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A CREEL CENSUS OF
EIGHTEEN METROPOLITAN LAKES

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A CREEL CENSUS
of
EIGHTEEN METROPOLITAN LAKES
by
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ABSTRACT

An extensive creel census conducted on eighteen metropolitan lakes during the summer and fall of 1974 showed that these lakes are fished mostly by people living in the counties where the lakes are located, with over 99% of the people traveling less than twenty-five miles to fish on any particular lake. By age group, approximately 42% of those fishing were 15 years old and younger, while another 8% were 65 and older.

Annual fishing pressure was estimated to be 135,300 man-hours:- 45,000 man-hours on nine Ramsey County Lakes (1,292 acres), and 90,300 man-hours on nine Minneapolis Lakes (1,384 acres). The fishing pressure ranged from a high of 459.63 man-hours per acre on Brownie Lake to a low of 12.04 man-hours per acre on Island Lake.

The estimated harvest on the Minneapolis Lakes was 105,385 fish weighing 29,938.8 lbs. (21.63 lbs. per acre); while the estimated harvest on the Ramsey County Lakes was 20,699 fish weighing 8,313.4 lbs. (6.43 lbs. per acre). The harvest ranged from a high of 120.27 lbs. per acre on Brownie Lake to a low of .52 lbs. per acre on Island Lake.

Still fishing was the most popular method of fishing on both groups of lakes, and natural bait was the most frequently used bait or lure on both groups of lakes. More fishing occurs from shore than from boats on city lakes. Properly installed fishing piers are very popular fishing spots.

Bluegills, crappies and pumpkinseeds made up 91.20 percent of the fish caught on Minneapolis Lakes, while the same species comprised 72.32 percent of the fish caught on the Ramsey County Lakes.

Sailboating was the most popular non-fishing recreational activity censused on the Minneapolis Lakes, while speed boating was the most popular non-fishing activity on Ramsey County Lakes.

With the exception of certain months, fishing is the most popular recreational activity censused on all lakes surveyed during the census.

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INTRODUCTION

This paper describes the results of the first extensive creel census conducted on lakes within the Twin Cities. The main purpose of the census was to gather data which could be used to determine fishing pressure and success on lakes within the city. The creel census can be used to determine the affect of management programs implemented on the lakes censused, or other changes in use which may occur in the future. The Twin Cities, or Metro Creel Census, when compared to statewide creel census data indicated how good fishing is on city lakes opposed to outstate lakes, and whether city lakes are subjected to more or less pressure than lakes outside the city. Another purpose of the Metro Creel Census was to gather data on non-fishing recreational use. This information indicates the relative importance of fishing as compared to canoeing, sailboating, water skiing and pleasure boating. Activities including swimming, sunbathing, or picnicing on the shore were not censused.

Various types of creel censuses have been part of fisheries management since the 1930's. The most desirable type of census is the complete or total creel census. The cost of such a census is prohibitive for most investigations, therefore, the whole must be judged on the basis of partial coverage. Because of this, biologists, statisticians, and others have developed reliable sampling procedures which are used to obtain accurate estimates of fishing pressure and other parameters. These methods are usually called partial or incomplete creel censuses.

The Metro Creel Census is an incomplete or partial type of creel census, with the original procedure being developed by Best and Boles (1956). The procedure was modified slightly and used on a creel census conducted on the Mississippi River (Daley and Skrypek, 1964). Several years later some minor changes were made by Hawkinson and Krosch (1972) for use on the current statewide creel census program. Other statewide creel censuses were conducted in Minnesota in 1953-1955 (Moyle and Franklin, 1955), 1956-1958 (Johnson, 1957), and on a less extensive basis from 1959-1961. These earlier creel censuses were also partial or incomplete type censuses with the sampling procedure and calculations being slightly different than those used in the Metro Creel Census.

CREEL CENSUS METHODS

Selection of Lakes:

Nine Minneapolis and nine St. Paul area lakes were included in the census. The lakes to be censused were chosen by the area fisheries manager. In choosing the lakes, the following factors were considered: 1) Special management practices to be implemented in the future; 2) The amount of shoreline in public ownership; 3) Representativeness of a lake to others in the Twin Cities; 4) Proximity to the other lakes being censused; 5) Known fishing potential; 6) Special regulations in effect.

A lake was chosen because it fit one or more of the above factors and not only because of good fishing. The names, identification numbers, county, township, range, section and acreage of the lakes selected for the census are as follows:

<u>Lake</u>	<u>ID. Number</u>	<u>County</u>	<u>Township</u>	<u>Range</u>	<u>Sections</u>	<u>Acres</u>
Wirth	27-37	Hennepin	29	24	SW20	38.1
Brownie	27-38	"	29	24	WC29	10.2
Cedar	27-39	"	29	24	29,32	167.8
Lake of the Isles	27-40	"	29	24	32,33	109.0
Calhoun	27-31	"	28,29	24	4,5;32,33	447.01
Harriet	27-16	"	28	24	8,9,16,17	344.8
Nokomis	27-1	"	28	24	13,14,23,24	203.6
Hiaawatha	27-18	"	28	24	12,13	53.5
Powderhorn	27-14	"	28	24	2	10.3
Island	62-75	Ramsey	30	23	26	56.3
Johanna	62-78	"	30	23	33,34	200.46
Josephine	62-57	"	29,30	23	3;34	118.0
Loeb	None	"	29	23	24,25	9.4
Long	62-67	"	30	23	17,18,20	176.8
Owasso	62-56	"	29,30	23	1,2;35,36	349.0
Phalen	62-13	"	29	22	16,21	188.5
Snail	62-73	"	30	23	23,24	158.2
Twin	62-39	"	30	22	31,32	35.5

Most of the shoreline on Hennepin County Lakes selected is controlled by the Minneapolis Park Board. There are no outboard motors allowed unless a special permit is purchased from the Park Board. This also holds true for electric motors. The shoreline on these particular lakes is completely owned by the Minneapolis Park Board, with the exceptions of Cedar Lake where the shoreline is approximately fifty percent Park owned. The Ramsey County Lakes have a much lower percentage of public shoreline. The exceptions being Loeb Lake and Lake Phalen where all or most of the shoreline is under control of the City of St. Paul Parks and Recreation Division. Island Lake has less than fifty percent of its shoreline under the control of the Ramsey County Park and Recreation Division, while Lake Josephine and Lake Johanna have approximately twenty-five percent of the shoreline controlled by this agency. Most of the remaining lakes have a lesser percent under public control. What public land exists usually forms the access site and/or swimming beach. Twin Lake has no public access or shoreline. There are no restrictions on outboard motors on most Ramsey County Lakes. Lake Phalen and Loeb Lake are the exceptions where neither outboard nor electric motors are permitted.

Work Schedule:

There were two census clerks employed for this creel census. Each clerk worked an eight-hour day, five-day, forty hour week, with two consecutive days off. Each weekend day and holiday was censused, and the days off were scheduled so that all days of the week were censused during each month. The census clerks came into the office on a different week day during each work week to fill out the necessary creel census forms. The time the clerks started working on any particular day was selected randomly and varied from 6:00 A.M. to 2:00 P.M. During the month of October, the starting times were between 6:00 A.M. and 12:00 noon. The change was made because it became too dark to make instantaneous counts if one started at 1:00 P.M. or 2:00 P.M. and then worked a normal eight-hour shift.

Sampling Methods:

The two clerks were separated so that at any particular time one clerk was census-

ing the Hennepin County Lakes, while the other clerk was censusing the Ramsey County Lakes. At the end of each work week, the clerks would exchange censusing duties, which permitted each clerk to spend an equal amount of time on each group of lakes. The clerks were required to spend one hour, including driving time, on each lake. This allowed each clerk to census eight lakes per day. Since there were nine lakes in each county, one lake was not censused each day. To determine which lake was not censused, the lakes in each county were numbered one through nine. On day one, the clerk began on lake number one, so lake number nine was not censused; on day two, the clerk started on lake number nine, thus lake number eight was not censused, etc. This rotation system was continued throughout the census and eliminated the possibility of a lake consistently being censused during early or late hours of a day.

At each visit to a lake, the clerks would make instantaneous counts of all shore anglers, fishing boats and boat anglers, runabouts, water skiers, sailboats and canoes which were present. This data was then recorded on the rough data sheet. Any person or craft which entered the area after the instantaneous count had been made was not counted, and any person or craft that had been counted but left before the count was completed was not subtracted. After the instantaneous count, the clerks would then interview as many anglers as possible and still have enough time to reach the next lake before the beginning of the hour. For each angler interviewed, the following information was obtained and recorded on the rough data sheet:-- whether the trip was complete or not, time of the interview, time the angler started fishing, type of fishing, method of fishing, fishing lure or bait, species sought, number and species of fish caught, weight of species caught, residency, age, sex, hometown. The information from the instantaneous counts was then transferred to Form A, and the information obtained from the interviews was transferred to Form B on the day that the clerk was in the office.

Calculations:

The estimated number of man-hours spent fishing (fishing pressure), the number of fish caught per man-hour (fishing success), and the estimated hours spent canoeing, sailboating, pleasure boating and water skiing, are the parameters measured.

Fishing pressure and recreational activity estimates:--
The formula used is:

$$\frac{\text{Total number of anglers counted}}{\text{number of counts}} \times \frac{\text{fishing hours in the period}}{\text{the period}} = \frac{\text{man-hours in the period}}{\text{the period}}$$

The method of calculation assumes that conditions observed on a lake at the time of an instantaneous count are representative of conditions on that lake for one hour. Each fisherman counted then represents one man-hour and can be expressed as such. If the counts are made at random times each day throughout the period, the average of those counts can be considered representative of conditions during any hours. Multiplying the average count by the number of fishing hours in a period gives an estimate of the number of man-hours during that period on that lake. It is assumed that the number of fishing hours and recreational activity hours is equal to the number of daylight hours. Use of the flexible starting times (between 6:00 A.M. and 2:00 P.M.) enabled the clerks to sample all fishing hours without working more than eight hours per day (Hawkinson and Krosch, 1972).

The same formula was used in determining estimates of recreational pressure other than fishing. The resulting estimates for all activities, except water skiing and fishing, are expressed as sailboat hours, canoe hours and runabout hours. To express

these estimates as man-hours, the average number of people for each craft is needed. The actual number of people engaged in water skiing and fishing were counted, which allowed the pressure estimates to be expressed in man-hours.

Fishing Success:

Fishing success is measured by the catch per unit of effort expended and can be described as the ratio of the number or pounds of fish caught over the number of hours spent fishing. There are two types of catch ratios which can be computed. The overall catch ratio is the total number of all species caught divided by the total hours spent fishing. This catch rate was used in making estimates of harvest. A catch ratio of less than .005 fish per man-hour and equal to or greater than .001 fish per man-hour was recorded as a trace (tr.). Any catch ratio or harvest less than .001 was considered zero. The catch ratio for selected species was also calculated. It was computed by dividing the number of a particular species caught by anglers seeking that species by the number of man-hours spent fishing for that particular species. This figure gives a better indication of how good fishing is for a particular species as it eliminates the people who were fishing for other species and may have been using gear, methods, and lures or bait not suited for catching the species being considered (Hawkinson and Krosch, 1972).

