess if responses differed by gender. Over 90% of the snaggers approached were willing to complete the questionnaire during rest intervals. (Because paddlefish snagging is strenuous, snaggers rest frequently.)

One series of questions addressed the motivations of snaggers (Table 1); a second series of questions addressed the snaggers values, attitudes, and preferences on snagging paddlefish and on bag limits (Table 2). Another question asked respondents to rank the desirability of paddlefish in relation to four other popular game fish species. Likert scales (five ordered options) were used for responses to these questions (Bobko 1995). Distributions of responses were analyzed according to age ($\leq$34 years, $\geq$35 years), gender (male, female), state of residence (Montana resident, nonresident), annual income (<US$30,000, $\geq$$30,000), and educational level (high school attendee or graduate, college attendee or graduate). The null hypotheses tested with chi-square test of independence were that age, gender, state of residence, income, and education did not differentially affect responses. A Kruskal–Wallis test (Conover 1980) was used to compare rankings of responses to the questions on motivations and attitudes (Tables 1, 2), species desirability preferences, and the relation between trip catch and satisfaction. Multiple comparisons (Conover 1980) between trip satisfaction and catch were made with the least-significant-difference test. In all tests, $P < 0.05$ was required for significance.

Results

Demographics and Fishing Habits

The 353 questionnaires completed (an estimated 25% of the total number of snaggers at Intake in 1993) were obtained from 87% males, 9% females, and 4% persons of unidentified gender. Fifty-eight percent of the questionnaires were completed by residents of Montana, and 37% by nonresidents; 5% of the respondents were not identified by place of residence. Snaggers were most likely to be young or middle-aged men. The most common age-groups (males and females combined) were 30–39 (30%), 20–29 (24%), and 40–49 (21%). Few persons age 60 or older actively snagged (1%). Respondents were nearly evenly split between persons age 35 and older (50%) and age 34 and younger (49%), with 1% of unknown age.

TABLE 1.—Motivations of 353 paddlefish snaggers. Responses were rated on a scale of 1 to 5 (1 = not important, 3 = neutral, 5 = very important). Nonresponse to specific questions ranged from 2% to 3%. Rank refers to level of statistical importance in relation to other motivations (Kruskal–Wallis test, $P < 0.05$). The lower the numbered rank (i.e., 1), the more important the motivation. Motivations that share a rank or combination of ranks (e.g., 4–5–6 and 6, 7) are not significantly different from each other ($P > 0.05$).

Motivation	Response distribution (%) for scale values: 1	2	3	4	5	*N*	Mean scale rating	Rank
To be outdoors	1	2	8	27	62	341	4.47	1–2
For family recreation	6	6	21	28	39	340	3.88	4–5
To experience new and different things	5	6	18	30	41	341	3.98	4
For relaxation	4	5	17	33	41	340	4.02	4
To be close to the river	6	10	25	26	33	342	3.71	6–7
To obtain fish meat for eating	18	14	25	23	20	342	3.14	8
To get away from the demands of other people	10	8	18	23	41	341	3.78	4–5–6
For the experience and thrill of hooking one	3	2	8	22	66	341	4.46	1
To be with friends	1	3	10	32	54	341	4.35	2–3
To eat the eggs	80	9	7	2	1	338	1.37	9
To experience natural surroundings	7	5	24	28	36	341	3.82	5–6
To get away from the regular routine	2	4	9	31	54	341	4.29	3
To catch a really large fish	7	7	20	23	43	341	3.88	4–5
For the challenge or sport	2	4	13	28	53	341	4.28	3
To catch an unusual fish	6	6	20	24	44	341	3.96	4
To meet new people at the fishing site	12	9	25	24	30	341	3.51	7

Respondents were a mixture of experienced and novice snaggers. Thirty percent had snagged for paddlefish at Intake each of the past 5 years; 40% had snagged only 1 year out of the past 5 years or were snagging at Intake for the first time.

About half of the snaggers also angled with bait or lures for other species during their paddlefishing trip to Intake. Target species were mainly channel catfish *Ictalurus punctatus* (115 respondents), shovelnose sturgeon *Scaphirhynchus platorynchus* (52 respondents), sauger *Stizostedion canadense* (33 respondents), and walleye *Stizostedion vitreum* (29 respondents). Twenty-seven percent of the snaggers fished with baits or lures at least 50 d/year, 12% fished 1–9 d/year, and 12% fished at no other time of the year. During the rest of the year, the active anglers fished most often for salmonids (117 respondents), walleye (91 respondents), and channel catfish (38 respondents).

