ANGLER OPINIONS REGARDING FISHING SUCCESS AND CRAPPIE REGULATIONS IN A SMALL SOUTH DAKOTA IMPOUNDMENT

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ABSTRACT

Anglers at Lake Alvin, South Dakota were interviewed during random-stratified creel surveys as part of a study designed to asses the effects of a 23-cm minimum length limit for black *Pomoxis nigromaculatus* and white *P. annularis* crappies. Anglers were asked what type of fish they were seeking, to rate their fishing success for that day (i.e., terrible, poor, average, good, or excellent), and their opinion regarding the crappie minimum length limit (i.e., in favor or opposed). In both winter and open-water seasons, the majority of anglers stated that they were fishing for anything, with crappies always being the second most common response. Angler type was divided into crappie and non-crappie anglers for within-group and between-group comparisons. Catching and harvesting at least one crappie influenced crappie angler success ratings. However, neither catch nor harvest affected crappie or non-crappie angler opinion regarding the length limit during the winter and open-water seasons. The success rating from non-crappie anglers was not dependent on catching or harvesting a crappie during the open-water season. However, non-crappie and crappie angler success ratings were similar during winter seasons. Anglers at Lake Alvin thus favored the regulation even when positive results were not evident. Therefore, anglers appear to trust the decisions of conservation agency biologists when it comes to placing regulations on South Dakota fish populations.

Keywords

Black crappie, white crappie, angler opinion, fishing success, minimum length limit

INTRODUCTION

The opinion of anglers regarding restrictive fishing regulations is important to fisheries managers. The public's perception of regulations may play an important role in whether or not a proposed regulation will be supported by anglers. An evaluation of a 254-mm minimum length limit on crappies *Pomoxis* spp. in Delaware Reservoir, Ohio found that 51% of anglers were in favor before the regulation was enacted and 74% of anglers were in favor four years

after implementation of the minimum length limit (Hale et al. 1999). During the same study, 14 to 46% of other Ohio anglers were in favor of minimum length limits.

Anglers complained about the small sizes of black crappies *P. nigromaculatus* and white crappies *P. annularis* they were catching in Lake Alvin, South Dakota. Population assessments indicated truncated size and age structures (Guy and Willis 1993). However, growth rates were moderate compared to other South Dakota crappie populations (Guy and Willis 1995). Thus, state biologists suspected that these populations were being overharvested (Knapp and St. Sauver 1995).

Prior to any regulation changes, South Dakota Department of Game, Fish, and Parks (SDGFP) biologists conducted an angler opinion survey to evaluate how receptive anglers might be to restrictive harvest regulations on crappies in Lake Alvin. Initially, anglers were asked their opinion on a 20-cm (8-in) minimum length limit. Of the anglers who responded, 91% were in favor. These initial respondents were resurveyed to assess their opinions on a 23-cm (9-in) minimum length limit; 93% of those who responded were in favor. With public support, SDGFP instituted a 23-cm (9-in) minimum length limit for black and white crappies in Lake Alvin beginning January 1, 1996. Regulation signs were posted at lake access points and the new regulation was listed in the state fishing handbook. The objectives of this study were to determine the types of fish sought by anglers, if catching or harvesting at least one crappie had an influence on how crappie and non-crappie anglers rated their fishing success, and if catching or harvesting at least one crappie had an influence on the opinions of crappie and non-crappie anglers regarding the minimum length limit.

STUDY AREA

Lake Alvin is a permanent warmwater impoundment located in southeastern South Dakota (Lincoln County) and is owned and managed by SDGFP. The lake has a surface area of 36 ha, maximum depth of 7.9 m, and mean depth of 3.4 m. Lake Alvin is a eutrophic impoundment, has a moderate level of turbidity, and contains few submerged aquatic macrophytes (Stueven and Stewart 1996). There are very few prey fish species present in the lake. Thus, the prey base available to crappies primarily consists of zooplankton and macroinvertebrates.

METHODS

Random-stratified creel surveys were conducted at Lake Alvin during both the winter season (December through February) and the open-water season (April through September). From December 1997 through September 1999, anglers were asked the following questions. What type of fish are you fishing for today? How would you rate your fishing success today: terrible, poor, average, good, or excellent? What is your opinion of the minimum length limit for crappies in this lake: in favor, highly in favor, opposed, highly opposed, or no opinion? Success and opinion questions were closed-ended to allow for easier in-

terpretation of data (Pollock et al. 1994). Responses were used to determine the percentage of anglers seeking various fish species during each season, how anglers rated their fishing success, and their opinion toward the crappie minimum length limit.

Anglers were divided into either "crappie anglers" or "non-crappie anglers" for the purpose of this analysis. Chi-square analysis (SAS 1996) was used to determine if catching or harvesting at least one crappie had an influence on angler success rating or angler opinion regarding the minimum length limit. Comparisons were made for crappie anglers between years and between winter and open-water seasons. Comparisons were also made between crappie anglers and non-crappie anglers. Length limit opinion responses were combined into favorable and unfavorable categories because the number of anglers who responded either "highly in favor" or "highly opposed" was minimal. Anglers who had "no opinion" concerning the regulation were not included in the analyses.

