

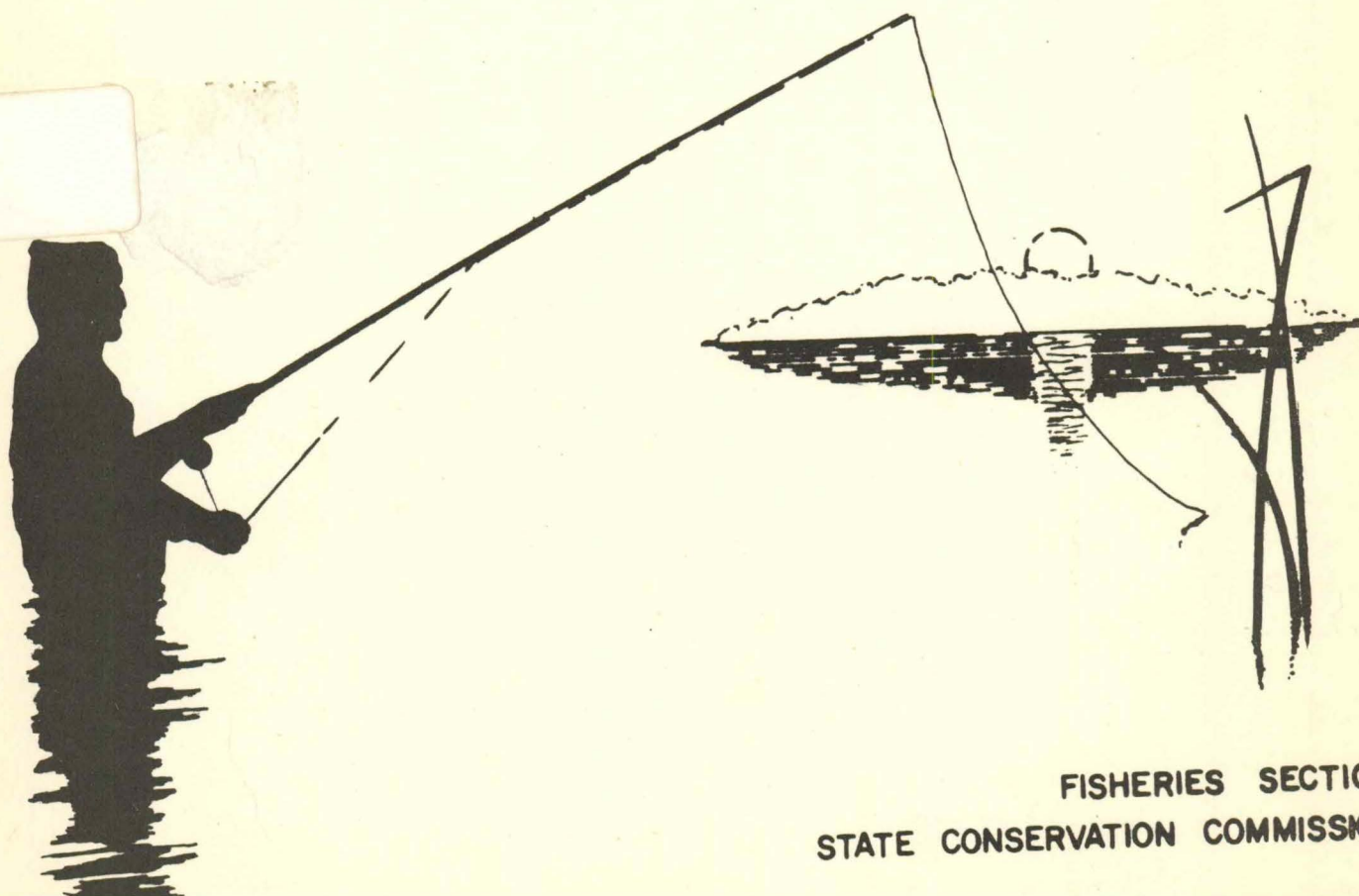
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SPORT FISHERY HARVEST AT SPIRIT LAKE , 1972 - 73

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JOB COMPLETION REPORT  
PROJECT NO. 102-3



FISHERIES SECTION  
STATE CONSERVATION COMMISSION

SPORT FISHERY HARVEST AT SPIRIT LAKE, 1972-73

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Job Completion Report  
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## SYNOPSIS

A quantitative sport fishery survey was conducted from 1 May, 1972 through 15 February, 1973. An estimated 79,164 anglers expended 208,363 hours harvesting 460,347 fish weighing 213,197 lbs. Bullhead, yellow perch and walleye dominated the sport fishery, constituting 97.4% of the catch and 92.5% of the weight. Shore, boat and winter fish harvests are discussed. A fish species preference of angler was conducted in conjunction with the fishery survey. Bullhead, yellow perch and walleye were the most frequently sought after fish species.