Socioeconomic Characteristics

In general, paddlefish snaggers at Intake who were employed tended to have professions such as miner, oil field worker, construction worker, electrician, pipefitter, salesperson, serviceperson, small business worker, farmer, rancher, equipment operator, or truck driver. Unemployed persons (which included retirees) and students were also common.

Most snaggers had low to moderate household incomes and educational backgrounds. The most common responses to household income before taxes were $30,000–39,999 (21%), $20,000–29,999 (20%), and $10,000–19,999 (16%). Nine percent of respondents had an income exceeding $70,000. Ten percent had not graduated from high school, 45% had graduated from high school, 21% had attended college but not graduated, 16% had degrees from 4-year institutions, and 5% had advanced degrees.

Motivations for Paddlefish Snagging

Highest ranking motivation (Kruskal–Wallis test, $P < 0.05$) for snaggers were to be outdoors, for the experience and thrill of hooking a paddlefish, to be with friends, to get away from the regular routine, and for the challenge or sport. Lower ranking motivations ($P < 0.05$) were relaxation, to experience new and different things, to catch an unusual fish, for family recreation, to catch a really large fish, and to experience natural surroundings. Somewhat less important motivations ($P < 0.05$) were to meet new people and to obtain meat for eating. In contrast, few were motivated to snag a paddlefish to obtain the eggs for caviar (Table 1).

Perceptions on Paddlefish and Paddlefish Snagging

Perceptions on paddlefish.—When asked to rank the desirability of the species in general (i.e., the fish itself, including food value, sport value, and

TABLE 2.—Attitudes of paddlefish snaggers toward the fish and toward the harvest regulations expressed in percentage of responses to 20 questions (a–s). Responses were recorded on a Likert scale (strongly disagree, SD; disagree, D; neutral N; agree, A; strongly agree, SA). Percentages do not include nonresponse (2–6%) to specific questions or questions deemed not applicable by respondent (0–10%).

Question	Percent respondents that:					*N*
	SD	D	N	A	SA	
(a) I enjoy eating paddlefish.	3	3	20	25	49	314
(b) The bigger the paddlefish I catch, the better the trip.	6	8	33	13	40	335
(c) A successful trip is one in which my limit of two paddlefish is caught.	12	14	24	18	32	330
(d) Paddlefish is as good to eat as trout.	15	10	23	14	38	302
(e) I am just as happy if I catch one paddlefish as two fish, as long as I do not get skunked. (skunked = catch no fish)	11	7	17	28	37	339
(f) I would rather catch one big paddlefish than two small paddlefish	17	9	30	15	29	339
(g) I would be just as happy if I didn't keep the two fish I'm entitled to catch, as long as I could be photographed next to them.	41	18	17	9	15	338
(h) Without paddlefishing at Intake, I wouldn't spend any time in the Glendive/Intake area.	18	10	12	16	44	334
(i) I feel unsuccessful if I catch only one paddlefish.	38	23	23	9	7	338
(j) With less than a two fish annual limit, I wouldn't find it worthwhile to come to Intake for paddlefishing.	24	13	14	12	37	343
(k) I enjoy paddlefish snagging more than other types of fishing.	16	13	43	14	14	340
(l) I would find a one fish annual limit just about as satisfactory as the current two fish limit.	45	16	15	9	15	343
(m) There's really not that much special about paddlefish to me other than that they are large.	43	23	17	10	7	340
(n) The paddlefish is a really special fish and I feel privileged to be able to fish for them.	1	1	11	25	62	344
(o) I would find a three fish annual limit just about as satisfactory as the current two fish limit.	19	11	20	15	35	342
(p) Snagging is an acceptably sporting way to catch paddlefish.	1	2	10	23	64	338
(q) I prefer snagging paddlefish at night to snagging during daylight hours.	12	7	57	12	12	325
(r) Paddlefish is as good to eat as walleye.	25	15	26	15	19	303
(s) I enjoy the people and the social atmosphere on a busy day at Intake. It makes paddlefish snagging more fun.	8	8	20	22	42	339

all other intangible values; 1 = most desirable, 5 = least desirable) against four other species—walleye, northern pike *Esox lucius,* cutthroat trout *Oncorhynchus clarki,* and largemouth bass *Micropterus salmoides*—walleye (mean = 1.98) ranked higher than paddlefish (2.32), followed by cutthroat trout (2.44), northern pike (2.82), and largemouth bass (2.91). Statistically, the walleye was the most preferred species, followed by the group including cutthroat trout and paddlefish, and lastly the group including northern pike and largemouth bass (Kruskal–Wallis test, $P < 0.05$).

