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A TWO YEAR CREEL CENSUS OF
DEVILS LAKE, SAUK COUNTY

By

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by Clifford Brynildson, District Biologist, David B. Ives
and Howard S. Druckenmiller, Fish Managers

INTRODUCTION

Devils Lake, Sauk County (Fig. 1) has been managed as a two story trout lake since 1954. Approximately 15,000 - 25,000 rainbow and brown trout have been stocked in the lake annually. The continuous stocking generated great interest in fishing trout in Devils Lake but the extent of the harvest of trout was unknown. A creel census was organized to measure the harvest and this report presents the results. A two year creel census on Devils Lake covered the trout fishing seasons May 11, 1968 - Feb. 1969 and May 10, 1969 - Feb. 15, 1970.

CREEL CENSUS PROCEDURES

A creel census for Devils Lake was formulated with the assistance of Warren Churchill of the Technical Services Section of the Bureau of Research. The census was conducted 40 hours per week on a five day basis. Three week days and Saturday and Sunday were censused each week. Three eight hour schedules were rotated, thereby providing coverage of all periods of a day sometime each week. As daylight hours diminished in autumn the census was reduced to two sampling periods and eventually to one period during the ice fishing season.

Fishermen or boat counts were made every four hours by the creel census attendant. The remainder of the time was spent interviewing fishermen and recording their catch. Identification and size of non-trout species were also recorded and fin clips were noted for the marked trout and walleyes.

The results of the creel census were expanded by utilizing fishermen counts in the formula. Data collected on weekends and holidays were treated separately from the data collected on week days.

RESULTS

Most of the fishing pressure and harvest occurs between the opening of the trout fishing season in May through August (Tables 1 and 2). May was the most successful month for catching trout. June and July are generally good producers, although the trout harvest dropped dramatically from May to June 1969. By August the rainbow trout population has been reduced markedly by fishing. Brown trout, however, because of a larger stocking quota and greater wariness provide good fishing through the autumn and winter.

Most of the trout that are harvested each season are fish that were stocked the same year in early spring. The mean total length of the brown trout in 1968 and 1969 was (Tables 3 and 4) 11.2 and 11.4 inches. The rainbow trout averaged 12.1 and 12.8 inches respectively for the two fishing seasons. Some of the holdover trout ranged up to 19.0 inches. Holdover trout were caught in sufficient numbers to provide exciting fishing and a few were creel throughout the fishing season.

During April, 1968, 10,000 brown trout and 5,000 rainbow trout yearlings were stocked in Devils Lake. Projected harvest figures for brown and rainbow trout were 5,444 and 4,439. This shows excellent utilization of rainbow trout, about 80 percent, and good utilization of brown trout of at least 50 percent.

In the spring of 1969, the trout stocking quota was increased to 15,000 brown trout and 10,000 rainbow trout yearlings. The projected trout harvest in 1969 were 8,886 brown and 6,373 rainbow trout. A return of approximately 55 percent was attained for the brown trout yearlings and at least 60 percent for the rainbow trout yearlings. The reason for the poorer return of the rainbow trout in 1969 compared to 1968 is not known.

Creel census data collected on other fish species show that bluegills comprise 39 to 57 percent of the fish caught in Devils Lake. The bluegills are of very desirable size in Devils Lake, consequently they attract a lot of fishermen. Largemouth bass and yellow perch together made up less than 5 percent in 1968 and 7 percent in 1969. Many of the perch are caught through the ice. Smallmouth bass and pumpkinseeds were reported caught in 1968. None were reported in 1969. The discrepancy may be due to errors in the creel census attendants identifying the fish species correctly.

Marked walleye fingerlings - 17,000 and 19,787 walleye yearlings were stocked in Devils Lake between May 6, 1968 to October 16, 1969. Four separate plants were made - one each spring and autumn for the two years. Most of the walleyes caught by fishermen were small and returned to the lake. A small population of resident walleyes inhabit Devils Lake. A few of these large fish were caught.

Northern pike reproduce successfully in Devils Lake, although the typical spawning marsh is limited to a clone of soft stem bulrush on the west shore. Apparently Koshawago Springs a small stream that enters the lake in this vicinity provides a spawning area for the northern pike. A 23-pound northern pike was caught during the census period. The winter of 1969-70 was good for northern fishing while the winter of 1968-69 was poor.

The large northern pike population is suspected of feeding actively on the stocked trout. There are many buffer species present, however, predation on the trout is still considered to be a significant problem.

Most of the trout are caught on minnows. Other popular baits are worms, artificial lures (spinners, spoons and plugs) and mayfly nymphs. The minnows and worms are usually fished in combination with a cowbell rig. Many of the trout caught early in the fishing season are caught at night. Lanterns are frequently used to provide light. There is some speculation that the artificial light improves the trout fishing either by attracting terrestrial or aquatic insects.