Harvest:

Harvest is defined as number or pounds of fish removed per time period from a particular fishery. It is calculated as follows:

1. (Estimated man-hours fishing)X(overall catch rate) = estimated number of fish for the period
2. (Estimated number of fish)X(average weight) = estimated pounds for the period
3. (Estimated pounds) ÷ (lake acreage) = pounds per acre per period

Harvest can be calculated for each species and all species combined for the whole census period and for smaller periods of time.

Fishing pressure, non-fishing recreational pressure, fishing success and harvest were stratified by weekend days, holidays and week days. Separate calculations were then made, and the two answers added together to provide the final answers.

RESULTS

The census started on May 18, 1974, and continued on all lakes through September 30, 1974. At this point lakes exhibiting little or no pressure (fishing and/or non-fishing) were eliminated. Censusing was discontinued on nine lakes at the end of September, and the remaining nine lakes were censused through October. Lakes dropped from the census were Island, Josephine, Loeb, Wirth, Brownie, Lake of the Isles, Nokomis, Powderhorn and Twin. Only one clerk was required to census the remaining lakes. During the entire census, 1,167 anglers were interviewed on the Ramsey County Lakes, and 2,458 anglers were interviewed on the Minneapolis Park Board Lakes.

Characteristics of the People Fishing:

Data on age and sex of all anglers interviewed was recorded. The age group distribution as shown in Tables 1 and 2 is based on similar groupings which appear in 1965 and 1970 "National Survey of Fishing and Hunting" surveys conducted by the Department of Interior. An interesting fact is that 52% of anglers fishing Minneapolis area lakes and 47% of anglers fishing Ramsey County Lakes are not required to purchase a fishing license because they are either under sixteen years of age or sixty-five and older.

Table 1. Number and Percent of Male and Female Anglers by Age Group for Minneapolis Lakes, (All lakes included) May 18 - October 31, 1974

Age Group	No. Male	% Male	No. Female	% Female	Total No.	% Total
0-12	660	26.85	62	2.52	722	29.37
13-15	299	12.17	19	.77	318	12.94
16-17	52	2.12	7	.28	59	2.40
18-24	130	5.29	23	.93	153	6.22
25-34	296	12.04	55	2.24	351	14.28
35-44	177	7.20	36	1.47	213	8.67
45-64	364	14.81	44	1.79	408	16.60
65+	210	8.54	24	.98	234	9.52
Total	2188	89.02	270	10.98	2458	100.00

Table 2. Number and Percent of Male and Female Anglers by Age Group for Ramsey County Lakes, (All lakes included) May 18 - October 31, 1974

Age Group	No. Male	% Male	No. Female	% Female	Total No.	% Total
0-12	322	27.59	22	1.89	344	29.48
13-15	133	11.40	5	.43	138	11.83
16-17	21	1.80	1	.09	22	1.89
18-24	89	7.62	12	1.03	101	8.65
25-34	166	14.22	16	1.37	182	15.59
35-44	146	12.51	19	1.63	165	14.14
45-64	131	11.23	13	1.11	144	12.34
65+	61	5.23	10	.85	71	6.08
Total	1069	91.60	98	8.40	1167	100.00

On both groups of lakes, over ninety-nine percent of the anglers traveled less than twenty-five miles to fish on any particular lake. The small percentage in the 20+ category were people from out of state visiting relatives or they were here for a convention of some type. The distances traveled are shown in Tables 3 and 4.

Table 3. Percentage of Anglers from 25 Mile Zones for Ramsey County Lakes,
May 18 - October 31, 1974

<u>Miles Traveled</u>	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>% Total</u>
0-25	100.00	99.41	100.00	100.00	99.29	100.00	99.69	99.56	99.52
26-50					.14		.31	.44	.18
51-75		.59							.06
76-100									---
101-150									---
151-200									---
201+					.57				.24
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 4. Percentage of Anglers from 25 Mile Zones for Minneapolis Lakes,
May 18 - October 31, 1974

<u>Miles Traveled</u>	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lake of the Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>% Total</u>
0-25	100.00	100.00	98.30	98.72	99.59	99.79	98.61	97.58	99.08
26-50				.64	.20		.46	.61	.23
51-75								.61	.06
76-100				.32					.02
101-150			.57						.01
151-200			.38		.10				.09
201+			.75	.32	.10	.21	.93	1.21	.43
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 5. Average Length of Complete Fishing Trips for Ramsey County Lakes,
May 18 - October 31, 1974. Number of Trips in Parentheses.

<u>Lake</u>	<u>Boat</u>	<u>Bank</u>	<u>Pier</u>	<u>Total</u>
Island		.50 (1)		.50 (1)
Johanna	2.35 (8)			2.35 (8)
Josephine		2.50 (2)		2.50 (2)
Loeb		1.00 (1)		1.00 (1)
Long	4.18 (7)	1.89 (8)	.50 (1)	2.80 (16)
Owasso	2.33 (4)			2.33 (4)
Phalen		.70 (5)		.70 (5)
Snail	3.48 (14)	1.35 (2)		3.22 (16)
Total	3.21 (33)	1.46 (19)		2.53 (53)

Table 6. Average Length of Complete Fishing Trips in Hours for Minneapolis Lakes, May 18 - October 31, 1974. Number of Trips in Parentheses.

<u>Lake</u>	<u>Boat</u>	<u>Bank</u>	<u>Pier</u>	<u>Total</u>
Wirth	2.00 (1)	1.00 (1)		1.50 (2)
Brownie		2.33 (2)		2.38 (2)
Cedar	1.30 (1)	2.65 (15)	1.40 (3)	2.46 (19)
Lake of the Isles		2.63 (4)		2.63 (4)
Calhoun		1.00 (1)	1.72 (5)	1.60 (6)
Harriet	.50 (1)	.50 (3)	1.65 (4)	1.40 (8)
Nokomis		.90 (5)	1.03 (3)	.95 (8)
Hiawatha		1.00 (1)	1.08 (3)	1.06 (4)
Total	1.27 (3)	2.00 (32)	1.51 (18)	1.83 (53)

Trip Data:

Whether or not a trip was completed was determined during the interview, and only completed trips were used to obtain the average length of boat, bank and pier trips. The results are shown in Tables 5 and 6. The average length of pier and boat trips are not really comparable between the two groups of lakes. Outboard motors are allowed on Minneapolis lakes by permit only, while there were no outboard motor restrictions on most Ramsey County Lakes (except Lake Phalen and Loeb Lake). There are seven fishing piers provided on the Minneapolis Lakes, while only two fishing piers are provided on the Ramsey County Lakes.

Fishing Pressure and Non-Fishing Recreational Pressure:

Fishing Pressure:-

In terms of total acreage, the two groups of lakes are nearly identical, yet there were twice as many man-hours spent fishing on Minneapolis Lakes as on the Ramsey County Lakes (Table 7). The estimated man-hours per acre, estimated man-trips, and the estimated man-trips per acre are all approximately twice that found on the Ramsey County Lakes.

Table 7. Summary of the Fishing Pressure on Minneapolis Lakes and on the Ramsey County Lakes, May 18 - October 31, 1974

	<u>Total Acres</u>	<u>Total Estimated Man-hours</u>	<u>Est. Man-Hrs. Per Acre</u>	<u>Estimated Man-trips</u>	<u>Est. Man-trips Per Acre</u>
Minneapolis Lakes	1,384.3	90,314.85	65.71	49,352.4	35.91
Ramsey County Lakes	1,292.2	44,987.86	35.80	17,781.8	14.15

Tables 1a and 2a, in the appendix, provide a lake-by-lake breakdown of fishing pressure on Minneapolis Lakes and Ramsey County Lakes, respectively. Of the Minneapolis Lakes, Lake Calhoun experienced the highest number of man-hours for the period (20,426.69), while Brownie Lake had the least number of man-hours for the period (4,688.24). However, Brownie Lake had the highest estimated man-hours per acre

(459.63), while Lake Harriet claimed the lowest number of estimated man-hours per acre with 35.19. Considering the Ramsey County Lakes, Long Lake had the greatest number of estimated man-hours for the period (12,536.08), while Island Lake claimed the fewest with an estimated 678.01 man-hours. In terms of man-hours per acre, Loeb Lake had the most, 95.16, while Island Lake experienced the least, 12.04. Twin Lake and Powderhorn Lake are not included in any tables or figures presented in this paper. There were no anglers, sailboats or runabouts, and only two canoes, observed on Twin Lake. The only fishing observed on Powderhorn Lake was during June when an estimated 13.81 man-hours per acre occurred. No canoes, sailboats or ranabouts were observed.

Non-Fishing Recreational Pressure:-

Although not included in this study, it was obvious to census clerks that shore-line activity, including swimming, wading, sunbathing and picnicing was extremely popular in early summer. The combined hours spent in those activities from mid-June to mid-July would exceed the censused recreation during that period particularly on lakes with public shorelines.

The most popular censused non-fishing recreational activity on Minneapolis Lakes in terms of total hours is sailboating, followed by canoeing (Table 8). These lakes are probably more appealing to people interested in sailboating and canoeing, as water skiing and speed or pleasure boating are not allowed. Another reason why canoeing could be so popular is the fact that one can put a canoe in at Lake Calhoun and then canoe to Lake of the Isles, Cedar Lake and Brownie Lake. This is approximately a 3½ mile trip one way. By far, the most popular non-fishing recreational activity on the Ramsey County Lakes was speed or pleasure boating, followed by water skiing (Table 8).

Table 8. Summary of the Non-Fishing Recreational Pressure Expressed in Sailboat, Canoe and Runabout Hours. Water Skiing is Expressed in Man-Hours

	<u>Sailboats</u>	<u>Canoes</u>	<u>Runabouts</u>	<u>Water Skiing</u>
Minneapolis Lakes	24,311.97	14,292.11	50.47	---
Ramsey County Lakes	3,912.22	4,855.0	14,882.29	6,563.13

