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Experiments with trap nets on Lake Winnipeg.

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INTRODUCTION

Commercial fishing on Lake Winnipeg is conducted exclusively with gill nets. To determine if another method would be feasible, a Lake Erie type trap net was used to catch cisco during the summers of 1950 and 1951 at Mukutawa River. Since this net did not appear too successful (Hewson, 1953) a modified trap net was tried at Mukutawa River and Winnipeg Beach in 1954. In 1955 four modified trap nets were used in Pigeon Bay. The main modification was a reduction of the mesh depth of leader and peaks from 30 to 18 feet.

The scientific and common names of the fish taken in these experiments as well as the symbols used in the tables are shown in Table I.

ACKNOWLEDGMENTS

Mr. L. C. Hewson directed the experiments at Mukutawa River and Winnipeg Beach and the use of this data is appreciated. Thanks are also extended to the summer student assistants who worked on the project during the 1954 and 1955 seasons.

SIZE OF FISH

Individual weights were recorded and a comparison between the weights of some fish caught in gill nets and trap nets was made (Table II). The mesh of the gill nets was $5\frac{1}{2}$ inches stretched measure.

Table I. Names of fish used in this report.

Accepted common name	Scientific name	Abbreviation
Lake sturgeon	<u>Acipenser fulvescens</u>	L.S.
Lake whitefish	<u>Coregonus clupeaformis</u>	L.W.
Cisco	<u>Leucichthys</u> spp.	C.
Quillback carpsucker	<u>Carpoides cyprinus</u>	Q.C.
White sucker	<u>Catostomus commersoni</u>	W.S.
Longnose sucker	<u>Catostomus catostomus</u>	N.S.
Redhorse sucker	<u>Moxostoma</u> spp.	R.S.
Carp	<u>Cyprinus carpio</u>	---
Channel catfish	<u>Ictalurus punctatus</u>	C.C.
Northern pike	<u>Esox lucius</u>	N.P.
Burbot	<u>Lota lota lacustris</u>	B.
Yellow perch	<u>Perca flavescens</u>	Y.P.
Yellow walleye	<u>Stizostedion vitreum vitreum</u>	Y.W.
Sauger	<u>Stizostedion canadense</u>	S.
Freshwater drum	<u>Aplodinotus grunniens</u>	F.D.

Table II. The average size of fish in pounds round weight taken in two types of fishing gear. The number of fish is shown in parenthesis.

Species	TRAP NETS		GILL NETS	
	Pigeon Bay 1955	Winnipeg Beach 1954	Mukutawa R. 1954	Mukutawa R. 1954
Burbot	1.98 (274)	4.30 (301)	2.96 (397)	3.45 (1347)
Freshwater drum	3.22 (979)	-	4.97 (105)	-
Sauger	0.59 (441)	-	0.64 (186)	-
Yellow walleye	1.12 (458)	-	1.16 (267)	1.99 (112)
Channel catfish	4.98 (251)	-	-	-
Lake whitefish	-	-	1.47 (426)	2.20 (1521)
Cisco	-	-	0.52 (918)	0.60 (575)

Burbot from Winnipeg Beach had the largest average weight when compared with burbot taken in the same or different gear at other locations. This difference may be the result of an unexploited population at Winnipeg Beach (Hewson, 1955). The average size of the burbot taken in trap nets from Mukutawa River was nearly one pound larger than those taken at Pigeon Bay. However both were smaller than those taken in gill nets. Yellow walleye and lake whitefish from the gill nets were nearly one pound larger than those from the trap nets. The average weight of the cisco was also larger from the gill nets. No comparisons can be made of freshwater drum, channel catfish or sauger as these species were seldom taken by gill nets during the trap-net experiments at either Mukutawa River or Pigeon Bay. Freshwater drum and sauger in trap nets were larger in average size at Mukutawa River than Pigeon Bay.

PIGEON BAY, 1955

Pigeon Bay was selected because a good harbour, accommodation for the field party and a fish station were nearby at the Berens River settlement. In this area there is also a yellow walleye fishery.

The four trap nets were fished from June 10 to August 30 in 24 feet of water. These nets were set in a north-south direction the following distance from the north shore: #1- $\frac{1}{2}$ mile, #2- $\frac{3}{4}$ mile, #3- $1\frac{1}{2}$ miles, #4- $1\frac{3}{4}$ miles. Table III shows the poundage taken according to individual net lifts.

Table III. Round weights of fish in pounds per lift taken at Pigeon Bay, 1955.