## INTRODUCTION

Sport fishery surveys have been conducted at Spirit Lake continuously since 1945. From 1945 through 1953 a contact survey was used, with clerks collecting data direct from anglers, boat liveries and other interested parties by personal interviews. From 1953 through 1955, only fishermen were contacted to obtain data. Since 1956, a comprehensive sub-sample survey has been used to estimate catch statistics. Previous results have been reported by Rose (Quarterly Biology Reports, Vol. I through Vol. XI), Moen (Quarterly Biology Reports, Vol. XII through Vol. XV), Jennings (Quarterly Biology Reports, Vol. XVII through Vol. XXV) and McWilliams (1972).

Spirit Lake is the largest natural lake in Iowa containing 5,680 surface acres. It is part of a chain of lakes formed by the Wisconsin glacier and is located adjacent to the Iowa-Minnesota border. The basin has gradually sloping sides, rocky shoal areas and several prominent rock reefs. Maximum depth is 24 ft. The watershed contains over 38,000 acres, including 2,609 surface acres from seven other lakes. Overflow from Spirit Lake drains into adjoining East Okoboji Lake through a man-made spillway located in the southeast corner.

The main objectives of the sport fishery survey were four-fold. First, to estimate by species the number and weight of fish caught. Second, estimate the number of fishing trips and hours expended. Third, record the ratio of tagged to untagged walleye for a population estimate. Lastly, compile a list of fish species preferred by Spirit Lake anglers.

## SURVEY METHODS AND PROCEDURES

The open water fishing season, which extended from May through November,

was surveyed from 6 AM-10 PM. The period was divided into two 8 hr intervals, 6 AM-2 PM designated A and 2 PM-10 PM designated B. Using a current yearly calendar the A or B designation was first assigned to weekdays and then to weekend days (including holidays). Days not surveyed were staggered to prevent reoccurrence of no surveys on the same days each week (Table 1).

Table 1. A tentative survey schedule for one month at Spirit Lake

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 <sup>1</sup>	2 A	3 B	4 A	5 B	6 <sup>1</sup>	7 B
8 B	9 B	10 A	11 B	12 <sup>1</sup>	13 A	14 <sup>1</sup>
15 A	16 A	17 B	18 <sup>1</sup>	19 A	20 <sup>1</sup>	21 A
22 B	23 B	24 <sup>1</sup>	25 A	26 <sup>1</sup>	27 B	28 A
29 A	30 <sup>1</sup>					

<sup>1</sup>Day not surveyed.

Bi-hourly counts of boats and shore fishermen were made each day to obtain the total number of fishing craft and shore anglers. For example, counts were made at 3, 5, 7 and 9 PM on a B survey. As many shore and boat fishermen were interviewed as possible to determine the number of anglers per party, number and weight of each species caught, number of hours expended and the fish species sought. Monthly summations were computed to estimate

catch statistics. The method of expansion and compilation used are described by Rose (1956).

The survey in the winter fishery season extended from December through mid-February. Early morning fishing pressure was light and anglers were statutorily required to leave the ice by 8 PM, so the survey period was from 9 AM-6 PM. For data compilation and expansion, the number of cars on the ice was used in place of the total number of fishing boats.

#### SPORT FISHERY SURVEY RESULTS

An estimated 79,164 anglers harvested 460,348 fish weighing 213,197 lbs during 1972-73. Anglers caught an average 2.2 fish per hour (FH) or 5.8 fish per trip (FT). Combined effort of all fishermen was 36.7 hrs per acre with a harvest of 37.5 lbs of fish per acre. Shore anglers caught 66.5% of the fish, boat anglers accounted for 27.1% and the winter fishermen 6.4%.

Shore anglers harvested over 306,000 fish with a fishing success of 3.2 FH or 6.9 FT (Table 2). Boat anglers caught nearly 125,000 fish for a fishing success of 1.4 FH or 4.5 FT. Ice anglers caught 28,981 fish at 1.3 FH or 4.6 FT. Mean trip lengths were 2.1, 3.2 and 3.4 hrs for shore, boat and winter fishermen.

#### SPECIES COMPOSITION OF THE SPORT FISHERY

The three major sport fish species taken by anglers at Spirit Lake were bullhead, yellow perch and walleye. Combined they comprised 97.4% of the numerical catch and 92.5% of the catch by weight. Numerically, bullhead made up 83.1% of the sport fishery; yellow perch, 11.7; and walleye, 2.6% (Table 3). By weight, bullhead comprised 74.1%; yellow perch, 11.8% and walleye, 6.6%. Other species recorded in the survey were northern pike,

Table 2. Sport fishery statistics at Spirit Lake, 1972-73

	Type of fishing		
	Shore	Boat	Ice
Anglers	44,757	28,075	6,332
Effort in hours	95,443	91,070	21,849
Estimated number of fish harvested	306,443	124,924	28,981
Fish per trip	6.9	4.5	4.6
Fish per hour	3.2	1.4	1.3
Mean trip length	2.1	3.2	3.4
Harvest in lbs/acre	11.1	23.7	2.7
Fishing pressure	16.0	16.8	3.8

smallmouth bass, largemouth bass, channel catfish, sheepshead, crappie and bluegill, but accounted for < 3% of the number and < 8% of the weight.