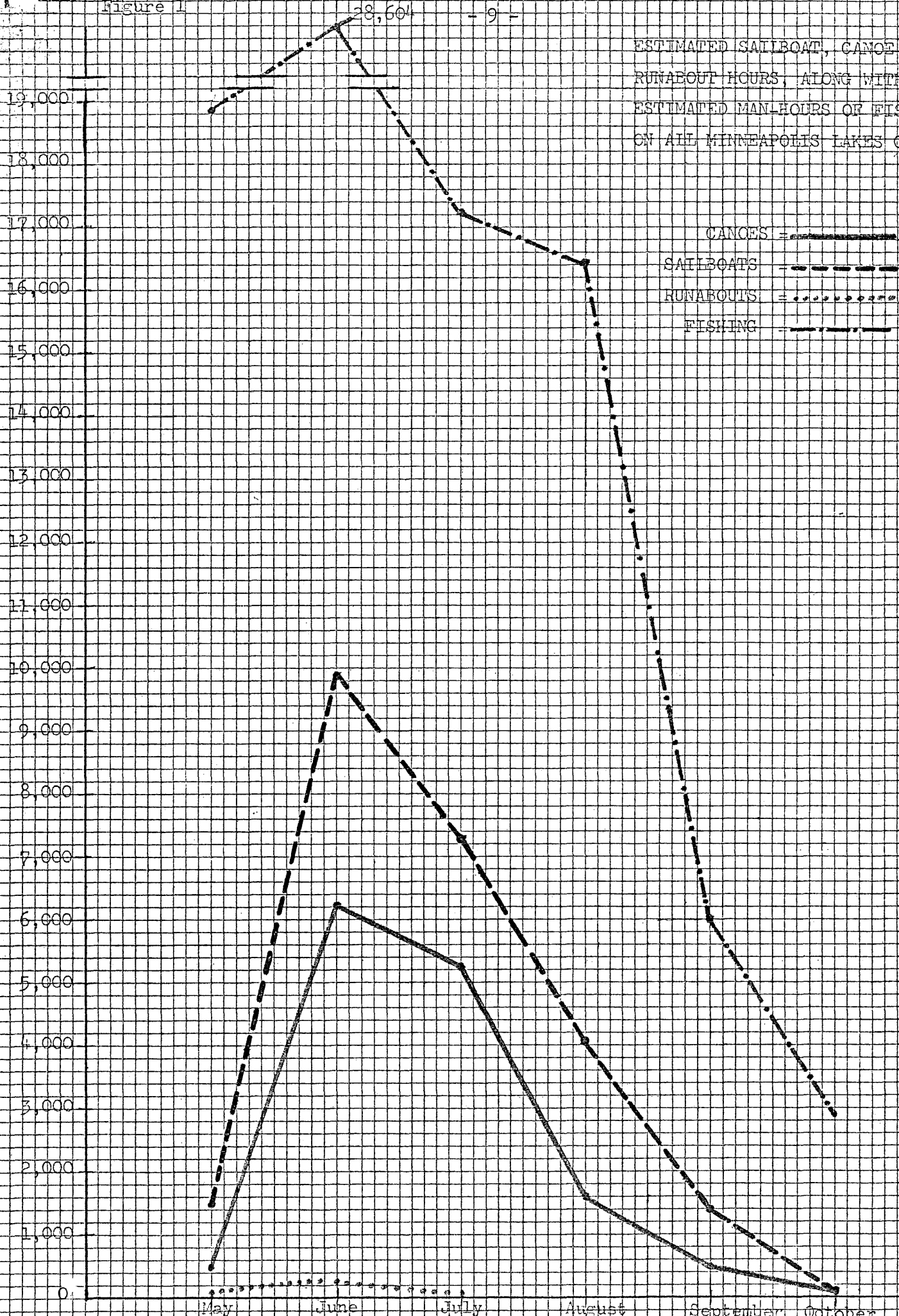
Tables 3a and 4a show a lake-by-lake breakdown of the non-fishing recreational pressure. The greatest sailboat pressure among the Minneapolis Lakes occurred on Lake Harriet with 38.21 sailboat hours per acre; while canoe pressure was greatest on Lake of the Isles, which had 52.01 canoe hours per acre. There was no water skiing pressure on the Minneapolis Lakes, and only 50.47 runabout hours on all lakes for the entire census period. The runabout and water skiing pressure among the Ramsey County Lakes was greatest on Island Lake, which had 28.28 runabout hours per acre, and 13.19 man-hours per acre for water skiing. Sailboat and canoe pressure was greatest on Lake Phalen, where sailboat hours per acre were 5.52, and canoe hours per acre were 9.82. Speed boating and water skiing are not allowed on Lake Phalen.

Figures 1 and 2 show how the total fishing and non-fishing recreational pressure was distributed, month by month, for the Minneapolis Lakes and the Ramsey County Lakes, respectively. Fishing pressure was at a maximum for both groups of



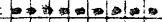
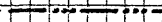

Figure 1

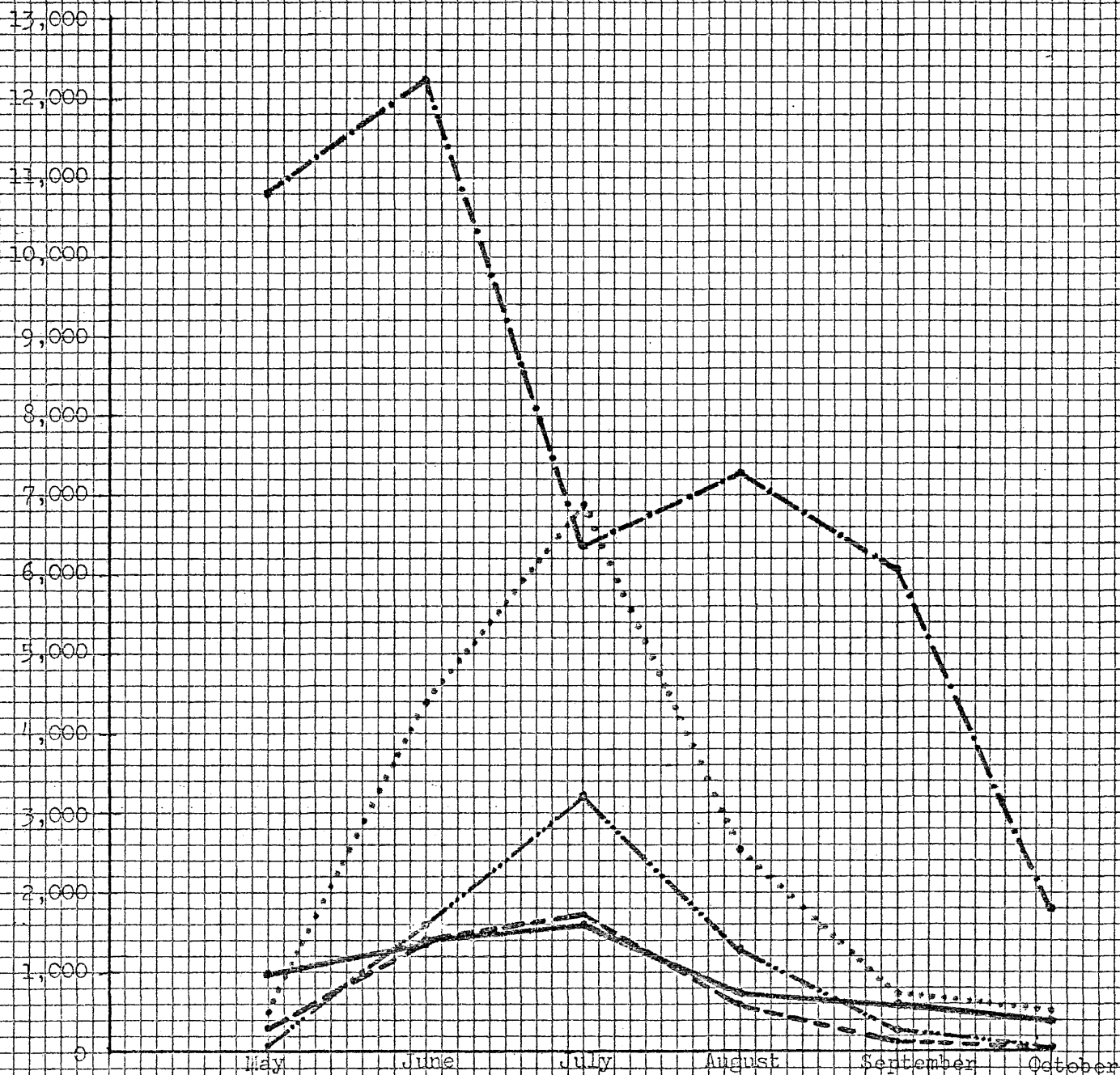
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ESTIMATED SAILBOAT, CANOE AND
RUNABOUT HOURS, ALONG WITH THE
ESTIMATED MAN-HOURS OF FISHING
ON ALL MINNEAPOLIS LAKES COMBINED



ESTIMATED SAILBOAT, CANOE AND
RUNABOUT HOURS, ALONG WITH THE
ESTIMATED MAN-HOURS FOR FISHING
AND WATER SKIING FOR SELECTED
RAMSEY COUNTY LAKES COMBINED.

CANOES = 
SAILBOATS = 
RUNABOUTS = 
WATER SKIING = 
FISHING = 



lakes during June, with the month of May being second. June was also the month for the most canoe and sailboat pressure on Minneapolis Lakes, while July was the month with maximum non-fishing recreational activities on Ramsey County Lakes.

Fishing Style:

Due to restrictions placed on outboards, over ninety-eight percent of the fishing on Minneapolis Lakes is done from shore and piers (Table 9). Anglers on Ramsey County Lakes carry out about forty percent of their fishing from boats. There is less fishing from piers on Ramsey County Lakes because there are only two fishing piers provided; one on Long Lake and one on Island Lake. Neither pier is as well suited for fishing as the seven fishing piers constructed and installed by the Minneapolis Park Board on Minneapolis Lakes. In addition, there is no suitable parking space by the fishing pier on Long Lake. In spite of this, over 2,200 man-hours of fishing occurred on this pier. Fishing piers constructed and installed by the Minneapolis Park Board are very popular fishing spots. One pier on Lake Nokomis provided over 6,000 hours of fishing. In addition to solid construction, successful fishing piers are located near a parking area, installed where water drops off to at least 6 - 8 foot depth, and located away from other high density shore recreation areas, such as picnic or swimming areas.

The most popular method of fishing on both groups of lakes was still fishing, and natural bait was the most frequently used bait or lure.

Table 9. Percent of Fishing Pressure for Different Types of Fishing.
Estimated Man-hours Appear in Parentheses

	<u>Boat</u>	<u>Bank</u>	<u>Pier</u>
Minneapolis Lakes	1.54 (1,389.54)	57.92 (52,308.22)	40.54 (36,615.21)
Ramsey County Lakes	39.97 (17,971.04)	54.32 (24,423.59)	5.71 (2,568.23)

Tables 5a and 6a show a lake-by-lake breakdown of the fishing style.

Principal Species Sought:

On Minneapolis Lakes, 45.81 percent of the total anglers interviewed indicated they were fishing for more than one species, or any species that would bite, while 18.96 percent indicated they were fishing for sunfish, and 10.73 percent indicated they were fishing for panfish. The sunfish group includes bluegills, pumpkinseeds, green sunfish and hybrid sunfish. The panfish group includes the above species plus black and white crappies and three species of bullheads. People who indicated they were fishing for panfish were usually seeking sunfish species and/or crappies, rather than bullheads or perch. On Ramsey County Lakes, 46.79 percent of the total anglers interviewed indicated they were fishing for more than one species, or any species that would bite; 27.59 percent indicated they were fishing for northerns, and 9.94 percent indicated they were fishing for sunfish. Tables 7a and 8a give the lake-by-lake breakdown of the species sought.

Tables 9a and 10a show the species composition of the catch. On Minneapolis Lakes, bluegills, crappies, and pumpkinseeds made up 91.20 percent of the total catch, while the same species comprised 72.32 percent of the catch on Ramsey County Lakes.

FISHING SUCCESS

Catch per Unit of Effort:-

This parameter is expressed in numbers of fish per man-hour for each species on each lake and for the combined number of species caught on each lake. The combined catch rate on Ramsey County Lakes varied from 0.159 fish per man-hour on Long Lake to 1.045 fish per man-hour on Snail Lake (Table 11a). The species which had the highest individual catch rate was the bluegill on Lake Owasso with 0.638 per man-hour. The combined catch rate on Minneapolis Lakes ranged from 0.170 fish per man-hour on Lake Hiawatha to 2.250 fish per man-hour on Lake of the Isles (Table 12a). The highest individual catch rate for an individual species was on Lake of the Isles where 1.851 bluegills per man-hour were caught.