Net Number	F.D.	C.C.	W.S.	B.	Y.W.	S.	L.S.	O.C.	N.S.	R.S.	Y.P.	C.	Total
2	4.5	...	20.3	55.2	16.5	59.2	...	...	3.2	...	...	...	158.9
1	11.5	...	39.4	18.7	9.8	15.7	...	...	2.1	...	0.9	0.3	98.4
3,4	30.5	...	7.2	8.4	1.3	9.7	...	...	9.7	...	0.4	0.8	68.0
1,2 ^a	284.1	...	55.5	47.4	7.5	31.1	...	...	6.7	...	0.9	3.6	444.3
3,4	121.5	3.1	58.8	42.0	31.6	24.3	6.0	...	16.5	...	0	1.7	305.5
1,2	481.0	0	80.0	121.0	78.4	83.7	0	18.0	13.5	...	1.7	0	877.3
3,4	183.3	0	40.1	91.8	59.0	19.1	0	6.1	18.2	...	0	0	417.6
1,2	415.6	4.8	24.9	27.5	50.4	33.6	0	3.4	3.2	1.7	0.7	0.9	566.7
3,4	28.9	0	12.0	22.2	16.4	10.0	0	0	0	0	0	0	89.5
1,2	546.7	14.1	63.0	10.9	25.2	22.3	0	3.7	2.4	2.0	0	0.5	690.8
3,4	198.0	0	27.5	16.0	42.7	5.9	0	0	8.9	14.6	0	...	313.6
1,2	346.8	11.0	21.1	1.8	23.4	4.2	0	16.0	2.6	11.0	0	...	437.9
3,4	188.9	21.9	16.7	2.2	26.8	4.6	40.0	0	6.8	17.1	0	...	325.0
1,2	101.2	9.5	25.4	6.5	22.8	3.9	135.0	8.8	3.0	7.5	0	...	323.6
4	82.3	0	13.2	2.0	5.0	0.7	30.0	7.6	1.4	0	0.5	...	142.7
1,2,3,4	154.9	0	54.3	14.5	17.0	2.3	85.0	18.4	1.7	3.0	1.8	...	352.9
1,2	27.2	7.0	0	0	2.0	0.4	0	6.2	0	0	1.8	...	44.6
3,4	111.3	7.0	17.4	3.9	2.0	0	0	4.4	0	0	1.9	...	147.9
1,3,4	98.5	56.8	14.2	10.3	4.2	2.0	0	7.9	0	2.7	1.2	...	197.0
1,3,4	129.0	36.4	7.5	5.2	21.5	6.8	0	13.0	0	0	2.5	...	221.9
1,3	93.0	41.1	27.2	1.0	28.4	9.9	0	19.8	1.1	11.4	1.0	...	233.9
1,3,4	221.7	383.2	3.3	18.7	1.3	3.4	13.0	10.8	0	0	3.3	...	658.7
4	58.2	23.0	14.0	10.6	15.1	5.8	0	18.6	0	0	0	...	145.3
1,3	275.8	141.6	14.6	13.9	11.9	7.1	0	67.9	0	1.3	1.7	...	535.8
1,3	154.0	98.9	23.8	4.3	10.9	7.7	18.0	55.7	0	1.5	0.7	...	375.5
1,3	190.3	252.1	22.6	75.3	5.7	5.2	...	18.4	0	...	7.2	...	576.8
1,3	97.8	27.8	11.4	8.2	1.2	2.8	...	0	1.4	...	1.9	...	152.5
3	57.1	11.6	0	1.0	1.4	0	...	0	...	...	0.4	...	71.5
1	192.7	86.0	4.5	19.0	5.0	2.4	...	11.0	...	...	1.5	...	322.1
1	279.2	56.6	7.9	20.2	9.0	1.3	...	...	...	...	0	...	374.2
1	265.8	39.4	9.3	33.9	4.3	...	...	...	...	...	0.2	...	352.9

Total 5431.3 1332.9 737.1 713.6 557.7 385.1 327.0 315.7 102.4 73.8 32.2 7.8 10024.1

^aTotal includes 7.5 lbs. of lake whitefish.

Table IV has been prepared to illustrate the catch according to some standard measure of effort. It shows the poundage of fish caught on the basis of one trap net per night. One trap-net night is defined here as being one trap net lifted once every twenty-four hours. For longer periods the fish catch is divided by the number of nights the net was not lifted.