Bullhead was predominant in the open water fishery harvest. In the shore angler catch, bullhead comprised 96.2% of the numerical catch and 89.9% of the weight. Crappie and walleye ranked second and third, and contributed most of the remaining number and weight (Table 3). Of the boat angler harvest, bullhead contributed 70.3% of the catch and 58.5% of the weight. Yellow perch and walleye made up 19.9% and 6.1% of the numerical catch and 18% and 11% of the weight.

There was an expected shift in the dominant species of fish caught in the winter fishery with yellow perch constituting 94.8% of the catch and 84.5% of the weight. Walleye contributed most of the remaining numbers and weight in the winter fishery.



Table 3. Species composition of the sport fishery at Spirit Lake, 1972-73

Species	Type of fishing					
	Shore		Boat		Winter	
	Number	Weight	Number	Weight	Number	Weight
Bullhead	294,707	121,256	87,861	36,746		
Y perch	1,507	677	24,872	11,320	27,469	13,104
Walleye	3,032	5,130	7,618	6,909	1,409	2,143
Crappie	5,253	2,433	1,248	714	18	12
N pike	739	1,884	1,318	2,779	52	161
Sm bass	120	245	567	1,130	33	92
Bluegill	248	201	564	424		
C catfish	560	655	244	1,011		
Lm bass	19	53				
Sheepshead	256	655	632	1,757		
Total	306,443	134,895	124,924	62,790	28,981	15,512

#### ANGLER PREFERENCE OF FISH SPECIES

A study of the fish species preferred by Spirit Lake anglers was done in conjunction with the sport fishery survey. Of 2,108 shore anglers contacted, 86.2% preferred bullhead; 6.5%, walleye; 3.2%, yellow perch; 1.5%, crappie; and 1.2%, channel catfish (Table 4). Few fishermen sought northern pike, sheepshead or bluegill, and .2% of the anglers indicated no species preference.

Table 4. Species preference and percentage fishing success for the 1972-73 sport fishery at Spirit Lake

Species	Type of fishing					
	Shore		Boat		Winter	
	Number	% Success	Number	% Success	Number	% Success
Bullhead	1,818	98.3	468	100.0		
Y perch	67	90.0	470	94.7	601	100.0
Walleye	138	76.8	394	83.5	203	95.6
N pike	14	85.7	20	100.0		
Crappie	32	100.0	1	100.0		
C catfish	25	100.0	11	100.0		
Bluegill	2	100.0				
Sm bass			3	100.0		
Sheepshead	6	100.0				
No preference	6		3			
Total	2,108		1,370		804	

Fishing success was measured by requiring the anglers catch at least one fish of the species sought. Of the 1,818 bullhead fishermen, 98.3% were successful in catching at least one bullhead. Walleye fishermen had a relatively low success, 76.8%. Yellow perch and northern pike anglers were 90% and 85.7% successful. Anglers fishing for other species were all successful.

Yellow perch was the most frequently sought species by boat anglers. Of the 1,370 interviewed, 34.3% preferred yellow perch with 94.7% successful

(Table 4). Bullhead fishermen made up 34.2% of the total and were all successful. Walleye fishermen comprised 28.8% of the total with 83.5% successful. Of the remaining boat anglers contacted, all were successful in catching the species sought. Fishermen indicating no species preference made up .2% of the total anglers.

Winter fishermen were mostly fishing for yellow perch or walleye. Eight hundred and four anglers were interviewed with 74.8% seeking yellow perch and 25.2% walleye (Table 4). Anglers seeking yellow perch were all successful with 95.6% of the walleye fishermen catching at least one fish.

#### DISCUSSION OF THE SPORT FISHERY SURVEY

Although nearly 4,000 more anglers fished in Spirit Lake in 1972-73 than in 1971-72, there was a slight decrease in the fishing effort. Catch success in the present survey was 5.8 FT or 2.2 FH, more than double the rates in 1971-72. Harvest was 37.5 lbs/acre, which exceeded only by the 50 lbs per acre recorded in 1960-61. The increases in catch success and harvest were due mostly to the high harvest of bullhead.

Total bullhead catch was more than 358,000, about four-fold above the 10 yr average. Yellow perch and walleye catch was about one-half of the 1971-72 harvest. Yellow perch harvest of 55,840 fish was nearly equal the 10 yr average, with walleye catch about half the 10 yr average. Northern pike harvest was also down sharply, with crappie taking over as the fourth most abundant species in the fishery. The harvest of other species was nearly the same as in 1971-72.

ACKNOWLEDGEMENTS

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LITERATURE CITED

- McWilliams, R. H. 1972. Sport fishery harvest at Spirit Lake, 1971. Job Comp. Rpt. No. 72-2, State Cons. Comm., Des Moines, Iowa.
- Rose, Earl T. 1956. The quantitative creel census at Spirit Lake. Quart. Biol. Rpts., Ia. Cons. Comm., Vol. 8(2):21-30.