Catch per Man-Hour by Fishing Method and Lure:-

Still fishing was by far the most popular fishing method on both groups of lakes. Fish were caught at the rate of 1.229 per man-hour on Minneapolis Lakes (Table 13a), while anglers on the Ramsey County Lakes who were still fishing caught fish at the rate of 0.614 per man hour (Table 14a). The catch by still fishing consisted mainly of bluegills and black crappies on Minneapolis Lakes, while bluegills and pumpkin-seeds dominated the catch on Ramsey County Lakes. Anglers who jigged had better luck catching black crappies on Minneapolis Lakes than the anglers using other methods. Jigging was not a popular method on Ramsey County Lakes.

Tables 15a - 20a show the actual number of each species for the different types of fishing per lake and the catch rate. On Ramsey County Lakes, boat fishing had the highest total catch rate, while bank fishing had the highest total catch rate on Minneapolis Lakes. Considering the lakes individually, the above relationship did not always hold true.

Natural bait was the most popular bait or lure used on both groups of lakes, with the anglers on Minneapolis Lakes having a catch rate of 1.246 fish per man-hour compared to 0.591 fish per man-hour on Ramsey County Lakes (Tables 13a and 14a).

Catch Rate for Selected Species:-

During each interview, the angler was asked what particular species he or she was fishing for. Tables 10 and 11 provide the catch per man-hour for more important species or classes of fish by different types of fishing. The catch rates given were calculated by dividing the number of a particular specie or class of fish by the number of hours spent fishing for that specie or class of fish. The catch rate for most species was generally better on Minneapolis Lakes.

Table 10. The Catch Rate of Anglers Fishing for a Specific Species on Minneapolis Lakes (All Lakes Grouped Together). Results are in Fish per Man-Hour.

	<u>Northern</u>	<u>Crappies</u>	<u>Sunfish</u>	<u>L.M. Bass</u>	<u>Mixed</u>	<u>Panfish</u>	<u>Perch</u>	<u>Rough Fish</u>
Boat	.176		.914	.274	.625	5.00		
Bank	.071	1.945	2.867	.101	.739	1.357		.051
Pier	.051	.861	2.097	.636	.588	1.955	1.463	.061
Total	.061	1.307	2.542	.203	.679	1.560	1.463	.051

Table 11. The Catch Rate of Anglers Fishing for a Specific Species on Ramsey County Lakes (All Lakes Grouped Together). Results are in Fish per Man-Hour

	<u>Northern</u>	<u>Crappies</u>	<u>Sunfish</u>	<u>L.M. Bass</u>	<u>Bullheads</u>	<u>Mixed</u>	<u>Panfish</u>	<u>Rough Fish</u>
Boat	.050	.337	2.738	.189		.577	1.125	
Bank	.040		1.124	.160	.100	.199	.697	.500
Pier	.070				.170	.090		4.110
Total	.040	.285	1.900	.169	.110	.348	.916	3.450

Number and Percent Successful Anglers:-

Tables 12 and 13 show the number of anglers interviewed, and the number that were successful for each lake. A successful angler is anyone who caught at least one fish.

Table 12. The Number and Percentage of Successful Fishermen on Minneapolis Lakes During May 18 - October 31, 1974

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. of Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Total Fishermen	146	164	390	281	600	306	341	230	2,458
Successful	36	70	165	172	289	61	126	39	958
Percent Successful	24.70	42.70	42.30	61.20	48.20	19.90	37.00	17.00	39.00

Table 13. The Number and Percentage of Successful Fishermen on Ramsey County Lakes During May 18 - October 31, 1974

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Total Fishermen	29	138	28	30	407	125	226	184	1,167
Successful	6	27	8	5	46	54	36	74	256
Percent Successful	20.70	19.60	28.60	16.67	11.30	43.20	15.90	40.20	21.94

By comparing the various tables under fishing success, one can conclude that fishing is generally better on Minneapolis Lakes than on the Ramsey County Lakes.

HARVEST

This parameter is expressed in estimated numbers of each species caught, estimated pounds of each species caught and estimated pounds per acre for each lake. Lake Calhoun had the highest estimated total number and pounds of fish removed of all lakes censused, followed closely by Lake of the Isles (Tables 21a and 22a). Snail Lake had the highest estimated total number and pounds removed for Ramsey County Lakes, with Lake Owasso second. Anglers on Minneapolis Lakes caught over five times as many fish as the anglers on Ramsey County Lakes (Table 14). The overall average weight of all fish combined was 0.284 pounds on Minneapolis Lakes and 0.402 pounds on Ramsey County Lakes. Tables 23a and 24a show the harvest for each specie for each lake and gives the total harvest for each lake.

Table 14. Estimated Catch of all Species in Numbers and Pounds for Minneapolis Lakes and Ramsey County Lakes. May 18 - October 31, 1974

	<u>Total Acres</u>	<u>Est. Numbers</u>	<u>Est. Pounds</u>	<u>Overall Av. Wt.</u>	<u>Est. Lbs. Per Acre</u>
Minneapolis Lakes	1,384.3	105,386.0	29,938	.284	21.79
Ramsey County Lakes	1,292.2	20,699.0	8,313.4	.402	6.62

DISCUSSION

There is data available on harvest and pressure from various lakes located around the state. Moyle and Franklin (1955) presented data from twelve lakes. The data given is for summer angling only which covered the period from May 15, 1954, through October 15, 1954 (Table 15).

Table 15. The Harvest and Pressure for Summer Angling on Some Minnesota Lakes

<u>Lake</u>	<u>County</u>	<u>Acres</u>	<u>Year Censused</u>	<u>Harvest in Lbs./Acre</u>	<u>Pressure in Man-Hrs./Acre</u>
Bald Eagle	Ramsey	1,012	1954	26.7	81.8
Linwood	Anoka	599	"	18.5	70.8
Francis	LeSueur	898	"	37.1	45.9
Clear	LeSueur	312	"	56.1	50.8
Maple	Douglas	825	"	22.9	29.6
Grove	Pope	461	"	11.5	26.7
Little Pine	Ottertail	2,113	"	6.6	19.0
Sally	Becker	1,262	"	20.0	32.5
Ball Club	Itasca	5,111	"	2.7	3.6
Moose	Itasca	1,199	"	5.2	16.7
Gladstone	Crow Wing	481	"	30.0	47.3
Nokay	Crow Wing	653	"	22.5	10.3

Table 16 shows the data compiled by Johnson (1957). Once again the data given is for summer angling only. Summer angling here was considered to extend from April 20, 1956, through October 28, 1956.

Table 16. The Harvest and Pressure for Summer Angling for Some Minnesota Lakes

<u>Lake</u>	<u>County</u>	<u>Acres</u>	<u>Year Censused</u>	<u>Harvest in Lbs./Acre</u>	<u>Pressure in Man-Hrs./Acre</u>
Linwood	Anoka	599	1957	16.1	64.8
Long	Ramsey	177	"	1.9	10.8
Francis	LeSueur	898	"	40.8	103.7
Maple	Douglas	825	"	11.6	23.4
Grove	Pope	461	"	12.8	28.8
Gladstone	Crow Wing	481	"	5.1	15.8
Nokay	Crow Wing	653	"	15.8	31.5

Scidmore (1961) compiled data on fourteen bass-panfish lakes. Each lake was censused for one or more years, and the results that are given are averages for a year (Table 17).

Table 17. The Average Annual Pressure and Harvest on Some Minnesota Lakes

<u>Lake</u>	<u>County</u>	<u>Acres</u>	<u>Number of Yrs. Censused</u>	<u>Average Annual Harvest in Lbs./Acre</u>	<u>Average Amount Pressure M-H/Acre</u>
St. Olaf	Waseca	102	3	31	160
Frances	LeSueur	898	5	45	132
Beaver	Steele	108	3	28	131
Eagle	Hennepin	291	1	40	121
Bald Eagle	Ramsey	1,012	3	38	112
Cowdry	Douglas	197	1	43	101
Shady Oak	Hennepin	85	2	22	96
Reeds	Waseca		2	18	75
Linwood	Anoka	599	5	23	70
Grove	Pope	461	8	30	50
George	Anoka		3	14	46
Maple	Douglas	825	6	23	32
Mina	Douglas	325	1	17	32
Waconia	Carver	3,102	1	17	24

Table 18 gives data on thirteen largemouth bass and panfish lakes for the month of June only.

Table 18. The Estimated Pressure and Harvest for June, 1971, on Some Minnesota Lakes

<u>Lake</u>	<u>County</u>	<u>Acres</u>	<u>Year Censused</u>	<u>Harvest in Lbs./Acre</u>	<u>Pressure in Man-Hrs./Acre</u>
Maple	Douglas	825	1971	8.61	12.76
Cowdry	Douglas	197	"	13.09	27.13
Latoka	Douglas	776	"	5.83	7.46
Brophy	Douglas	289	"	6.78	18.44
Geneva	Douglas	691	"	5.76	12.38
Bay	Crow Wing	2,392	"	3.56	5.67
Nokay	Crow Wing	653	"	4.73	9.24
Hubert	Crow Wing	1,294	"	3.94	7.08
Gladstone	Crow Wing	481	"	5.61	8.56
Minnetonka	Hennepin				
Crystal Bay	"	827	"	9.40	15.69
North Arm	"	335	"	24.37	43.75
Maxwell Bay	"	311	"	27.12	43.50
Stubbs Bay	"	294	"	12.00	25.45
East Sylvia	Wright	657	"	7.55	9.44
Maple	Wright	777	"	4.51	11.74
Charlotte	Wright	235	"	14.75	15.05

(From Hawkinson & Krosch, 1971)

By comparing the preceeding tables with Tables 7, 1a and 2a, it is obvious that the Minneapolis and Ramsey County Lakes are not subjected to excessive fishing pressure (man-hours per acre). The exceptions would be the smaller Minneapolis Lakes, namely Brownie Lake, Wirth Lake and Lake Hiawatha. The remaining lakes experienced fishing pressure within the range found in the above creel censuses. The harvest can be compared by referring to Tables 14, 23a, 24a and Tables 15-18. The majority of the lakes in this creel census fell within the range reported in Tables 15-18. The exceptions are: Brownie Lake and Lake of the Isles where the harvest was greater than any of the other lakes, while the harvest on Island Lake was lower than the other lakes. The only direct comparisons that can be made are on Long Lake in Ramsey County. By comparing Table 16 with Tables 2a and 23a, one can see that the fishing pressure has increased over six times, while the harvest has increased over nine times since 1956.

Fishing may be the most popular recreational activity censused on all lakes during the survey period. This will not be the case on certain lakes during certain months. Beach activities, including swimming, sunbathing, wading, and picnicking, were not censused but were obviously the most popular form of recreation from mid-June to mid-July.

Once again it should be pointed out that sailboat, canoe and runabout pressure was not expressed in man-hours as an average number of people per craft was not obtained. Therefore, a direct comparison between the data in Tables 1a, 2a and 3a, 4a is not possible. At any rate, fishing was one of the most popular recreational activities, if not the most popular censused activity, on the city lakes surveyed.