The relationship between catch per net-night and date of capture was examined by means of graphs which showed that the catch of a particular species was not constant throughout the season. Yellow walleye declined around the beginning of July. Sauger decreased until July 16, increased until July 29, then decreased again. White sucker decreased slowly throughout the season while the longnose sucker decrease was more noticeable, and very few were caught after July 7. Burbot, although abundant initially, declined during July, and increased during August. Freshwater drum remained fairly constant during June and July and increased rapidly from August 14 to August 25. Quillback carpsucker showed an increase on August 3 and then dropped to the previous steady level. A few cisco and lake whitefish were taken before June 19, however none were caught after that date. As the decline of sauger and yellow walleye became more pronounced, one trap net was placed in Patterson Bay in 18 feet of water. This set was unsatisfactory because the net became occluded with debris carried by the current. The prevalence of debris ruled out the setting of trap nets at other sites in the Pigeon Bay and Patterson Bay areas.

Table IV. The catch of fish in pounds per trap-net night at Pigeon Bay, 1955.

Date	Net		Species											Total
	Number	Nights	F.D.	C.C.	W.S.	R.	Y.W.	S.	L.S.	Q.S.	N.S.	R.S.	Y.P.	
June														
13	2	2	2.0	...	10.0	23.0	8.0	30.0	...	...	2.0	...	...	80.0
14	1	4	3.0	...	10.0	5.0	2.0	4.0	...	...	0.5	...	...	24.5
16	3,4	5	6.0	...	1.0	2.0	0.3	2.0	...	...	2.0	...	...	13.3
17 ^a	1,2	7	41.0	...	8.0	7.0	1.0	4.0	...	...	1.0	...	...	62.5
19 ^a	3,4	6	2.0	0.5	10.0	7.0	5.0	4.0	1.0	...	3.0	...	...	50.8
22	1,2	10	48.0	0	8.0	12.0	8.0	8.0	0	2.0	1.0	...	0.2	87.2
24	3,4	10	18.0	0	4.0	9.0	6.0	2.0	0	0.6	2.0	...	0	41.6
25	1,2	6	69.0	0.8	4.0	4.0	8.0	6.0	0	0.6	0.5	0.3	0	93.2
26	3,4	4	7.0	0	3.0	6.0	4.0	2.0	0	0	0	0	0	22.0
29	1,2	8	63.0	2.0	8.0	1.0	3.0	3.0	0	0.4	0.3	0.2	0	85.9
July														
1	3,4	10	20.0	0	3.0	2.0	4.0	0.6	0	0	0.8	1.0	0	31.4
2	1,2	6	58.0	2.0	4.0	0.3	4.0	0.7	0	3.0	0.4	2.0	0	74.4
4	3,4	6	31.0	4.0	3.0	0.3	4.0	0.7	7.0	0	1.0	3.0	0	54.0
5	1,2	6	17.0	2.0	4.0	1.0	4.0	0.6	24.0	1.0	0.5	1.0	0	55.1
7	4	3	27.0	0	4.0	0.7	2.0	0	10.0	2.0	0.5	0	0	46.2
10	1,2,3,4	19	8.0	0	3.0	0.8	0.9	0.1	4.0	1.0	0	0.2	0	18.0
11	1,2	2	14.0	4.0	0	0	1.0	0.2	0	3.0	0	0	0.9	23.1
13	3,4	6	19.0	1.0	3.0	0.6	0.3	0	0	0.7	0	0	0.3	24.9
16	1,3,4	11	9.0	5.0	1.0	1.0	0.3	0.1	0	0.7	0	0.2	0.1	17.4
18	1,3,4	6	20.0	6.0	1.0	0.9	4.0	1.0	0	2.0	0	0	0.4	35.3
21	1,3	6	15.0	7.0	4.0	0.1	5.0	2.0	0	3.0	0.1	2.0	0.2	38.4
26	1,3,4	18	12.0	21.0	0	1.0	0	0.1	2.0	1.0	0	0	0.3	37.4
29	4	3	19.0	8.0	5.0	4.0	5.0	1.0	0	6.0	0	0	0	48.0
31	1,3	10	28.0	14.0	1.0	1.0	1.0	0.7	0	7.0	0	0.1	0.2	53.0
August														
3	1,3	6	26.0	16.0	4.0	1.0	2.0	1.0	3.0	9.0	0	0.3	0.1	62.4
11	1,3	14	14.0	18.0	2.0	5.0	0.4	0.4	...	1.0	0	...	0.1	40.9
14	1,3	6	16.0	5.0	2.0	1.0	0.5	0.5	...	0	0.2	...	0.3	25.5
16	3	2	28.0	6.0	0	0.5	0.7	0	...	0	...	...	0.2	35.4
18	1	4	48.0	22.0	1.0	5.0	1.0	0.6	...	2.0	...	...	0.3	79.9
21	1	4	70.0	14.0	2.0	5.0	2.0	0.3	...	...	...	...	...	93.3
25	1	3	89.0	13.0	3.0	11.0	1.0	...	...	...	...	...	...	117.0

^aTotal includes 0.5 lbs. for 17th and 0.3 lbs. for 19th of Cisco.