RESULTS

Crappies represented the most sought fish during winter seasons (Table 1). The majority of open-water anglers stated they were fishing for "anything," with crappies being the second most common response. The open-water season included more diversity in angler type and in opinion regarding the length limit (Table 2).

Harvesting and/or catching a crappie influenced how crappie anglers rated their fishing success in both open-water and winter seasons. For example,

Table 1. Types of fish sought by anglers at Lake Alvin, South Dakota during winter and open-water seasons from 1997 to 1999. The number of anglers responding (% is in parentheses) is listed for each season.

	WINTER SEASON		OPEN-WATER SEASON	
Fish sought	**1997/1998**	**1998/1999**	**1998**	**1999**
Anything	23 (28.75)	38 (40.86)	251 (44.82)	270 (63.08)
Crappie	33 (41.25)	42 (45.16)	161 (28.75)	89 (20.79)
Panfish	15 (18.75)	2 (2.15)	43 (7.67)	5 (1.16)
Game fish	9 (11.25)	8 (8.60)	30 (5.35)	0
Bass	0	0	26 (4.64)	10 (2.33)
Walleye	0	3 (3.22)	12 (2.14)	17 (3.97)
Carp	0	0	11 (1.96)	0
Bluegill	0	0	9 (1.60)	15 (3.50)
Northern pike	0	0	8 (1.42)	3 (0.70)
Catfish	0	0	4 (0.71)	10 (2.33)
Bullhead	0	0	3 (0.53)	2 (0.46)
Yellow perch	0	0	2 (0.35)	7 (1.63)

Table 2. Number of anglers (crappie and non-crappie) responding to questions asked regarding their opinion of a crappie minimum length limit and their rating of angling success during creel surveys at Lake Alvin, South Dakota separated by season, year, whether or not the angler caught a crappie, and whether or not the angler harvested a crappie. Angling success rating responses were 1 = terrible, 2 = poor, 3 = average, 4 = good, and 5 = excellent.

					LENGTH LIMIT OPINION		ANGLING SUCCESS RATING				
Angler type	Season	Year	Caught	Harvested	In favor	Opposed	1	2	3	4	5
Crappie	Winter	1997/1998	Y	-	6	0	2	10	5	6	11
			N	-	2	0	6	9	1	0	0
			-	Y	0	0	0	1	2	4	0
			-	N	8	0	8	20	4	2	1
	Open-water	1998	Y	-	93	8	15	39	25	27	8
			N	-	48	7	28	22	6	0	2
			-	Y	27	5	3	10	9	12	4
			-	N	114	10	40	49	22	15	6
	Winter	1998/1999	Y	-	39	0	4	6	15	20	0
			N	-	28	6	8	26	0	0	0
			-	Y	18	0	0	3	5	14	0
			-	N	49	6	12	29	10	6	0
	Open-water	1999	Y	-	24	8	7	12	10	9	0
			N	-	42	0	22	26	3	0	0
			-	Y	2	0	2	0	0	0	0
			-	N	64	8	27	38	13	9	0

Table 2 continued.

Angler type	Season	Year	Caught	Harvested	LENGTH LIMIT OPINION		ANGLING SUCCESS RATING				
					In favor	Opposed	1	2	3	4	5
Non-crappie	Winter	1997/1998	Y	-	0	0	2	8	7	2	0
			N	-	8	0	12	4	13	0	0
			-	Y	0	0	0	0	5	2	0
			-	N	8	0	13	12	15	0	0
	Open-water	1998	Y	-	75	0	6	33	24	3	0
			N	-	234	34	132	90	68	26	5
			-	Y	6	0	0	5	1	1	0
			-	N	310	34	139	118	91	28	5
	Winter	1998/1999	Y	-	39	2	4	14	11	14	0
			N	-	42	4	6	34	2	0	0
			-	Y	8	0	0	4	8	1	0
			-	N	68	6	15	47	7	16	0
	Open-water	1999	Y	-	58	9	7	46	26	71	3
			N	-	144	16	80	83	42	14	8
			-	Y	2	0	0	0	0	1	3
			-	N	197	24	83	125	71	23	3

during the open-water season, crappie anglers rated their fishing success significantly higher when they harvested at least one crappie (χ^2=20.2, P=0.001) (Table 3). Similarly, winter crappie anglers rated their fishing success significantly higher when they caught at least one crappie (χ^2=52.8, P=0.001).

There was no significant difference between winter crappie and non-crappie angler success rating when they did not harvest a crappie (χ^2=2.75, P=0.60), likely because most winter non-crappie anglers were seeking crappies as well as other panfish. While there was a significant difference in fishing success rating between open-water crappie and non-crappie anglers who did not catch a crappie (χ^2=20.5, P=0.001), these anglers did not necessarily have to catch a crappie to rate their success as "average" or better.