The residence of the anglers contacted are presented in Tables 5 and 6. Both years the percentage of Wisconsin residents was 79 percent compared to 21 percent for non-residents. About half of the fishermen are local and live within 25 miles of Devils Lake. Fishermen from Illinois represent the next largest group. Eight states were represented in 1968 compared to 16 in 1969.

DISCUSSION

Any discussion of Devils Lake requires some comment on the unique characteristics of the lake. The basic fertility of Devils Lake is one of the lowest in southern Wisconsin. The bedrock of the surrounding hills and portions of the lake bottom is quartzite which contributes a low amount of electrolytes to the surrounding water. The water chemistry conducted in July 1945 showed that the total alkalinity was 20 ppm. On February 14, 1962 it was 19 ppm and on September 8, 1967 the total alkalinity had increased to 34 ppm. The limited number of samples warrant cautious interpretation.

The higher alkalinity in recent years is thought to reflect drainage from the surrounding shoreline. Part of the shoreline receives heavy recreation use and continued increase in the fertility can be expected. The conductance in September 1967 was 58 mmhos./cm and on November 6, 1968 - 83 mmhos/cm. The pH varies between 7.0 and 7.7.

The thermocline on August 5, 1955 extended between 17 - 30 feet; 19 - 29 feet on August 1, 1966 and 24 - 26 feet on July 10, 1967. The dissolved oxygen most summers is sufficient to maintain cold water fish species to 35 feet. Water clarity was over 30 feet on September 7, 1967. Increasing fertility may jeopardize the well oxygenated cold water.

The rooted aquatic vegetation community is dominated by two species, Anacharis canadensis and Potamogeton robbinsii. The clear water assures good penetration by sunlight and aquatic vegetation grows to depths of 10 feet or more. A limited amount of sampling for zooplankton produced specimens belonging to the genera Daphnia, Cyclops and Ceriodaphnia.

Devils Lake at present is a fairly infertile lake but this factor is offset by a very efficient foodchain that includes at least three species of forage fish - fathead minnow, spot-tail shiner and Johnny darter. Crayfish are also common. The physiography of the lake - ample depth, clarity, dissolved oxygen supply, favorable temperatures and adequate spawning grounds for most fish species combine to produce a productive and varied aquatic environment.

MANAGEMENT RECOMMENDATIONS

The trout fishery established in Devils Lake in 1954 has been a great boom to the recreational resource. The problem of high harvest early in the fishing season before the stocked trout made any substantial growth has been partially alleviated by utilizing more brown trout. The brown trout does prolong the trout fishing, however, they do not grow as rapidly as the rainbow trout.

A curfew to fishing at 11:00 p.m. would also prolong the fishing. Establishing a curfew is difficult as many people enjoying fishing during the tranquillity of the night. A stocking quota of 15,000 brown trout and 10,000 rainbow trout yearlings should continue. The creel census showed that a high return of the stocked trout occurs. A fair number of trout carryover for more than one fishing season, thereby providing some trophy fish.