It was noted that the catches of burbot and freshwater drum followed the same trend of being constant during the month of June, a drop during the month of July, and an increase in August. Catches of longnose sucker and sauger were similar--decreasing as the summer progressed. The total catch of all species generally remained constant from day to day. When one species declined, another increased and overall production remained the same.

The total catch and estimated value to the fisherman is listed in Table V. Channel catfish and freshwater drum, only occasionally caught in gill nets in this area, composed 67 per cent of the fish catch and 71 per cent of the value. Sauger and yellow walleye, the species mainly sought in this experiment, made up 10 per cent of the catch and nearly 25 per cent of the value. Burbot, for which there was a bounty of $1\frac{1}{2}$ per pound ~~rough~~^{round} weight, was 7 per cent of the catch and 4 per cent of the value. The remaining one per cent of the value was made up of lake whitefish and longnose sucker. The remaining 17 per cent of the catch was not marketed. It was made up of sturgeon, perch, cisco, and three species of sucker.

The estimated costs of the experiment as a commercial enterprise are shown in Table VI. These costs are minimal estimates. Casual labour will usually be hired for the original setting and for drying and cleaning of the trap nets. The costs

Table V. Evaluation of the fish catch during the Pigeon Bay trap-net experiment, 1955.

Species	Quantity in pounds round weight	Per cent of catch	Value per pound processed	Estimated value to fishermen	Per cent of value
Freshwater drum	5,431	54.0	\$.02	\$ 66.46	25.0
Channel catfish	1,333	13.0	.15	122.25	46.0
White sucker	737	7.8	a		
Burbot	714	7.0	b	10.71	4.0
Yellow walleye	558	6.0	.12	41.04	15.0
Sauger	385	4.0	.10	25.40	9.0
Lake sturgeon	327	3.0	c		
Quillback carpsucker	316	3.0	a		
Longnose sucker	102	1.0	.02	1.26	0.5
Redhorse sucker	74	0.7	a		
Yellow perch	32	0.3	a		
Cisco	8	0.1	a		
Lake whitefish	8	0.1	.22	1.22	0.5
Totals	10,025	100.0		\$268.34	100.0

^aNot marketed.

^bBounty presently paid 1½¢ per pound.

^cProtected species.

Table VI. Estimated costs of trap-net operations at Pigeon Bay, 1955, and Mukutawa River, 1954.

Items	Pigeon Bay	Mukutawa River
Wages: 2 @ \$150/month	\$ 820.	\$450.
Board and room	369.	200.
Gasoline and motor oil	64.	23.
Depreciation of trap nets	400.	100.
Depreciation of boat	50.	30.
Depreciation of motor	40.	24.
Totals	\$1,443.	\$827.

shown do not include transportation of the gear to and from the fishing grounds. The depreciation costs are based on the boat and outboard motor lasting five years when they are used three months each year. A trap net will last ten years when used an average of three months yearly.

The fishing operation by means of trap nets from June to August, 1955 in Pigeon Bay was a financial failure. The estimated value of the catch was \$268.34 while the minimal costs (\$1743.) were over six times this amount.

Although no records were kept of the gill-net fishery in this area, observations disclosed that catches of sauger and yellow walleye were small. One operator engaged in buying fish at Berens River claimed that production of these two species was one of the lowest on record.

MUKUTAWA RIVER, 1954

On June 16 one trap net was set approximately six miles west of Mukutawa River in 24 feet of water. This site was selected because a statistical study of the commercial fishery was in progress at the Mukutawa River fishing station and the personnel and facilities could aid in the trap-net experiment.

The use of gill nets among the inshore waters around Mukutawa River is hazardous as storms cause considerable damage and loss to fishing gear. The heavy twine and anchoring system

of the trap nets makes them less vulnerable to storm damage. The trap net was set in these inshore waters for the purpose of taking lake whitefish and yellow walleye. The commercial fishermen generally assume that these species occur there during the first few weeks of June, and move to deeper water as the summer progresses. Table VII records the pounds of fish taken according to individual net lifts and also the catch in pounds per trap-net night has been calculated (Table VIII). The latter table shows that the catch of lake whitefish, yellow walleye, burbot, cisco, longnose sucker and yellow perch decreased during July. Freshwater drum which did not appear in the catch until July 6, increased until July 24, then decreased until the end of fishing, July 27. White sucker and sauger increased during July. During the experiment only the freshwater drum increased to the extent where it was possible to indicate a concentration had occurred. The commercial gill nets which caught the most yellow walleye were in locations too close to shore to set a trap net. This gear requires a minimum depth of 18 feet.