Even though eating paddlefish was not highly ranked compared with other motivations, nearly 68% of snaggers enjoyed eating paddlefish. Forty-seven percent thought it equal in eating quality to trout, whereas only about 25% thought it inferior to trout. In contrast, meat from walleye was more highly regarded than paddlefish.

Perceptions on snagging.—Eighty-six percent of respondents found snagging to be an acceptable way to catch paddlefish; only 2% did not think it sporting. Snaggers found paddlefishing about as enjoyable as other types of fishing (30% less enjoyable, 27% more enjoyable, 43% neutral).

Trip satisfaction and catch.—Among returning snaggers, 72% were satisfied with their most recent paddlefishing trip; only 17% were dissatisfied.

Higher satisfaction was claimed by those snaggers catching more paddlefish. Mean catch of snaggers highly satisfied with their last fishing trip was 1.6 fish/snagger ($N = 144$), and for those satisfied it was 1.2 fish/snagger ($N = 66$). The satisfaction of snaggers in those two groups was significantly ($P < 0.05$) greater than for those with neutral satisfaction (0.7 fish/snagger; $N = 32$) and for those dissatisfied (0.6 fish/snagger; $N = 30$). Those dissatisfied and very dissatisfied (0.9 fish/snagger; $N = 19$) were not statistically different ($P > 0.05$).

Attitudes Toward Regulations

In general, snaggers did not find the prospect of a one-fish annual limit as satisfactory as a two-fish limit. Sixty-one percent of snaggers thought it would be less satisfactory, and only 24% thought it would be as satisfactory or more satisfactory (Table 2). If the neutral responses are interpreted as satisfactory, the percentage of snaggers that would be satisfied with a one-fish limit increased to 39% (Table 2).

Although many snaggers did not prefer a more conservative bag limit, neither did they necessarily prefer a more liberal one. Nearly half (49%) thought a three-fish limit would be at least as satisfactory as a two-fish limit, but 31% thought it would not be as satisfactory (Table 2).

The preference for a two-fish bag limit did not, however, indicate that snaggers necessarily felt unsuccessful if they caught only one. Sixteen percent felt unsuccessful if they caught only one fish but 64% did not feel this way (Table 2). This response was consistent with their response to the statement: "I am just as happy if I catch one paddlefish as two fish, so long as I do not get skunked" (i.e., catch no fish; Table 2). Sixty-four percent of respondents agreed with this statement, and only 18% disagreed. Nearly half (49%) of the respondents thought that it would not be worthwhile to travel to Intake for less than a two-fish limit; only 36% thought the trip would still be worthwhile (Table 2).

Catch-and-release fishing without any retention of paddlefish was not a favored alternative. When asked if they would substitute being photographed next to their two fish before releasing them, less than a fourth of the snaggers answered affirmatively (Table 2). A one-fish limit plus a catch-and-release option was not investigated. Snaggers generally preferred the prospect of catching one large paddlefish to two small paddlefish, but many snaggers (30%) were neutral on this question (Table 2). Two-thirds of snaggers agreed with the two-fish annual limit, and only 18% disagreed with it. Of those 63 snaggers who disagreed, only 17 thought the regulations were too restrictive; 18 snaggers thought a catch-and-release option was needed. Overall, snaggers were satisfied with the two-fish bag limit.

Responses by Age, Gender, State of Residence, Income, and Education

Age.—Snaggers age 35 and older had lower demands for harvesting and eating paddlefish than did younger snaggers. Older snaggers did not equate catching their limit with a successful trip as strongly as did younger snaggers ($P < 0.05$). The older snagger was also much more likely to be just as happy catching only one fish as two fish ($P < 0.01$). Younger snaggers placed more importance than older snaggers on eating paddlefish ($P < 0.05$), on being with friends ($P < 0.01$), on meeting new people ($P < 0.05$), and on the thrill and enjoyment of hooking a paddlefish ($P < 0.05$). Although snaggers as a group were largely neutral about day versus night snagging, older snaggers were much more apt to prefer day over night snagging than were younger snaggers ($P < 0.05$).