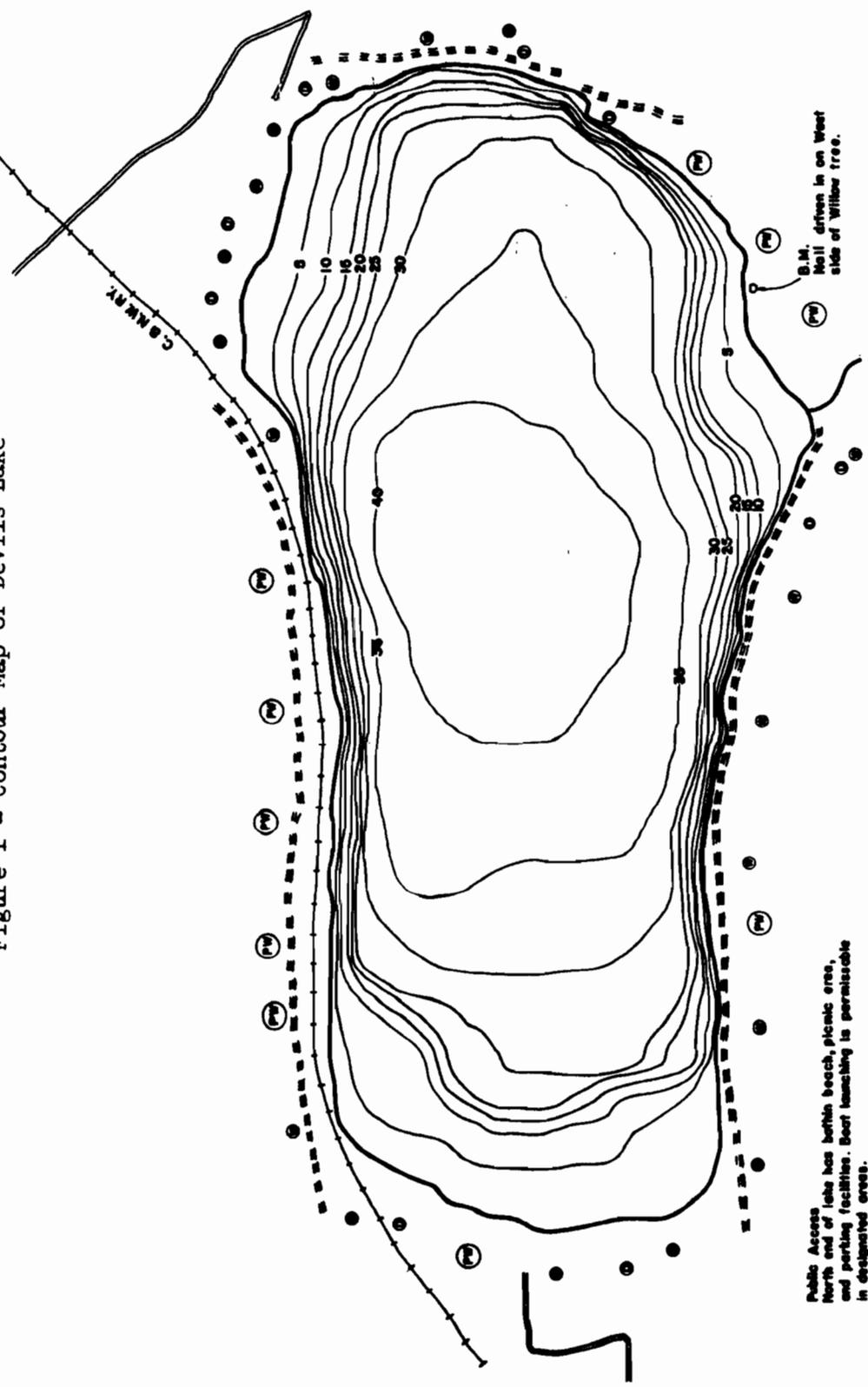
The walleye management program needs to be evaluated further. A better assessment of the growth and survival of the stocked walleyes is possible as soon as they are mature enough to congregate on the spawning grounds.

LAKE DEVILS
 SECTION 13-24-25
 TOWNSHIP 11-N
 RANGE 6-E
 TOWN BARABOO
 COUNTY SAUK

LAKE SURVEY MAP

WISCONSIN CONSERVATION DEPARTMENT

Figure 1 - Contour Map of Devils Lake



Public Access
 North end of lake has bathin beach, picnic area,
 and parking facilities. Boat launching is permissible
 in designated areas.
 South end of lake not so well developed, but has
 plenty of room for camping.

D.M. Nail driven in on West
 side of Willow tree.



AREA 377.4 Acres
 TOTAL SHORELINE 3.34 Miles
 MAX. DEPTH 40 Feet
 SCALE 1" = 500'

DATE 8/12/55
 SOURCE OF INFORMATION W.C.D.
 SOUNDINGS Echo Soundings

TABLE 1. Creel Census Results - Devils Lake, May 11, 1962 - Feb. 15, 1969

Dates	Number Fisher- men	Hours Fished	Brown Trout	Brown RB	Trout	Bluegill	IM Bass	SM Bass	Rock Bass		Y. Perch	Sfn	Crappie	N Pike	Walleve	BH	Total
									Bass	Bass							
May 11- 31	2,210	9,503	1578	2374	8301	186	0	269	248	103	176	9	0	0	30	13,260	
June	2,463	9,252	1390	1147	6698	164	14	179	137	288	62	55	0	0	14	10,142	
July	1,565	5,947	965	459	809	69	4	90	15	39	69	44	0	0	4	2,567	
August	965	2,895	721	292	2185	250	5	79	4	104	146	129	250	0	4	4,169	
Sept.	426	1,278	106	8	66	18	0	0	29	15	106	44	0	0	0	392	
October	348	1,357	292	17	0	7	0	0	0	0	24	22	0	0	0	362	
Nov. 1- Dec. 2	221	575	324	60	0	5	0	0	0	0	0	0	0	0	0	389	
Jan. 1- Feb. 15	736	2,576	68	15	15	0	0	0	270	0	0	0	0	7	0	442	
Total:	8,934	33,983	5,444	4,439	18,074	717	23	617	703	549	583	303	257	52	31,761		

Fishing Success: 0.9 fish/hr.