The composition of the catch and the estimated value is presented (Table IX). Lake whitefish, sauger and yellow walleye, the species mainly sought, composed 25 per cent of the catch and 85 per cent of the value. Freshwater drum and longnose sucker composed 17 per cent of the catch and 5 per cent of the value. Twenty-eight per cent of the catch and the remain-

Table VII. Pounds of fish according to individual net lifts at Mukutawa River, 1954.

Date net Lifted	F.D.	W.S.	B.	Y.W.	S.	N.S.	Y.P.	C.	L.W.	Total
June										
16	...	...	76.6	42.8	11.6	29.7	2.0	17.2	34.6	214
18	...	...	172.2	51.1	0.7	52.1	0.4	22.2	41.5	340
19	...	3.5	128.2	5.6	2.0	0	2.6	89.7	34.7	266
20	...	0	59.5	4.9	1.1	0	2.1	47.7	26.3	142
21	...	8.5	69.3	3.2	2.0	0	0.5	24.5	14.8	123.
22	...	0	33.2	3.3	0.5	0	1.2	48.7	47.4	134
23	...	0.9	72.1	5.5	1.9	0	2.9	68.0	48.6	200
25	...	2.2	81.0	8.1	2.3	0	2.1	90.6	54.2	240
28	...	0	138.2	23.1	6.0	42.6	5.7	135.0	106.7	457
July										
1	...	4.5	153.0	13.2	0	0	4.0	105.9	30.5	311
2	...	7.3	47.3	21.9	18.9	0	0.9	95.0	18.6	210
3	...	8.1	25.0	15.2	1.1	0	0	33.7	12.4	96
4	...	7.0	19.3	34.9	12.3	0	1.6	50.0	11.5	137
6	17.6	11.9	23.3	14.8	9.3	0	5.0	80.0	40.3	202
7	0	0	0	6.2	4.7	0	1.2	3.8	7.8	24
8	7.6	12.5	2.4	12.5	9.0	0	1.4	9.5	43.3	98
13	21.7	26.8	48.7	9.1	0.8	0	1.2	61.7	45.1	215
14	2.8	4.7	0	0	0.7	0	0.3	7.9	0	16
18	44.0	2.9	15.0	25.1	6.0	27.2	1.7	47.0	7.5	176
20	54.8	3.2	6.5	4.1	9.4	14.7	0	29.4	7.7	130
24	315.1	14.0	8.9	2.8	20.7	9.1	2.5	11.5	11.7	396
26	42.9	2.3	...	2.2	6.1	...	2.0	2.6	1.1	59
27	16.3	5.4	...	...	0.6	...	...	0.9	0.6	24
Totals	522.8	125.7	1179.7	309.7	127.7	175.4	41.3	1082.5	646.9	4212

Table VIII. The catch of fish in pounds per trap-net night at Mukutawa River, 1954.

Date lifted	Number of net nights	F.D.	W.S.	B.	Y.W.	S.	N.S.	Y.P.	C.	L.W.	Totals
June											
16	1	...	...	77.0	43.0	12.0	30.0	2.0	17.0	35.0	216
18	2	...	...	86.0	26.0	0.7	26.0	0.2	11.0	21.0	171
19	1	...	4.0	128.0	6.0	2.0	C	3.0	90.0	35.0	268
20	1	...	0	67.0	5.0	1.0	0	2.0	48.0	26.0	142
21	1	...	8.0	69.0	3.0	2.0	0	0.5	24.0	15.0	122
22	1	...	0	33.0	3.0	0.5	0	1.0	49.0	47.0	134
23	1	...	0.9	72.0	6.0	2.0	C	3.0	68.0	49.0	201
25	2	...	1.0	40.0	4.0	1.0	0	1.0	45.0	26.0	118
28	3	...	0	46.0	8.0	2.0	14.0	2.0	45.0	36.0	153
July											
1	3	...	2.0	51.0	4.0	0	0	1.0	35.0	10.0	103
2	1	...	7.0	47.0	22.0	19.0	0	1.0	95.0	19.0	210
3	1	...	8.0	25.0	15.0	1.0	0	0	34.0	12.0	95
4	1	...	7.0	19.0	35.0	12.0	0	2.0	50.0	12.0	137
6	2	9.0	6.0	12.0	7.0	5.0	J	3.0	43.0	20.0	102
7	1	0	0	0	6.0	5.0	0	1.0	4.0	8.0	24
8	1	8.0	12.0	2.0	12.0	9.0	0	1.0	10.0	43.0	97
13	5	4.0	5.0	10.0	2.0	0	0	0.2	12.0	9.0	42
14	1	3.0	5.0	0	0	1.0	0	0.3	8.0	0	17
18	4	11.0	0.7	4.0	6.0	1.0	7.0	0.4	12.0	2.0	44
20	2	27.0	2.0	3.0	2.0	5.0	7.0	0	15.0	4.0	65
24	4	79.0	4.0	2.0	0.7	4.0	2.0	0.7	3.0	3.0	93
26	2	21.0	12.0	...	1.0	3.0	...	1.0	1.0	0.5	40
27	1	16.0	5.0	...	...	1.0	...	...	0.9	0.6	24
Total											2621