Gender.—Catching a large paddlefish was significantly more important to male than female snaggers ($P < 0.01$). For male snaggers, catching one large paddlefish rather than two small paddlefish was much more important than it was to female snaggers ($P < 0.05$). Female snaggers rated the family recreation aspect of paddlefish snagging more highly than did male snaggers ($P < 0.01$).

State of residence.—As might be expected, nonresidents were less interested in returning to Intake with less than a two-fish annual limit ($P < 0.01$). Actual harvest expectations were, however, higher for residents than nonresidents. Significantly more residents than nonresidents indicated that they felt unsuccessful if they caught only one paddlefish ($P < 0.01$). Nonresidents were more inclined toward snagging at night than were residents ($P < 0.05$), and although both residents and nonresidents tended to enjoy the people and the social environment at Intake, residents tended to enjoy it more than nonresidents ($P < 0.05$).

Nonresidents expressed greater interest than residents in the novelty and distinctiveness of paddlefishing ($P < 0.01$), in catching an unusual fish ($P < 0.01$), in the challenge or sport of paddlefishing ($P < 0.05$), in the experience and thrill of hooking a paddlefish ($P < 0.01$), in being close to the river ($P < 0.05$), and in meeting new people ($P < 0.01$).

Annual income.—Snaggers with higher incomes placed more emphasis than those with lower income on the relaxation value derived from paddlefishing ($P < 0.05$) and less emphasis on the meat value of a paddlefish ($P < 0.05$).

Education.—Neither college-educated nor high-school-educated snaggers preferred catch and release with no harvest (i.e., being photographed next to the fish rather than retaining it). However, college-educated snaggers were significantly more supportive of this release strategy than were high-school-educated snaggers ($P < 0.05$).

Discussion

The idea that paddlefish snaggers' values, attitudes, and motivations for fishing make them a distinctly different segment of Montana's anglers is not supported by this study. Numerous responses to our survey were consistent with broader, statewide surveys conducted in Montana by McFarland and Brooks (1993) of warmwater anglers and by Brooks (1991) of Montana anglers in general. For example, the McFarland and Brooks (1993) survey and our survey indicated that primary motivations for fishing were to be outdoors and to get away from routine activities (our Table 1; their Table 4). Paddlefish snaggers tended to be predominantly young and middle-aged males, employed in traditionally blue-collar occupations or unemployed (including retired), of educational level similar to Montana residents at large, and of generally low–moderate income common to eastern Montana and the region. McFarland and Brooks (1993) indicated that 46% of Montanans 18 and older (anglers and nonanglers) had at least some college education. Forty-two percent of Intake snaggers had that level of education.

For most snaggers, eating paddlefish meat was of lower priority than other aspects of the snagging experience. The novelty of the experience, the natural surroundings, and family activities all rated more highly than obtaining food. The McFarland and Brooks (1993) study reported similar results for Montana anglers in general who sought a variety of species (our Table 1; their Table 4). Although snaggers are often disparaged as meat fishers (e.g., Catchings 1985), paddlefish snaggers in this study demonstrated many of the characteristics Fedler and Ditton (1986) classified as a low- to mid-consumptive orientation. Spencer (1993) noted the importance of nonconsumptive aspects of angler satisfaction in Lake Miltona, Minnesota. Holland and Ditton (1992) reported that groups of anglers in several studies were oriented toward low- to mid-consumption. At Intake, it is not uncommon for paddlefish snaggers to give away their paddlefish meat to others.

Despite the moderate emphasis on eating fish, paddlefish snaggers were not enthusiastic about catch and release as a complete substitute for harvest. Individuals with more education were more willing to accept total catch and release than were less-educated snaggers, but neither group was in favor of it. Harvesting and eating some fish is evidently an important part of the overall fishing experience. This result also agrees with the McFarland and Brooks (1993) study on Montana anglers in general. When warmwater anglers were asked by McFarland and Brooks what restrictive regulations would be preferred if needed to increase or maintain the number of large fish in a water body, a total catch-and-release regulation was never among the top three options. A similar result was reported by Matlock et al. (1988) for Texas coastal fisheries for sciaenids (drums, including seatrout *Cynoscion* spp.), where anglers strongly opposed catch and release without a harvest option. A catch-and-release program was encouraged by many respondents at Intake and strongly supported in another survey in 1994 (Scarnecchia and Stewart 1995), but generally only in addition to, not in place of, harvest.