Avg. Hrs. Fished/Trip: 3.8

TABLE 2. Creel Census Results - Devils Lake, May 10, 1969 - Feb. 15, 1970

Dates	Number Fisher- men	Hours Fished	Brown Trout	RE Trout	Bluegill	Lil Bass	Rock Bass	V. Perch	Craopie	No. Pike	Walleye	BH	Total
May 10- 31	1,986	7,245	2,724	4,037	2,645	69	0	29	266	0	30	10	3,270
June	2,532	9,925	298	824	3,473	179	0	232	325	2	85	0	5,418
July	1,977	7,908	1,079	1,186	2,882	314	71	83	107	31	178	0	5,931
August	2,285	8,820	720	143	1,837	366	254	20	154	39	227	92	3,352
Sept.	1,240	5,084	2,078	148	1,250	156	113	16	39	59	47	0	3,906
October	813	3,341	1,115	5	442	38	0	80	6	36	10	0	1,732
November	250	1,070	418	5	0	3	0	6	0	6	0	0	438
December	188	729	93	7	5	0	0	95	0	2	5	0	207
January	656	2,690	249	13	130	0	0	302	0	34	26	0	754
Feb. 1- 15	433	2,279	112	5	56	0	0	165	2	69	11	0	420
Total:	12,360	49,691	8,886	6,373	12,720	1,125	438	1,088	899	278	619	102	32,528

Fishing Success: 0.7 fish/hr.

Avg. Hrs. Fished/Trip: 4.0

TABLE 3. Numbers and Size Data of Fish Caught in Devils Lake, May 11, 1968 - February 15, 1969

Species	Total Number	Total Length-Inches		Percent of Catch
		Average	Range	
Brown Trout	5,444	11.2	8.0 - 17.0	17.1
Rainbow Trout	4,439	12.1	9.0 - 19.0	14.0
Bluegill	18,074	6.8	4.0 - 12.0	56.9
Largemouth Bass	717	10.9	7.0 - 20.0	2.3
Smallmouth Bass	23	9.0	8.0 - 10.0	0.1
Rock Bass	617	7.0	5.0 - 8.0	1.9
Yellow Perch	703	8.0	6.0 - 11.0	2.2
Pumpkinseed	549	6.0	4.0 - 7.0	1.7
Crappie	583	8.0	6.0 - 11.0	1.8
Northern Pike	303	20.8	9.5 - 42.0	1.0
Walleye	257	10.0	7.5 - 28.0	0.8
Bullhead	52	11.8	10.0 - 16.0	0.2
Total	31,761			100.0

TABLE 4. Numbers and Size Data of Fish Caught in Devils Lake, May 10, 1969 - February 15, 1970

Species	Total Number	Total Length-Inches		Percent of Catch
		Average	Range	
Brown Trout	8,886	11.4	7.0 - 18.0	27.3
Rainbow Trout	6,373	12.8	8.0 - 18.5	19.6
Bluegill	12,720	6.2	3.0 - 11.0	39.1
L M Bass	1,125	10.3	7.0 - 22.0	3.5
Rock Bass	438	5.0	4.0 - 8.0	1.3
Yellow Perch	1,088	10.7	6.0 - 13.0	3.3
Crappie	899	7.2	5.0 - 10.0	2.8
Northern Pike	278	22.8	14.0 - 36.0	0.9
Walleye	619	9.6	5.0 - 30.0	1.9
Bullhead	102	7.6	6.0 - 11.0	0.3
Total	32,528			100.0

TABLE 5. Residence of Anglers Who Fished Devils
Lake May 11, 1968 - February 15, 1969

State	Number	Percent	Percent	
			Wisconsin	Non-Resident
Wisconsin Within 25 Miles	4,413	49.60	79.1	20.9
26-50 Miles	1,345	15.10		
51+ Miles	1,274	14.30		
Illinois	1,564	17.60		
Indiana	142	1.60		
Ohio	77	.86		
Iowa	24	.27		
Missouri	24	.27		
California	18	.21		
Texas	6	.07		
Pennsylvania	6	.07		
Total	8,934	100.0		

TABLE 6. Residence of Anglers Who Fished Devils Lake
May 10, 1969 - February 15, 1970

State	Number	Percent	Percent	
			Wisconsin	Non-Resident
Wisconsin				
Within 25 Miles	6,229	50.40	79.2	20.8
26-50 Miles	1,829	14.80		
51+ Miles	1,730	14.00		
Illinois	1,866	15.10		
Ohio	222	1.8		
Indiana	173	1.4		
Iowa	95	.77		
Missouri	64	.52		
Kentucky	28	.23		
Minnesota	28	.23		
Pennsylvania	28	.23		
Colorado	20	.16		
Kansas	16	.13		
Maryland	8	.07		
North Carolina	8	.07		
Texas	8	.07		
Michigan	3	.03		
New York	3	.03		
Oregon	2	.03		
Total	12,360	100.0		

(6/12/70)

dm