Table IX. Evaluation of the fish catch during the Mukutawa River trap-net experiment, 1954.

Species	Quantity in pounds round weight	Per cent of catch	Value per pound processed	Estimated value to fisherman	Per cent of value
Burbot	1179.7	28	\$ a	\$ 17.69	10
Cisco	1082.5	26	b		
Lake whitefish	646.9	15	.22	114.18	67
Freshwater drum	522.8	13	.02	6.39	4
Yellow walleye	309.7	7	.12	22.80	13
Longnose sucker	175.4	4	.02	2.16	1
Sauger	127.7	3	.10	8.02	5
White sucker	125.7	3	b		
Yellow perch	41.3	1	b		
Totals	4211.7	100		\$171.24	100

a Bounty of 1 1/2¢

b Not marketed

ing 10 per cent of the value was composed of burbot, on which a 1½¢ per pound bounty was paid. Of the remaining catch, 26 per cent was cisco, 3 per cent white sucker and 1 per cent perch.

The Mukutawa River trap-net experiment was a financial failure. Value of the fish catch was \$171.24, while expenses (\$827.) were over four times this amount as shown in Table VI.

Data are presented in Table X to compare the catch in gill nets with our trap net catches during the 1954 summer lake whitefish season. The gill nets were fished in a selected area, locally called Tomesters Hole, which was near the position of the trap net. A total of 10 operators fished 656,345 yards of gill net to take 48,279 pounds of fish. This represents an average of 337 pounds of fish for each operator, who used an average of 4,590 yards of gill net per day. Comparing June and July catches, the availability of all species except cisco remained similar or declined.

Table XI compares the availability of nine species of fish in the two types of gear. It is evident that these gill nets are particularly efficient in taking lake whitefish; only 486 yards of gill net captured as much as one trap net. In this instance the gill-net fishermen would require ten trap nets in place of the usual amount of gill nets. Trap nets were particularly effective in taking burbot, the average catch being equivalent to 1,661 yards of gill net. Trap nets exploited freshwater drum, which appeared in negligible numbers in the gill net catch. Marketable fish made up 51 per cent of the gill-net catch, while from the trap net they comprised 38 per cent.

Table X. The commercial gill-net catch and availability (pounds/100 yds.) in the vicinity of Mukutawa River, 1954.

Date	No. of boats	Yards of net	L.W.	Y.W.	S.	C.	Y.P.	W.S. N.S.	B.	N.P.	Total	Availability
June												
16	10	56640	2060	285	91	39	26	951	417	35	3884	6.8
17	10	33240	968	285	33	32	1	585	277	25	2206	6.6
18	10	46920	1034	476	86	133	27	648	1243	48	3695	8.6
19	8	42720	1142	170	57	300	1	486	624	39	2919	6.5
20	6	19800	907	137	12	136	4	195	209	0	1600	8.0
21	6	29640	1390	287	29	456	1	353	351	5	2872	9.6
22	7	42360	1759	67	11	201	1	253	584	0	2876	6.7
23	8	29760	858	134	38	151	9	112	432	7	1741	5.8
24	8	35520	1363	136	34	490	2	431	536	0	2992	8.4
25	7	39640	1449	190	42	326	40	514	493	0	3054	7.6
26	5	15480	382	137	19	117	0	94	507	0	1256	8.1
27	4	18480	374	122	39	290	1	76	116	0	1018	5.5
28	7	34800	719	190	69	1015	7	263	2135	7	4405	12.6
30	1	480	8	2	0	0	0	0	18	0	28	5.8
July												
1	2	9680	340	119	19	120	3	100	929	2	1629	16.8
2	3	16800	682	49	10	105	2	130	208	0	1186	7.0
3	2	10080	378	17	2	29	0	33	128	0	587	5.8
4	2	10080	391	19	1	47	0	60	210	0	728	7.2
5	4	21360	682	28	3	140	0	63	239	0	1155	5.4
6	4	17160	587	11	7	95	2	16	301	0	1019	5.9
7	3	11520	309	20	7	43	0	32	19	0	430	3.7
8	4	20640	577	35	19	77	1	124	85	0	918	4.4
9	3	15360	143	7	21	162	7	32	36	2	410	2.6
10	3	12000	360	21	24	142	3	85	83	10	728	6.0
11	1	3840	60	5	20	50	0	0	0	0	135	3.5
13	1	5280	435	12	9	300	0	50	182	0	988	18.7
14	2	4350	229	26	13	1	9	100	12	0	390	8.9
15	4	24210	540	13	46	220	0	120	203	3	1145	4.7
16	3	9150	415	10	9	525	0	10	94	0	1063	11.7
18	1	6450	204	5	11	50	0	150	414	0	834	12.9
19	2	3375	65	4	14	35	2	35	3	0	158	4.6
20	2	9330	0	0	0	10	0	320	0	0	330	3.5
Total	143	656345	20810	2999	795	5837	146	6421	11088	183		
<u>Availability</u>												
June			3.23	.58	.12	.82	.02	1.11	1.78	.03		
July			3.03	.19	.11	1.02	.01	.69	1.49	.01		