SUMMARY

- 1/ An extensive creel census was conducted in 1974 on nine Minneapolis Lakes (1,384 acres) and nine Ramsey County Lakes (1,292 acres). During the period from mid-May through October, the time spent fishing on Ramsey County Lakes was estimated at 45,000 man-hours compared to 90,300 man-hours on Minneapolis Lakes.
- 2/ Of all lakes censused, Brownie Lake supported the most intense fishing pressure with 459.63 man-hours per acre. The greatest amount of fishing, 20,400 man-hours, occurred on Lake Calhoun. Lake-of-the-Isles produced the best fishing success with a catch rate of 2.25 fish per man-hour.
- 3/ Brownie Lake had the highest harvest of any lake censused with 120.27 lbs. per acre of fish removed. Lake Calhoun had the highest estimated total pounds of fish removed among all the lakes with 8,250 pounds.
- 4/ On the Minneapolis Lakes, 89.02 percent of the anglers interviewed were male and 10.98 percent were female. Of the people interviewed on Ramsey County Lakes, 91.60 percent were male and 8.40 percent were female.
- 5/ On both groups of lakes, over ninety-nine percent of the people traveled less than twenty-five miles to fish on any particular lake.
- 6/ Bank fishing, as opposed to fishing from pier or boat, was the most popular style of fishing...accounting for over 50% of the total fishing pressure on Minneapolis and Ramsey County Lakes.
- 7/ The Minneapolis Park Board has constructed and installed some very good fishing piers. The Lake Nokomis pier provided over 6,000 hours of fishing during the census.
- 8/ Still fishing was the most popular method of fishing on both groups of lakes, and natural bait was the most popular bait or lure used on both lake groups.
- 9/ Bluegills, crappies and pumpkinseeds made up 91.20 percent of the total number of fish caught on Minneapolis Lakes, while the same species comprised 72.32 percent of the fish caught on the Ramsey County Lakes.

10/ Of the anglers interviewed on Minneapolis Lakes, 45.81 percent interviewed indicated they were fishing for more than one species; 18.96 percent indicated they were fishing for sunfish; and 10.73 percent indicated they were fishing for panfish. 46.79 percent of the anglers on the Ramsey County Lakes were fishing for more than one species; 27.59 percent were fishing for northerns; and 9.99 percent indicated they were fishing for sunfish.

11/ Sailboating was the most popular non-fishing recreational activity censused on Minneapolis Lakes, while speed boating was the most popular non-fishing activity censused on Ramsey County Lakes.

12/ Recreational use peaked during June and July and fell off sharply by September and October.

RECOMMENDATIONS

Water is the outstanding natural resource of the Twin City Metropolitan area. Lakes and rivers are the unique features which set this metro area apart from all others in the United States. The potential to develop water based recreation for citizens of this area can't be matched anywhere.

Fishing is one of the most popular forms of summer recreation found on Minneapolis and Ramsey County Lakes censused. Fishing can be increased on the censused lakes if city and county parks implement some of the following:

First, a fishing pier, as constructed and installed by the Minneapolis Park Board, is capable of providing over 5,000 hours of fishing per year. Several lakes in Ramsey County could provide more fishing recreation with suitable piers. Lake Phalen, for example, would be expected to provide about 10,000 additional fishing hours per year with two properly located and developed piers. Fishermen preferred to fish lakes with more than one pier because they could choose an out of the wind location to fish. Since the lakes are not being overfished now, additional piers on all lakes will provide more fishing recreation. A few piers should be built or modified to accommodate wheel chairs.

Second, electric motors should be allowed on all lakes by removing all permit charges and/or regulations against their use. Electrics are slow, quiet, and should not conflict with other uses. Boat fishing should improve since there is practically none on lakes where motors (including electrics) are now discouraged by regulation or permit requirements.

The Department of Natural Resources will attempt to maintain or produce desirable fish populations. Natural northern pike spawning marshes have been destroyed through past development on most censused lakes, so this species depends on a regular stocking program. Loeb Lake will not carry fish through the winter, and thus fishing produced depends on an annual stocking of catchable size panfish. Intensive fish management will be tried on Island Lake in Shoreview and Powderhorn Lake in Minneapolis. It is expected that above average fishing pressure will result on these two lakes.

Lake Harriet in Minneapolis will be stocked with musky and walleye, instead of northern pike, in an attempt to provide a different predator complex.

A couple of general observations may be helpful in planning outdoor recreational programs in the Metro Region. One:-there is a need for bringing more shoreline into public ownership since that is where over half of the total fishing recreation occurs. Two:-there is a definite need for surface water use zoning since most attempts to control or restrict outboard motors use is accomplished by restricting or prohibiting boat launching. This not only reduces power boats but seems to be limiting other watercraft as well. The surface uses should be zoned, and then ample parking and launching facilities should be provided.

Compatible surface use activities should be encouraged in an attempt to realize the unique recreational opportunity this metropolitan area holds over all others in the nation.

ADDENDUM

The following figures can be used to convert watercraft hours to man-hours. These figures were obtained from creel censuses conducted on Lake Minnetonka in 1975, a twenty-six mile portion of the Mississippi River in 1976, and five metro area lakes in 1977:

<u>Type of Craft</u>	<u>Average People per Craft</u>
Speedboat or Runabout	2.98
Sailboat	2.42
Canoe	2.28
Pontoon or Houseboat	5.01
Fishing Boats	2.24

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Table 1a. Fishing Pressure on Minneapolis Lakes During May 18 - October 31, 1974.
Lake Acreages Appear In Parenthesis Below Each Lake (*October not Included)

<u>Lake (Acreage)</u>	<u>Days in Period</u>	<u>Average No. Anglers Per Hr.</u>	<u>Est. Man-Hour Period</u>	<u>Est. Man-Hour Day</u>	<u>Est. Man-Hour/Acre Day</u>	<u>Est. Man-Hour Acre</u>
Wirth* (38.1)	136	2.97	6,488.28	47.71	1.25	170.30
Brownie* (10.2)	136	2.74	4,688.24	34.47	3.38	459.63
Cedar (167.8)	167	6.16	13,063.15	78.22	.46	77.43
Lake of the Isles* (109.0)	136	5.64	12,094.11	88.93	.82	110.96
Calhoun (447.01)	167	8.99	20,426.69	122.32	.27	45.69
Harriet (344.8)	167	4.68	12,135.79	72.67	.21	35.19
Nokomis* (203.6)	136	6.75	13,231.59	97.29	.48	64.99
Hiawatha (53.5)	167	3.87	8,187.00	49.02	.92	153.03

Table 2a. Fishing Pressure on Selected Ramsey County Lakes During May 8 - October 31, 1974.
Lake Acreages Appear in Parenthesis Below Each Lake (*October not Included)

<u>Lake (Acreage)</u>	<u>Days in Period</u>	<u>Average No. Anglers Per Hr.</u>	<u>Est. Man-Hour Period</u>	<u>Est. Man-Hour Day</u>	<u>Est. Man-Hour/Acre Day</u>	<u>Est. Man-Hour Acre</u>
Island* (56.3)	136	.46	678.01	4.985	.089	12.041
Johanna (200.46)	167	2.32	6,788.12	40.65	.202	33.861
Josephine* (118.0)	136	.57	1,489.98	10.59	.090	12.201
Loeb* (9.4)	136	.46	894.47	6.58	.700	95.16
Long (176.8)	167	5.48	12,536.08	75.07	.425	70.91
Owasso (349.0)	167	2.13	5,984.69	35.84	.102	17.15
Phalen (188.5)	167	3.41	9,151.12	54.80	.291	48.55
Snail (158.2)	167	2.81	7,447.07	44.593	.282	47.07

Table 3a. Non-Fishing Recreational Pressure on Minneapolis Lakes during May 18 - October 31, 1974. Results are Expressed In Sailboat and Canoe Hours. Acreages are in Parenthesis Below Each Lake. (*October not Included)

Lake	<u>SAILBOATS</u>						<u>CANOES</u>				
	Days in Period	Number Counted	Est. Hrs. per Period	Est. Hrs. per Day	Est. Hrs. Per Acre Per Day	Est. Hrs. per Acre	Number Counted	Est. Hrs. per Period	Est. Hrs. per Day	Est. Hrs. per Acre per Day	Est. Hrs. per Acre
Wirth* (38.1)	136	0	--	--	--	--	3	67.74	.498	.013	1.79
Brownie* (10.2)	136	0	--	--	--	--	27	463.82	3.41	.334	45.47
Cedar (168.7)	167	13	293.18	1.76	.01	1.74	168	3,591.28	21.50	.127	21.29
Lk. Isles* (109)	136	12	212.85	1.57	.014	1.95	249	5,668.57	41.68	.382	52.01
Calhoun (447.01)	167	333	6,867.43	41.12	.091	15.34	59	1,216.70	7.29	.016	2.72
Harriet (344.8)	167	640	13,175.32	78.89	.229	38.21	93	2,256.56	13.51	.039	6.54
Nokomis* (203.6)	136	198	3,763.19	27.67	.136	18.48	35	768.0	5.65	.028	3.77
Hiawatha (53.5)	167	0	--	--	--	--	11	259.44	1.91	.036	4.85

Table 4a. Non-Fishing Recreational Pressure on Selected Ramsey County Lakes During May 18 - October 31, 1974. Results, Except for Water Skiing, are Expressed in Sailboat, Canoe, and Runabout Hours. Lake Acreages are in Parenthesis Below Each Lake (*October not Included)

Lake	<u>SAILBOATS</u>						<u>CANOES</u>				
	Days in Period	Number Counted	Est. Hrs. per Period	Est. Hrs. per Day	Est. Hrs. Per Acre Per Day	Est. Hrs. per Acre	Number Counted	Est. Hrs. per Period	Est. Hrs. per Day	Est. Hrs. per Acre per Day	Est. Hrs. per Acre
Island* (56.3)	136	5	148.27	1.09	.02	2.63	5	127.67	.94	.017	2.27
Johanna (200.46)	167	47	1,097.36	6.57	.033	5.47	29	576.54	3.45	.017	2.88
Josephine* (118.00)	136	8	302.45	2.22	.019	2.56	8	361.89	2.66	.023	3.07
Loeb* (9.4)	136	0	0	0	0	0	0	0	0	0	0
Long (176.8)	167	3	175.03	1.05	.006	.99	19	625.11	3.74	.021	3.54
Owasso (349.0)	167	29	721.83	4.32	.012	2.07	11	294.32	1.76	.005	.84
Phalen (188.5)	167	37	1,039.72	6.23	.033	5.52	63	1,850.54	11.08	.059	9.82
Snail (158.2)	167	19	427.54	2.56	.016	2.70	38	1,018.93	6.10	.039	6.44

Table 4a.

(Cont'd)

Non-Fishing Recreational Pressure on Selected Ramsey County Lakes During May 18 - October 31, 1974.