As expected, the paddlefish was ranked higher as a target species by snaggers than by Montana anglers in general. Whereas snaggers rated the paddlefish over largemouth bass and northern pike and on a par or preferable to cutthroat trout, paddlefish was not even on the list of the top 15 species or species groups of the Montana public in general (McFarland and Brooks 1993). Despite considerable media publicity and efforts at education through information displays and brochures, many people throughout Montana remain unfamiliar with paddlefish and snagging. Even on the Yellowstone River, the paddlefish is much less sought after than channel catfish, walleye, and sauger (Brooks 1991), perhaps in part because the paddlefish season is short (May 15–June 30), the total catch limited (annual bag limit of two fish as of 1993), the fishing gear specialized, and the fishing technique strenuous.

The low participation of women in snagging is consistent with the McFarland and Brooks (1993) result that only about a third of women in Montana fished. The percentage of people we interviewed who were women was small (9%), despite active (nonrandom) attempts to recruit them to the sample. Therefore, we did not adjust our overall results

for this nonrandomness and assumed that our overall results accurately reflected the population of active snaggers at Intake.

Age distribution of snaggers in this study was also similar to that described by McFarland and Brooks (1993). The largest group of anglers in their study was age 31–45; at Intake the modal age group was 30–39. At Intake, however, a third of the respondents were less than age 30, whereas the 18–30 age-group constituted less than 20% of anglers statewide. This result may indicate that the strenuous nature of snagging favors younger participants.

Information obtained from our survey has been used in managing the Intake fishery. In 1994, the annual bag limit was reduced from two fish to one in response to declining catch rates at Intake, increasing rates of recovery of tagged fish (Stewart 1994), and an aging paddlefish population (Scarnecchia et al. 1996).

Although the survey indicated that anglers would not, in general, be as satisfied with a limit of one fish as two fish, (Table 2, question l), results from another question (Table 2, question e) indicated that anglers were generally satisfied with retaining only one paddlefish. Our interpretation was that the opportunity to continue fishing for a second fish was more important than the capture and retention of a second fish. This interpretation was supported by requests made by snaggers during our survey. Numerous snaggers requested, both verbally and through written comments, the opportunity to continue fishing after a two-fish bag limit had been reached, even if they had to release all additional fish. During the 1994 fishing season, numerous snaggers again requested the opportunity to continue fishing (catch and release) after they had landed their limit of one fish (Scarnecchia and Stewart 1995). Our conclusion was that although complete catch and release was not favored by snaggers (Table 2, question g), a combination of a one-fish bag limit and catch and release was the most acceptable alternative.

The opportunity to release paddlefish had existed until 1981, when mandatory retention was enacted to allow more rapid turnover of snaggers in prime fishing sites (thereby reducing crowding) and to reduce high-grading (retention of larger fish and subsequent release of smaller fish previously caught). Before mandatory retention, many paddlefish were wasted as snaggers retained a large paddlefish in favor of small ones; many paddlefish were stressed or dead prior to release (Scarnecchia and Stewart 1995).

Another concern in 1995 was mortality of released fish. Although definitive studies on paddlefish mortality due to snagging have not been conducted, available evidence indicates that snagged paddlefish can be released successfully. Short-term visible effects of snagging on paddlefish are generally minimal; the hooks nearly always puncture rather than tear the fish's tough outer skin. Long-term effects of snagging are not as well understood. However, Gengerke (1978) reported that of 2,012 paddlefish snagged from the upper Mississippi River, at least 387 were known to have been later recaptured. Moen et al. (1992) found that snagged paddlefish implanted with radio transmitters generally survived to provide useful information on habitat use. These results provided strong evidence that snagged paddlefish, if released promptly and handled minimally, will often survive.

As a result, in 1995, two monitored catch-and-release periods per week were established (Wednesdays and Sundays, 1500–2100 hours). The confined area of the fishery at Intake assured that each paddlefish caught was handled and released properly, and that released fish were jaw-tagged to assess survival following snagging. Continuation of the catch-and-release program will depend on angler response, paddlefish survival rates, and overall stock status.

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