Table XI. The comparison of catch in pounds per night of gill nets and trap net in the vicinity of Mukutawa River, 1954.

Species	One trap net	100 yards gill net	No. yards of gill net equivalent to one trap net	No. of trap nets equivalent to gill nets
Lake whitefish	15.40	3.17	486	9.4
Yellow walleye	7.37	.46	1602	2.9
Sauger	3.04	.12	2533	1.8
Yellow perch	.98	.02	4900	0.9
Freshwater drum	12.44	0	0	
Cisco	25.77	.89	2895	1.6
Sucker	7.16	.98	731	6.3
Northern pike	0	.03	0	
Burbot	28.08	1.69	1661	2.8

WINNIPEG BEACH, 1954

On October 12 one trap net was set one mile northeast of Winnipeg Beach, in 18 feet of water. The purpose was to capture sauger and yellow walleye. Winnipeg Beach was selected over other sites because of its proximity to Winnipeg whereby station personnel could drive out by truck in a short time and lift the trap net.

Only the pounds of burbot taken in the trap net have been recorded in Table XII as they comprised over 99 per cent of the catch. The poundage of other species caught was as follows: white sucker, 38; yellow walleye, 13; lake whitefish, 7; quillback carpsucker, 7; redhorse sucker, 6 and carp, 1. Observations of gill net catches in this area at this time showed that very few commercial fish were being taken, and burbot were rarely caught. Surprise was expressed by some of the gill-net fishermen that burbot could be taken in such quantity and sizes. The catch of burbot in pounds per net night fell to 162 in lift number 8, although this was the largest amount of burbot taken in one lift. There is a possibility that the maximum amount of fish a trap net will hold is approximately 1300 pounds. After the maximum amount is reached, escapes are high if the net is not cleared for several days. The value of the catch was negligible as no bounty is paid in this area of Lake Winnipeg.

Table XII. Catch of burbot at Winnipeg Beach from October 12 to November 12, 1954.

Trap net lift no.	Pounds per lift	No. of net nights	Pounds per net night
1	751	2	375
2	919	4	230
3	409	1	409
4	1164	2	582
5	352	1	352
6	960	4	240
7	332	1	332
8	1300	8	162

DISCUSSION

Trap nets as commercial gear

The trap-net experiments were conducted so as to simulate a commercial operation. They therefore provided an indication of the feasibility of trap nets as an additional method of commercial fishing on Lake Winnipeg.

The nets were operated under two different situations: during the summer lake whitefish and yellow walleye season at two stations in the northern portion of the lake and during the fall yellow walleye season in the southern portion. Under these circumstances the experiments operated without a profit.

Several considerations suggest that their performance was in fact not as discouraging as the profit analysis would indicate. It is consequently not possible to decide that this result still would be obtained if trap nets were used as a commercial gear.

The first consideration is that the experiments were not conducted in the most suitable waters which however can only be located by a trial and error method. These experiments tend to eliminate the east shore of the northern portion of the lake. The west shore of this region may offer better fishing as the main deterrent to gill-net fishing there does not apply so strongly. The following section mentions that rough fish are less of a problem in trap nets.

The commercial fish catch in general was not too good during the experiment. The profit analysis may not have been a fair one to pursue since gill nets at that time might also have been operating at a loss. The best test of the trap net would have been a comparison of simultaneous catches in gill nets and trap nets. This design was unfortunately not followed but a comparison, in one instance, between commercial gill nets and the trap net was available. This has been discussed. Other characteristics between the two kinds of gear are presented later.