Results, Except for Water Skiing, are Expressed in Sailboat, Canoe, and Runabout Hours. Lake Acreages are in Parenthesis Below Each Lake (*October not Included)

Lake	RUNABOUTS						WATER SKIING				
	Days in Period	Number Counted	Est. Hrs. Per Period	Est. Hrs. per Day	Est. Hrs. Per Acre Per Day	Est. Hrs. per Acre	Number Counted	Est. M-H per Period	Est. M-H per Day	Est. M-H per Acre per Day	Est. M-H per Acre
Island* (56.3)	136	71	1,592.35	11.71	.208	28.28	27	742.53	5.46	.097	13.19
Johanna (200.46)	167	192	5,090.97	30.49	.152	25.40	73	1,979.05	11.85	.059	9.87
Josephine* (118.00)	136	22	634.56	4.67	.040	5.38	11	285.61	2.10	.018	2.42
Loeb* (9.4)	136	0	0	0	0	0	0	0	0	0	0
Long (176.8)	167	38	1,010.74	6.05	.034	5.72	14	426.27	2.55	.014	2.41
Owasso (349.0)	167	194	4,882.79	29.24	.084	13.99	79	2,075.56	12.43	.036	5.95
Phalen (188.5)	167	0	0	0	0	0	0	0	0	0	0
Snail (158.2)	167	76	1,670.88	10.01	.063	10.56	31	1,054.13	6.31	.040	6.66

Table 5a. Fishing Style on Minneapolis Lakes Censused During May 18 - October 31, 1974, in Percent.
Estimated Man-Hours Appear in Parenthesis

FISHING STYLE												
<u>Lake</u>	<u>Fishing Type</u>			<u>Fishing Method</u>					<u>Fishing Bait or Lure</u>			
	<u>Boat</u>	<u>Bank</u>	<u>Pier</u>	<u>Still</u>	<u>Troll</u>	<u>Cast</u>	<u>Jig</u>	<u>Mixed</u>	<u>Natural</u>	<u>Artificial</u>	<u>Mixed</u>	<u>Prepared</u>
Wirth	(211.52) 3.26	(1489.06) 22.95	(4787.05) 73.78	89.66	--	5.52	.69	4.14	88.97	7.59	3.45	--
Brownie	(107.83) 2.30	(4580.41) 97.70	--	95.73	--	3.66	--	.61	94.51	3.66	1.83	--
Cedar	(232.52) 1.78	(10,690.88) 31.84	(2139.74) 16.38	83.80	.77	10.80	--	4.63	82.01	8.23	9.77	--
Lk. Isles	(62.89) .52	(12,031.22) 99.48	--	89.26	--	7.04	.74	2.96	82.22	10.00	7.78	--
Calhoun	(93.96) .46	(5413.07) 26.50	(14,919.65) 73.04	81.42	--	12.67	3.04	2.87	70.61	20.44	8.61	.34
Harriet	(680.82) 5.61	(6487.79) 53.46	(4965.97) 40.92	71.57	1.96	19.61	--	6.86	70.26	23.53	6.21	--
Nokomis	--	(7011.42) 52.99	(6220.17) 47.01	87.98	--	8.21	1.47	2.35	75.66	17.01	7.33	--
Hiawatha	--	(4604.37) 56.24	(3582.63) 43.76	87.77	--	10.04	--	2.18	81.66	12.23	6.11	--
Total	(1389.54) 1.54	(52,308.22) 57.92	(36,615.21) 40.54	84.40	.37	10.71	1.07	3.45	78.12	14.57	7.22	.08

Table 6a. Fishing Style on Selected Ramsey County Lakes Censused During May 18 - October 31, 1974, in Percent.
Estimated Number of Man Hours Appears in Parenthesis

<u>FISHING STYLE</u>												
<u>Lake</u>	<u>Fishing Type</u>			<u>Fishing Method</u>					<u>Fishing Bait or Lure</u>			
	<u>Boat</u>	<u>Bank</u>	<u>Pier</u>	<u>Still</u>	<u>Troll</u>	<u>Cast</u>	<u>Jig</u>	<u>Mixed</u>	<u>Natural</u>	<u>Artificial</u>	<u>Mixed</u>	<u>Prepared</u>
Island	(43.32) 6.39	(634.69) 93.61	(43.32) 6.39	96.55	--	3.45	--	--	89.66	10.34	--	--
Johanna	(4145.50) 61.07	(2642.62) 38.93	--	63.85	.77	16.15	--	19.23	60.00	18.46	21.54	--
Josephine	--	(1439.98) 100.00	--	96.43	--	3.57	--	--	89.29	10.71	--	--
Loeb	--	(894.47) 100.00	--	100.00	--	--	--	--	100.00	--	--	--
Long	(2203.84) 17.58	(8122.13) 64.79	(2210.11) 17.63	69.04	.98	18.43	--	11.55	72.24	17.20	10.57	--
Owasso	(4425.68) 73.95	(1559.01) 26.05	--	50.40	14.40	18.40	--	16.80	56.80	25.60	17.60	--
Phalen	(638.75) 6.98	(8197.57) 89.58	(314.80) 3.44	62.83	--	29.65	.88	6.64	63.72	27.88	8.41	--
Snail	(6513.95) 87.47	(933.12) 12.53	--	65.76	1.09	19.02	--	14.13	61.41	21.20	17.39	--
Total	(17,971.04) 39.97	(24,423.59) 54.32	(2568.23) 5.71	66.87	2.16	19.24	.17	11.56	67.39	20.19	12.42	--

Table 7a. The Percentage of Fishermen Actually Seeking a Specific Species on Ramsey County Lakes during May 18 - October 31, 1974 (Number of Fishermen Seeking in Parenthesis)

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern		11.54	32.14	6.67	56.02	7.20	7.96	21.74	27.59 (322)
Walleye					.25		1.77		.43 (5)
Crappies				3.33		4.80	2.21		1.03 (12)
Sunfish		23.08		36.67	.49	15.20	10.62	15.22	9.94 (116)
L. M. Bass		14.62			.98	11.20	6.19	7.61	5.66 (66)
Bullheads	55.17			3.31	1.23		.88		2.06 (24)
Mixed	44.83	48.46	53.57	50.00	36.61	45.60	63.27	47.28	46.79 (546)
Panfish		1.54	7.14		1.47	14.40	6.64	8.15	5.06 (59)
Perch			7.14		2.95	1.60			.17 (2)
Rough Fish			7.14		2.95		.44		1.29 (15)
Total	100.00 (29)	100.00 (138)	100.00 (28)	100.00 (30)	100.00 (407)	100.00 (125)	100.00 (226)	100.00 (184)	100.00 (1167)

Table 8a. The Percentage of Fishermen Actually Seeking a Specific Species on Minneapolis Lakes during May 18 - October 31, 1974 (Number of Fishermen Seeking in Parenthesis)

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern	.69	1.22	5.13	.36	8.83	26.47	3.52	25.21	9.28 (228)
Walleye					.17				.04 (1)
Crappies	11.64	1.83	2.05	4.63	12.33	7.52	22.29	5.66	9.24 (227)
Sunfish	2.05	21.34	31.28	28.83	33.17	2.29	3.52	3.04	18.96 (466)
L.M. Bass	8.22	6.71	4.62	1.07	.83	4.90	1.47		2.81 (69)
Bullheads							.29	.87	.12 (3)
Mixed	71.23	54.88	39.49	43.06	29.50	51.96	58.36	53.04	45.81 (1126)
Panfish	4.11	7.93	16.15	21.00	14.34	3.27	7.33	1.31	10.73 (265)
Perch	.69	.61			.33	.65			.24 (6)
Rough Fish	1.37	5.49	1.28	1.07	.50	2.94	3.23	10.87	2.73 (67)
Total	100.00 (146)	100.00 (164)	100.00 (390)	100.00 (281)	100.00 (600)	100.00 (341)	100.00 (341)	100.00 (230)	100.00 (2458)

Table 9a. The Percent Species Composition of Catch for May 18 - October 31, 1974, with the Actual Numbers of Fish in Parenthesis. Ramsey County Lakes

<u>Species</u>	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern			62.50		14.16	1.02	5.78	2.84	4.13 (38)
Walleye					.88				.11 (1)
Black Crappie		5.51			3.54	6.12	13.04	8.79	7.17 (66)
White Crappie						.51			.11 (1)
Bluegill		84.25	12.50	46.67	3.54	79.08	68.12	34.63	49.40 (455)
Pumpkinseed		1.57			1.02			36.18	15.64 (144)
Green Sunfish								.52	.22 (2)
Hybrid Sunfish								1.55	.65 (6)
L.M. Bass		3.15			5.31	11.73	8.70	5.94	7.06 (65)
Perch			12.50		1.77	.51	1.45		.54 (5)
Bl. Bullhead	83.33	.79		53.33	57.52		2.90	4.13	10.53 (97)
Br. Bullhead	16.67	4.72			.88			5.43	3.15 (29)
Yel. Bullhead									
Carp			12.50		19.73				1.30 (12)
Suckers									
Total	100.00 (6)	100.00 (127)	100.00 (8)	100.00 (15)	100.00 (113)	100.00 (196)	100.00 (69)	100.00 (387)	100.00 (921)

Table 10a. The Percent Species Composition of Catch for May 18 - October 31, 1974, with Actual Numbers of Fish in Parenthesis. Minneapolis Lakes

<u>Species</u>	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern			.36		.37	6.67		16.42	.76 (31)
Bluegill	16.67	92.45	83.96	82.25	74.72	10.56	4.54	20.90	66.86 (2720)
Perch	25.93	.38	3.89	.24	1.34	8.89	11.96	10.45	3.79 (154)
Bl. Crappie	30.55	3.02	8.51	15.89	22.23	43.33	75.60	23.88	23.53 (957)
Carp	.93	1.13		.46			.96	4.48	.37 (15)
Br. Bullhead			.12		.07	5.00	.48	2.99	.30 (12)
S.M. Bass								1.49	.02 (1)
L.M. Bass	3.70	1.51	2.31	.81	1.04	21.11	.72		2.19 (89)
Gr. Sunfish	1.85	.38	.12				.24	1.49	.15 (6)
Bl. Bullhead	8.33					2.22	4.06	13.43	.96 (39)
Yel. Bullhead						2.22		1.49	.12 (5)
White Crappie	1.85								.05 (2)
Pumpkinseed	10.19	1.13	.61	.35	.22		1.20	1.49	.76 (31)
Suckers			.12				.24	1.49	.07 (3)
Total	100.00 (108)	100.00 (265)	100.00 (823)	100.00 (862)	100.00 (1345)	100.00 (180)	100.00 (418)	100.00 (67)	100.00 (4065)

Table 11a. Overall Catch Rate of all Anglers Fishing for all Species in Selected Ramsey County Lakes During May 18 - October 31, 1974. Results are in Fish per Man-Hour, with Total Actual Number of Fish Caught in Parenthesis (*October not Included)

<u>Species</u>	<u>Island*</u>	<u>Johanna</u>	<u>Josephine*</u>	<u>Loeb*</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>
Northern			.116 (5)		.023 (16)	.008 (2)	.013 (4)	.030 (11)
Bl. Crappie		.031 (7)			.006 (4)	.049 (12)	.030 (9)	.082 (34)
Wh. Crappie						tr. (1)		
Bluegill		.480 (107)	.023 (1)	.224 (7)	.006 (4)	.638 (155)	.155 (47)	.361 (134)
Pumpkinseed		.009 (2)				.008 (2)		.378 (140)
L.M. Bass		.018 (4)			.013 (9)	.095 (23)	.020 (6)	.062 (23)
Walleye					tr. (1)			
Gr. Sunfish								.005 (2)
Perch			.023 (1)		tr. (2)	tr. (1)	tr. (1)	
Bl. Bullhead	.160 (5)	.005 (1)		.256 (8)	.091 (65)		.007 (2)	.043 (16)
Br. Bullhead	.032 (1)	.027 (6)			tr. (1)			.057 (21)
Yel. Bullhead								
Carp			.023 (1)		.015 (11)			
Hybrid Sunfish								.016 (6)
Combined	.192 (6)	.570 (127)	.185 (8)	.479 (15)	.159 (113)	.806 (196)	.228 (69)	1.045 (387)

Table 12a. Overall Catch Rate of all Anglers Fishing for all Species in Minneapolis Lakes During May 18 - October 31, 1974. Results are in Fish per Man-Hour, with Total Actual Number of Fish in Parenthesis (*October not Included)