Crappie angler opinions regarding the minimum length limit were not influenced by whether or not they caught or harvested a crappie during either the open-water or winter seasons. Most anglers of all types in all seasons were in favor of the regulation (Table 4). For example, there was no significant difference in length limit opinions between crappie anglers who did or did not catch a crappie during open-water seasons (χ^2=1.44, P=0.23). There was also no significant difference in crappie angler opinions regarding the crappie minimum length limit between the 1998 and 1999 open-water seasons (χ^2=0.955, P=0.33), even though benefits of the regulation were not evident (Bister 2000). In addition, there was no significant difference between the opinions of winter and open-water crappie anglers (χ^2=0.476, P=0.49). Finally, there were no significant differences between the opinion of crappie and non-crappie anglers in either the winter (χ^2=0.08, P=0.78) or open-water (χ^2=1.16, P=0.28) seasons when asked if they favored the crappie minimum length limit.

CONCLUSIONS

Crappies were the fish species most sought by anglers at Lake Alvin. Most anglers of all types in all seasons were in favor of the crappie minimum length limit. Catching and/or harvesting a crappie influenced crappie angler success ratings. Anglers rated their fishing success higher when they either caught or harvested a crappie. Winter non-crappie anglers appeared to be similar to crappie anglers. However, open-water non-crappie anglers did not necessarily have to catch or harvest a crappie to rate their success as average or good. Winter crappie and non-crappie anglers were probably similar angler types, as evidenced by their similarity in success ratings based on catching or harvesting a crappie.

Angler opinions regarding the crappie minimum length limit were not dependent on catching or harvesting a crappie. There were no opinion differences for crappie anglers between seasons or between years. Anglers still favored the regulation even though the size structure of crappie population in the lake was not improving (Bister 2000). Therefore, anglers appear to trust the decisions of state conservation agency biologists regarding restrictive regulations on state fish populations.

Table 3. Chi-square results from angler success rating comparisons at Lake Alvin, South Dakota during creel surveys conducted from December 1997 through September 1999. Comparison groups were delineated by season, year, and whether or not they caught a crappie or whether or not they harvested a crappie. C = crappie anglers, NC = non-crappie anglers, O = open-water, and W = winter.

GROUP 1					GROUP 2						
Type	Season	Year	Caught	Harvested	Type	Season	Year	Caught	Harvested	χ^2	P
C	O	98	No	-	C	O	99	No	-	3.62	0.306
C	O	98	Yes	-	C	O	99	Yes	-	3.51	0.477
C	O	98	-	No	C	O	99	-	No	4.68	0.322
C	O	98	-	Yes	C	O	99	-	Yes	14.74	0.005
C	O	98 & 99	-	No	C	O	98 & 99	-	Yes	20.20	0.001
C	W	97/98 & 98/99	No	-	C	W	97/98 & 98/99	Yes	-	52.80	0.001
C	O	98 & 99	Yes	-	NC	O	98 & 99	Yes	-	14.77	0.005
C	O	98 & 99	-	No	NC	O	98 & 99	-	No	10.59	0.032
C	O	98 & 99	-	Yes	NC	O	98 & 99	-	Yes	5.70	0.222
C	W	97/98 & 98/99	No	-	NC	W	97/98 & 98/99	No	-	9.52	0.009
C	W	97/98 & 98/99	Yes	-	NC	W	97/98 & 98/99	Yes	-	4.07	0.396
C	W	97/98 & 98/99	-	No	NC	W	97/98 & 98/99	-	No	2.75	0.601
C	W	97/98 & 98/99	-	Yes	NC	W	97/98 & 98/99	-	Yes	11.24	0.004

Table 4. Chi-square results from angler opinion rating comparisons at Lake Alvin, South Dakota during creel surveys conducted from December 1997 through September 1999. Comparison groups were delineated by season, year, and whether or not they caught a crappie or whether or not they harvested a crappie. C = crappie anglers, NC = non-crappie anglers, O = open water, and W = winter.

GROUP 1					GROUP 2						
Type	Season	Year	Caught	Harvested	Type	Season	Year	Caught	Harvested	χ^2	P
C	O	98	No	-	C	O	99	No	-	5.76	0.016
C	O	98	Yes	-	C	O	99	Yes	-	6.69	0.010
C	O	98	-	No	C	O	99	-	No	0.50	0.476
C	O	98	-	Yes	C	O	99	-	Yes	0.37	0.545
C	O	98	[a]	[a]	C	O	99	[a]	[a]	0.96	0.330
C	O	98 & 99	No	-	C	O	98 & 99	Yes	-	1.44	0.230
C	W	97/98	No	-	C	W	98/99	No	-	0.42	0.515
C	W	97/98	-	No	C	W	98/99	-	No	0.97	0.326
C	W	97/98	[a]	[a]	C	W	98/99	[a]	[a]	0.71	0.390
C	W	97/98 & 98/99	[a]	[a]	C	O	98 & 99	[a]	[a]	0.47	0.490
C	O	98 & 99	[a]	[a]	NC	O	98 & 99	[a]	[a]	1.16	0.280
C	W	97/98 & 98/99	[a]	[a]	NC	W	97/98 & 98/99	[a]	[a]	0.08	0.780

[a] Catching or harvesting a crappie was not considered for comparison.

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