The trap nets may not have been fished at their highest efficiency. The gear was new to the operating personnel and new ideas and methods doubtlessly would be found with more experience so as to make the trap nets more effective.

The profit analysis for the trap net has been carried out on the basis of a market developed for a gill-net fishery. In the Great Lakes fish from trap nets frequently command a higher price than gill-net fish, owing to their better quality. Trap nets could be responsible for creating a market for species that are now not normally marketed in volume. If a better supply of channel catfish and freshwater drum could be expected then the price for them would possibly rise.

Thus while the trap-net experiment did not appear successful from the profit viewpoint there are several considerations which mitigate this conclusion. At this time however as an additional gear on Lake Winnipeg, they have a discouraging prospect.

Gill nets and trap nets

Gill nets and trap nets may be compared as to their suitability for catching whitefish during the Lake Winnipeg summer season. Their characteristics for this purpose are compared in Table XIII.

The initial cost of gill nets would be approximately \$2000. One trap net complete with anchors costs \$1000. However, it took nearly 10 trap nets to equal the catch of lake whitefish from the gill nets (cf. Page 16). The initial cost of trap nets would therefore be \$10,000, considerably higher than gill nets.

Depreciation of gill nets has been estimated at \$600. per summer season. This is for normal wear. Trap nets have been estimated to last ten to fifteen years when used two months each season. Depreciation on ten nets would amount to \$600. per year, similar to gill nets.

When engaged in gill-net fishing costs are higher than the equivalent effort using trap nets. A four man crew lifted an average of 4,590 yards of gill net per day. An equivalent 10 trap nets, once in the water could be operated by a two man crew. Handling the trap nets for drying and storage would probably require casual labor for a few days each season.

Gill nets are highly mobile when compared with trap nets, being movable from day to day if required. Trap nets, because of their bulk, are designed to be fished in the same location for a longer period.

Table XIII. Some characteristics of two types of gear.

Characteristic	Gill net	Trap net
Initial cost	lower	higher
Depreciation	same	same
Liability to loss	higher	lower
Labor operating cost	higher	lower
Mobility	higher	lower
Quality of fish	lower	higher
Rough fish problem	higher	lower
Variety of species	less	more
Knowledge of gear	higher	lower

Trap nets are harder to handle on land for purposes of drying, mending and tarring, but because of the heavy coat of preservative tar can remain in the water 6 to 8 weeks without removal for drying. Gill nets are easier to handle on land. Those not entirely made of nylon are usually dried once a week during the summer fishing season.

Trap-net caught fish are of a better quality. They are not marked by the gear and as the catch is retained alive until landed are not affected by adverse weather. Undersize or protected species may be returned to the water unharmed when taken in trap nets.

Unmarketable or rough fish are not the problem in trap nets as they are in gill nets. Gilled fish must be taken from the nets by hand and is a time consuming job. With trap nets, all the fish are scooped out with dip nets, to be sorted on land. Experience has shown that 1000 to 1500 pounds of fish can be cleared in less than an hour.

Freshwater drum and catfish were taken in commercial quantity from the trap net, whereas few of these species were taken in the same area from gill nets. Some possibility exists to develop a market for these species. Burbot, which were taken in large numbers using trap nets at Winnipeg Beach, could be used as food for domestic fur bearing animals.

The majority of fishermen on Lake Winnipeg are well experienced in the use of gill nets. If trap nets were used they would be required to learn an entirely different method of fishing.

SUMMARY

1. Experimental trap nets were used in three different locations in two successive years.
2. Samples of fish from the same location were of a smaller average size in trap nets than in gill nets.
3. Burbot, freshwater drum and catfish made up a considerable percentage by weight of the species caught in the trap nets.
4. Forty-six per cent of the fish taken during the trap-net experiment were marketable.
5. The trap-net experiment, when operated as a commercial venture, would not have been a financial success but several considerations may be partly responsible for this.
6. The characteristics of gill nets and trap nets are compared.

REFERENCES

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EXPERIMENTAL

Experimental fish were used in three different locations in two consecutive years.

Samples of fish from the same location were of a smaller average size in trap nets than in gill nets.

Surveys, freshwater drum, and other species were made up a considerable percentage by weight of the species caught in the trap nets.

Four-six of the fish in the trap nets were small, the largest experiment were marked.

The first and second years of the experiment were marked as follows: The first and second years were marked as follows:

Financial success and the venture would not be successful.

Several other factors in the experiment were marked as follows:

The characteristics of the fish and their behavior were marked as follows:

RESULTS

The results of the experiment were as follows: The results of the experiment were as follows:

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