<u>Species</u>	<u>Wirth*</u>	<u>Brownie*</u>	<u>Cedar</u>	<u>Lk. Isles*</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis*</u>	<u>Hiawatha</u>
Northern			.005 (3)		.006 (5)	.029 (12)		.028 (11)
Black Crappie	.196 (33)	.033 (8)	.121 (70)	.358 (137)	.344 (299)	.186 (78)	.689 (316)	.041 (16)
White Crappie	.012 (2)							
Bluegill	.107 (18)	1.023 (245)	1.199 (691)	1.851 (709)	1.157 (1005)	.045 (19)	.041 (19)	.036 (14)
Pumpkinseed	.065 (11)	.013 (3)	.009 (5)	.008 (3)	tr. (3)		.011 (5)	tr. (1)
L.M. Bass	.024 (4)	.07 (4)	.033 (19)	.018 (7)	.016 (14)	.091 (38)	.006 (3)	
S.M. Bass								tr. (1)
Gr. Sunfish	.006 (2)	tr. (1)	tr. (1)					tr. (1)
Perch	.166 (28)	tr. (1)	.056 (32)	.005 (2)	.021 (18)	.038 (16)	.109 (50)	.018 (7)
Bl. Bullhead	.053 (9)					.010 (4)	.039 (18)	.023 (9)
Br. Bullhead			tr. (1)		tr. (1)	.022 (9)	.004 (2)	.005 (2)
Yel. Bullhead						.010 (4)		tr. (1)
Suckers			tr.(1)				tr. (1)	tr. (1)
Carp	.006 (1)	.013 (3)		.010 (4)			.009 (4)	.010 (3)
Hybrid Sunfish	--	--	--	--	--	--	--	--
Combined	.635 (108)	1.107 (265)	1.428 (823)	2.250 (862)	1.548 (1345)	.430 (180)	.911 (418)	.170 (67)

Table 13a. Number of Fish per Man-Hour for Specified Method or Lure for Minneapolis Lakes, May 18 - October 31, 1974.
Actual Number of Fish Caught Appears in Parenthesis

Species	Still	Troll	Cast	Jig	Mixed	Artificial	Natural	Prepared	Mixed
Northern	.006	.158	.022		.021	.024	.007	--	.006
Walleye	--	--	--	--	--	--	--	--	--
Bl. Crappie	.254	--	.367	1.260	.219	.461	.237	--	.314
Wh. Crappie	.001	--	--	--	--	--	.001	--	--
Bluegill	.863	--	.259	.321	.332	.192	.885	3.000	.679
Pumpkinseed	.010	--	.003	--	--	.002	.011	--	.003
Gr. Sunfish	.002	--	--	--	--	--	.002	--	--
Hybrid Sunfish	--	--	--	--	--	--	--	--	--
L.M. Bass	.019	.158	.042	--	.113	.022	.023	--	.051
Perch	.050	--	.003	--	.021	.002	.055	--	.012
Bl. Bullhead	.013	--	--	--	--	--	.014	--	--
Br. Bullhead	.004	--	--	--	--	--	.004	--	--
Yellow Bullhead	.002	--	--	--	--	--	.002	--	--
Carp	.004	--	.006	--	--	.007	.004	--	--
Suckers	.001	--	--	--	--	--	.001	--	--
S.M. Bass	--	--	--	--	.007	--	--	--	.003
Numbers Caught	(3,675)	(6)	(220)	(64)	(101)	(322)	(3,383)	(3)	(357)
Hours Fished	2,989.66	18.95	313.23	40.47	141.36	453.61	2,714.93	1.0	334.16
Catch/Man-Hour	1.229	.316	.702	1.581	.714	.710	1.246	3.000	1.068

Table 14a. Number of Fish per Man-Hour for Specified Method or Lure for Selected Ramsey County Lakes,
May 18 - October 31, 1974. Actual Number of Fish Caught Appears in Parenthesis

<u>Species</u>	<u>Still</u>	<u>Troll</u>	<u>Cast</u>	<u>Jig</u>	<u>Mixed</u>	<u>Artificial</u>	<u>Natural</u>	<u>Prepared</u>	<u>Mixed</u>
Northern	.016	.038	.016	--	.034	.018	.017	--	.030
Walleye	.001	--	--	--	--	--	.001	--	--
Bl. Crappie	.040	--	.009	--	.037	.056	.026	--	.043
Wh. Crappie	.001	--	--	--	--	--	.001	--	--
Bluegill	.333	.094	.019	--	.048	.018	.324	--	.073
Pumpkinseed	.102	--	.003	--	.037	.003	.095	--	.060
Gr. Sunfish	.002	--	--	--	--	--	.002	--	--
Hybrid Sunfish	.002	--	--	--	.014	--	.002	--	.013
L.M. Bass	.020	.038	.063	--	.058	.050	.023	--	.060
Perch	.002	--	.006	--	--	.006	.002	--	--
Bl. Bullhead	.070	--	--	--	.017	--	.073	--	--
Br. Bullhead	.016	--	.003	--	.024	.003	.016	--	.023
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Carp	.009	--	--	--	--	.003	.010	--	--
Suckers	--	--	--	--	--	--	--	--	--
Numbers Caught	(794)	(9)	(38)	--	(79)	(53)	(778)	--	(91)
Hours Fished	1,291.7	52.9	317.8	1.0	293.7	339.8	1,316.8	--	300.5
Catch/Man-Hr.	.614	.170	.119	--	.269	.156	.591	--	.303

Table 15a. Number of Fish Caught per Man-Hour and Actual Numbers of Fish Caught in Parenthesis.
Bank Fishing, May 18 - October 31, 1974. Minneapolis Lakes

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern	--	--	.004	--	.013	.040	--	.018	.009
Bl. Crappie	.620	.034	.113	.354	.265	.018	.909	.036	.252
Wh. Crappie	.052	--	--	--	--	--	--	--	.001
Bluegill	.233	1.013	1.247	1.839	1.365	.031	.058	.036	.919
Pumpkinseed	.026	.013	.002	.008	.013	--	.021	.004	.008
Gr. Sunfish	--	.004	.002	--	--	--	--	--	.001
L.M. Bass	--	.017	.026	.018	.017	.063	.012	--	.022
S.M. Bass	--	--	--	--	--	--	--	.004	.0005
Perch	.181	.004	.066	.005	.004	.022	.041	.004	.028
Bl. Bullhead	.181	--	--	--	--	.009	.045	.036	.014
Br. Bullhead	--	--	.002	--	--	.027	.004	.004	.004
Yellow Bullhead	--	--	--	--	--	.018	--	--	.002
Suckers	--	--	.002	--	--	--	.004	.004	.002
Carp	--	.013	--	.011	--	--	.017	.014	.007
Numbers Caught	(50)	(257)	(687)	(852)	(386)	(51)	(270)	(36)	(2,589)
Hours Fished	38.7	234.0	469.1	381.1	230.1	223.8	243.1	221.3	2,041.2
Catch/Man-Hr.	1.292	1.098	1.464	2.236	1.677	.228	1.111	.162	1.268

Table 16a. Number of Fish Caught per Man-Hour, and Actual Numbers of Fish Caught in Parenthesis.
Bank Fishing, May 18 - October 31, 1974. Ramsey County Lakes

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern	--	--	111	--	.017	--	.011	--	.016
Walleye	--	--	--	--	--	--	--	--	--
Bl. Crappie	--	--	--	--	--	--	.026	--	.007
Wh. Crappie	--	--	--	--	--	--	--	--	--
Bluegill	--	.127	.023	.224	.004	1.519	.173	.216	.169
Pumpkinseed	--	.012	--	--	--	.016	--	.366	.018
Gr. Sunfish	--	--	--	--	--	--	--	--	--
L.M. Bass	--	.012	--	--	.013	.032	.018	.086	.017
Hybrid Sunfish	--	--	--	--	--	--	--	--	--
Perch	--	--	.023	--	--	--	.004	--	.002
Bl. Bullhead	.171	.012	--	.256	.024	--	.007	.022	.027
Br. Bullhead	--	--	--	--	--	--	--	--	--
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Suckers	--	--	--	--	--	--	--	--	--
Carp	--	--	.023	--	--	--	--	--	.001
Numbers Caught	(5)	(14)	(8)	(15)	(27)	(99)	(65)	(32)	(265)
Hours Fished	29.3	86.7	43.2	31.3	460.4	63.2	270.9	46.4	1,031.4
Catch/Man-Hr.	.171	.162	.185	.479	.059	1.569	.240	.690	.257

Table 17a. Number of Fish Caught per Man-Hour, and Actual Numbers of Fish Caught in Parenthesis.
Pier Fishing, May 18 - October 31, 1974. Minneapolis Lakes

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern	--	--	.011	--	.003	.006	--	.041	.008
Bl. Crappie	.072	--	.181	--	.375	.432	.440	.047	.312
Wh. Crappie	--	--	--	--	--	--	--	--	--
Bluegill	.072	--	.926	--	1.089	.070	.023	.035	.574
Pumpkinseed	.080	--	.042	--	--	--	--	--	.010
Gr. Sunfish	.016	--	--	--	--	--	.005	.006	.003
L.M. Bass	.032	--	.032	--	.016	.093	--	--	.023
S.M. Bass	--	--	--	--	--	--	--	--	--
Perch	.169	--	.01	--	.027	.064	.185	.035	.068
Bl. Bullhead	.016	--	--	--	--	.012	.028	.006	.008
Br. Bullhead	--	--	--	--	.002	--	.005	.006	.002
Yellow Bullhead	--	--	--	--	--	--	--	.006	.001
Suckers	--	--	--	--	--	--	--	--	--
Carp	.008	--	--	--	--	--	--	--	.001
Numbers Caught	(58)	--	(113)	--	(959)	(116)	(148)	(31)	(1,425)
Hours Fished	124.4	--	93.9	--	634.3	171.3	215.7	172.2	1,411.8
Catch/Man-Hr.	.466	--	1.203	--	1.512	.677	.686	.180	1.010

Table 18a. Number of Fish Caught per Man-Hour, and Actual Numbers of Fish Caught in Parenthesis.
Pier Fishing, May 18 - October 31, 1974. Ramsey County Lakes

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern	--	--	--	--	.040	--	--	--	.036
Walleye	--	--	--	--	.008	--	--	--	.007
Bl. Crappie	--	--	--	--	--	--	.192	--	.015
Wh. Crappie	--	--	--	--	--	--	--	--	--
Bluegill	--	--	--	--	--	--	--	--	--
Pumpkinseed	--	--	--	--	--	--	--	--	--
Gr. Sunfish	--	--	--	--	--	--	--	--	--
L.M. Bass	--	--	--	--	.024	--	--	--	.022
Hybrid Sunfish	--	--	--	--	--	--	--	--	--
Perch	--	--	--	--	.016	--	--	--	.015
Bl. Bullhead	--	--	--	--	.422	--	--	--	.384
Br. Bullhead	.500	--	--	--	.008	--	--	--	.015
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Suckers	--	--	--	--	--	--	--	--	--
Carp	--	--	--	--	.048	--	--	--	.043
Numbers Caught	(1)	--	--	--	(71)	--	(2)	--	(74)
Hours Fished	20	--	--	--	125.6	--	10.4	--	138.0
Catch/Man-Hr.	.500	--	--	--	.565	--	.192	--	.536

Table 19a. Number of Fish Caught per Man-Hour, and Actual Numbers of Fish Caught in Parenthesis.
Boat Fishing, May 18 - October 31, 1974. Minneapolis Lakes

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern	--	--	--	--	--	.085	--	--	.039
Bl. Crappie	--	--	--	1.010	--	--	--	--	.039
Wh. Crappie	--	--	--	--	--	--	--	--	--
Bluegill	--	1.455	1.863	4.040	--	--	--	--	.691
Pumpkinseed	--	--	--	--	--	--	--	--	--
Gr. Sunfish	--	--	--	--	--	--	--	--	--
L.M. Bass	--	--	.392	--	--	.340	--	--	.237
S.M. Bass	--	--	--	--	--	--	--	--	--
Perch	--	--	--	--	--	--	--	--	--
Bl. Bullhead	--	--	--	--	--	--	--	--	--
Br. Bullhead	--	--	--	--	--	--	--	--	--
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Suckers	--	--	--	--	--	--	--	--	--
Carp	--	--	--	--	--	--	--	--	--
Numbers Caught	--	(8)	(23)	(10)	--	(10)	--	--	(51)
Hours Fished	5.5	5.5	10.2	1.98	4.0	23.5	--	--	50.68
Catch/Man-Hr.	--	1.455	2.255	5.050	--	.425	--	--	1.006

Table 20a. Number of Fish Caught per Man-Hour, and Actual Numbers of Fish Caught in Parenthesis.
Boat Fishing, May 18 - October 31, 1974. Ramsey County Lakes

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern	--	--	--	--	.024	.011	.047	.034	.022
Walleye	--	--	--	--	--	--	--	--	--
Bl. Crappie	--	.051	--	--	.032	.067	--	.105	.072
Wh. Crappie	--	--	--	--	--	.006	--	--	.001
Bluegill	--	.706	--	--	.016	.328	--	.383	.356
Pumpkinseed	--	.007	--	--	--	.006	--	.380	.159
Gr. Sunfish	--	--	--	--	--	--	--	.006	.003
L.M. Bass	--	.022	--	--	--	.117	.047	.059	.056
Hybrid Sunfish	--	--	--	--	--	--	--	.019	.008
Perch	--	--	--	--	--	.006	--	--	.001
Bl. Bullhead	--	--	--	--	--	--	--	.046	.019
Br. Bullhead	--	.044	--	--	--	--	--	.065	.034
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Suckers	--	--	--	--	--	--	--	--	--
Carp	--	--	--	--	.048	--	--	--	.006
Numbers Caught	--	(113)	--	--	(14)	(97)	(2)	(355)	(581)
Hours Fished	2.0	136.0	--	--	124.9	179.7	21.1	324.0	787.7
Catch/Man-Hr.	--	.831	--	--	.120	.541	.094	1.095	.738

Table 21a. Estimated Catch in Numbers and Pounds (In Parenthesis) for Minneapolis Lakes,
May 18 - October 31, 1974

	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern Pike	-- --	-- --	149 (609.2)	-- --	271 (947.5)	325 (1,341.7)	-- --	437 (753.7)	1,182 (3,652.1)
Bl. Crappie	1,442 (338.7)	166 (35.6)	2,271 (454.2)	7,174 (1,929.2)	8,574 (1,929.1)	1,778 (517.5)	10,021 (2,319.5)	1,031 (271.8)	32,457 (7,795.6)
Wh. Crappie	69 (41.0)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	69 (41.0)
Bluegill	534 (89.2)	5,322 (1,044.1)	14,311 (3,062.6)	20,519 (4,490.9)	20,983 (5,077.9)	510 (127.4)	489 (103.6)	276 (56.9)	62,944 (14,052.6)
Pumpkinseed	335 (64.4)	78 (5.2)	69 (9.5)	140 (19.4)	63 (12.9)	-- --	128 (18.4)	13 (1.6)	826 (131.4)
Gr. Sunfish	68 (11.7)	17 (2.1)	22 (3.5)	-- --	-- --	-- --	-- --	14 (.9)	121 (18.2)
L.M. Bass	68 (44.3)	69 (44.2)	346 (464.3)	160 (81.6)	281 (207.2)	857 (437.0)	55 (29.8)	-- --	1,836 (1,314.4)
S.M. Bass	-- --	-- --	-- --	-- --	-- --	-- --	-- --	14 (20.8)	14 (20.8)
Perch	665 (106.0)	39 (2.5)	697 (88.5)	48 (10.1)	293 (53.8)	554 (77.0)	1,112 (167.4)	95 (21.1)	3,513 (526.4)
Bl. Bullhead	627 (156.1)	-- --	-- --	-- --	-- --	116 (42.6)	505 (201.5)	202 (40.7)	1,450 (440.9)
Br. Bullhead	-- --	-- --	22 (11.1)	-- --	22 (22.2)	160 (66.8)	48 (24.0)	28 (78.2)	252 (142.3)
Yellow Bullhead	-- --	-- --	-- --	-- --	-- --	116 (99.8)	-- --	14 (3.5)	130 (103.3)
Suckers	-- --	-- --	21 (36.9)	-- --	-- --	-- --	24 (21.3)	9 (7.8)	54 (66.0)
Carp	204 (254.7)	57 (93.2)	-- --	97 (583.0)	-- --	-- --	110 (440.1)	52 (262.0)	520 (1,633.0)
Total	4,012 (1,106.1)	5,748 (1,226.9)	17,908 (4,739.8)	28,138 (7,120.2)	30,487 (8,250.6)	4,416 (2,709.8)	12,492 (3,325.6)	2,185 (1,459.0)	105,385 (29,938.8)

Table 22a. Estimated Catch in Numbers and Pounds (In Parenthesis) for Selected Ramsey County Lakes,
May 8 - October 31, 1974

	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern	-- --	-- --	161 (740.6)	-- --	304 (828.0)	64 (166.8)	66 (237.1)	266 (360.8)	861 (2,373.3)
Walleye	-- --	-- --	-- --	-- --	15 (57.5)	-- --	-- --	-- --	15 (57.5)
Bl. Crappie	-- --	142 (24.2)	-- --	-- --	40 (21.8)	371 (85.0)	420 (84.4)	824 (219.3)	1,797 (434.7)
Wh. Crappie	-- --	-- --	-- --	-- --	-- --	37 (25.3)	-- --	-- --	37 (25.3)
Bluegill	-- --	2,635 (474.3)	42 (15.7)	180 (79.9)	118 (29.5)	3,495 (685.1)	1,643 (264.5)	2,371 (505.0)	10,484 (2,054.0)
Pumpkinseed	-- --	53 (11.6)	-- --	-- --	-- --	74 (12.7)	-- --	2,511 (647.9)	2,638 (672.2)
Gr. Sunfish	-- --	-- --	-- --	-- --	-- --	-- --	-- --	40 (8.0)	40 (8.0)
L.M. Bass	-- --	83 (70.7)	-- --	-- --	122 (102.8)	546 (690.2)	154 (161.4)	386 (351.7)	1,291 (1,376.8)
Hybrid Sunfish	-- --	-- --	-- --	-- --	-- --	-- --	-- --	114 (21.3)	114 (21.3)
Perch	-- --	-- --	42 (5.2)	-- --	39 (4.8)	37 (11.5)	23 (4.6)	-- --	141 (26.1)
Bl. Bullhead	147 (22.0)	89 (38.7)	-- --	191 (95.6)	1,813 (335.4)	-- --	46 (23.0)	250 (68.7)	2,536 (583.4)
Br. Bullhead	9 (7.5)	101 (25.3)	-- --	-- --	-- --	-- --	-- --	436 (171.2)	546 (204.0)
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Suckers	--	--	--	--	--	--	--	--	--
Carp	-- --	-- --	26 (25.9)	-- --	173 (450.9)	-- --	-- --	-- --	199 (476.8)
Total	156 (29.5)	3,103 (694.8)	271 (827.4)	371 (175.5)	2,624 (1,830.7)	4,624 (1,676.6)	2,352 (775.0)	7,198 (2,353.9)	20,699 (8,777.1)

Table 23a. Estimated Harvest of Each Species and Combination of Species in Selected Ramsey County Lakes
During May 18 - October 31, 1974. Results are in Estimated Pounds per Acre

<u>Species</u>	<u>Island</u>	<u>Johanna</u>	<u>Josephine</u>	<u>Loeb</u>	<u>Long</u>	<u>Owasso</u>	<u>Phalen</u>	<u>Snail</u>	<u>Total</u>
Northern	--	--	6.615	--	4.682	.478	1.258	2.280	1.889
Bl. Crappie	--	.120	--	--	.123	.243	.447	1.386	.346
Wh. Crappie	--	--	--	--	--	.075	--	--	.020
Bluegill	--	2.365	.133	8.50	.166	1.963	1.403	3.190	1.634
Pumpkinseed	--	.057	--	--	--	.036	--	4.095	.535
L.M. Bass	--	.352	--	--	.582	1.976	.856	2.223	1.096
Walleye	--	--	--	--	.325	--	--	--	.046
Gr. Sunfish	--	--	--	--	--	--	--	.051	.006
Perch	--	--	.045	--	.027	.033	.024	--	.021
Bl. Bullhead	.391	.193	--	10.17	1.90	--	.122	.447	.464
Br. Bullhead	.132	.126	--	--	--	--	--	1.087	.162
Yellow Bullhead	--	--	--	--	--	--	--	--	--
Carp	--	--	.217	--	2.55	--	--	--	.379
Hybrid Sunfish	--	--	--	--	--	--	--	.134	.017
Combined	.523	3.213	7.009	18.67	10.353	4.804	4.11	14.893	6.615

Table 24a. Estimated Harvest of Each Species and Combination of Species in Minneapolis Lakes during May 18 - October 31, 1974. Results are in Estimated Pounds Per Acre

<u>Species</u>	<u>Wirth</u>	<u>Brownie</u>	<u>Cedar</u>	<u>Lk. Isles</u>	<u>Calhoun</u>	<u>Harriet</u>	<u>Nokomis</u>	<u>Hiawatha</u>	<u>Total</u>
Northern	--	--	3.61	--	2.12	3.89	--	14.09	2.66
Bl. Crappie	8.89	3.49	2.69	17.70	4.31	1.50	11.39	5.08	5.67
Wh. Crappie	1.08	--	--	--	--	--	--	--	.030
Bluegill	2.35	102.36	18.15	41.20	11.35	.37	.51	1.06	10.23
Pumpkinseed	1.69	.51	.06	.18	.03	--	.09	.03	.096
L.M. Bass	1.16	4.33	2.75	.80	.46	1.27	.15	--	.957
S.M. Bass	--	--	--	--	--	--	--	.39	.015
Gr. Sunfish	.31	.21	.02	--	--	--	--	.02	.013
Perch	2.79	.24	.52	.09	.12	.22	.82	.39	.383
Bl. Bullhead	4.00	--	--	--	--	.12	.99	.76	.321
Br. Bullhead	--	--	.07	--	.05	.19	.12	.34	.103
Yellow Bullhead	--	--	--	--	--	.29	--	.06	.075
Suckers	--	--	.22	--	--	--	.10	.14	.048
Carp	6.68	9.13	--	5.35	--	--	2.16	4.90	1.188
Hybrid Sunfish	--	--	--	--	--	--	--	--	--
Combined	28.95	120.27	28.09	65.32	18.44	7.85	16.81	26.92	21.79

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