

Original: Fish Division
cc: Education-Game
Mr. Krumholz
Institute for Fisheries Research

INSTITUTE FOR FISHERIES RESEARCH

DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

June 19, 1945

REPORT NO. 1009

REPORT OF THE GENERAL CREEL CENSUS FOR 1944

by

Louis A. Krumholz

Introduction

The report of the general creel census for 1944, the eighteenth year in which such data have been gathered by the conservation officers, includes information on the quality of fishing in the various types of lakes and streams throughout the state. In this report the data from trout lakes and streams, non-trout lakes and streams, and the Great Lakes and connecting waters have been considered separately for the first time. The reason for this separate consideration of the data is to give a better indication of the quality and relative amount of fishing in these six general types of water administered by the state. The data on the average lengths of fish taken has been omitted in the report for 1944 because such data are based on estimates by the officers who rarely make actual measurements of the fish taken by the anglers. These inexact data add little to the general creel census and their compilation requires considerable time.

During 1943 there were no records submitted from 8 counties: Arenac, Bay, Iosco, Kalkaska, Mason, Mecosta, Osceola, and Sanilac, whereas in 1944 there were reports from every county in the state with the exception of Kalkaska. This county contains some very fine trout and non-trout water and records of the fishing would add considerably to the general census.

This report will follow that for 1942 to facilitate making any comparisons which may be desired. As in other years, no records of intensive lake or stream censuses have been included. The term "fisherman-day" denotes only the time the angler spent fishing prior to being interviewed by the conservation officer. Only those fish which had reached legal size have been considered.

During 1944 the conservation officers interviewed 46,100 anglers who fished 152,196.5 hours on various types of waters throughout the state and who took 177,262 fish at a rate of 1.16 fish per hour (Table 1). This catch per hour, although the same as in 1943, includes the angling efforts of 11,624 more anglers than during the previous year. The greatest number of records gathered by the officers (46,174 records in 1942) is only 74 records more than that of 1944.

Table 1

Total number of fishermen, total hours fished, total number of legal-sized fish taken, and catch per hour for each hatchery district, all waters, 1944

District	Number of fishermen	Total hours fished	Number of legal-sized fish caught	Catch per hour
1	4,418	18,358.4	11,352	0.62
2	4,959	18,733.6	16,831	0.90
3	3,060	8,790.2	12,102	1.38
4	2,671	7,465.6	9,368	1.25
5	7,450	22,526.9	14,288	0.63
6	1,449	4,384.2	4,989	1.14
7	2,018	6,521.2	8,382	1.29
8	3,489	10,991.2	14,904	1.36
9	3,701	10,787.5	18,177	1.69
10	3,105	8,596.0	12,388	1.44
11	9,780	35,041.7	54,481	1.55
Total or average	46,100	152,196.5	177,262	1.16

The records of fishing in all types of water has been divided into three main categories, trout waters, non-trout waters, and Great Lakes waters, and these in turn have been subdivided into lakes and streams. All artificially impounded waters have been considered as lakes. In the waters of the Great Lakes, the fishing done in Lakes Superior, Michigan, Huron, and Erie have been considered as lake fishing, whereas that in the connecting waters, as defined by law, has been considered as stream fishing. The number of anglers interviewed on each of these different types of waters follows: trout waters, 7,588 anglers of whom 708 fished on designated trout lakes and 6,880 fished on streams; non-trout waters, 33,702 anglers of whom 28,717 fished on lakes and the remaining 4,985 fished on streams; Great Lakes waters, 4,810 anglers of whom 2,713 fished in the Great Lakes and the other 2,097 fished in the connecting waters.

Of the 46,100 anglers interviewed during 1944, 5,226 (11.3 per cent) were non-residents and 6,957 (15.7 per cent) were women.

DETAILED ANALYSIS

During 1944 conservation officers obtained records from 46,100 anglers, an increase of 11,624 (33.7 per cent) from the 34,476 records collected in 1943, and only 74 records fewer than the largest number in the history of the general census (46,174 records in 1942). These records represented 152,196.5 hours of fishing, an increase of 48,767.1 hours (47.2 per cent) over that of 1943 and 879.5 hours more than recorded in 1942, the highest previous year. The number of fish recorded in 1944 was 177,262, an increase of 57,666 fish (48.2 per cent) over that of 1943 and 3,824 fish more than were recorded in 1942. The catch per hour in 1944 (1.16 fish per hour) was identical with that of 1943.

During 1944 no creel census records were submitted from Kalkaska County. This represents a decrease of 7 "blank" counties from the census of 1943 and 1 fewer than that of 1942 when only 2 counties were not represented. In addition to Kalkaska County there were 2 counties from which fewer than 100 records were received as follows: Bay 82, Arenac 95. In 1943 there were 15 counties from which fewer than 100 records were submitted. The goal of 400 records per county was attained by the following 46 counties in 1944: Alcona, Allegan, Antrim, Barry, Berrien, Branch, Cass, Charlevoix, Cheboygan, Chippewa, Delta, Dickinson, Emmet, Genesee, Gladwin, Gogebic, Houghton, Huron, Ionia, Iron, Jackson, Kent, Lapeer, Leelanau, Lenawee, Livingston, Mackinac, Macomb, Manistee, Marquette, Menominee, Monroe, Montcalm, Montmorency, Oakland, Ogemaw, Ontonagon, Oscoda, Ottawa, Roscommon, St. Clair, Schoolcraft, Van Buren, Washtenaw, Wayne, and Wexford. This list includes 16 counties which had not submitted 400 records in 1943 as follows: Alcona, Berrien, Cass, Charlevoix, Chippewa, Emmet, Gladwin, Houghton, Macomb, Menominee, Montmorency, Ogemaw, Ontonagon, St. Clair, Schoolcraft, and Van Buren. However, in 1943, 5 counties which sent in more than 400 records (Benzie, Clinton, Grand Traverse, Kalamazoo, and St. Joseph) in 1943 failed to do so in 1944.

Roscommon County again heads the list in the number of records submitted with a total of 4,433 and is followed in order by Gogebic (1,813 records), Jackson (1,701 records), Iron (1,452 records), St. Clair (1,208 records), Oakland (1,182 records), and Kent (1,105 records) counties.

Fishing in Trout, Non-trout, and Great Lakes waters
by Hatchery Districts

Of the 46,100 fisherman-days recorded in the 1944 general creel census, 7,588 (16.5 per cent) were from trout waters, 33,702 (73.1 per cent) were from non-trout waters, and 4,810 (10.4 per cent) were from Great Lakes waters (Table 2).

Table 2

Numbers and percentages of fishermen interviewed on trout, non-trout, and Great Lakes waters by hatchery districts, 1944

District	TROUT WATERS		NON-TROUT WATERS		GREAT LAKES WATERS	
	Number of fishermen	Percentage of fishermen	Number of fishermen	Percentage of fishermen	Number of fishermen	Percentage of fishermen
1	1,961	44.39	2,430	55.00	27	0.61
2	2,146	43.29	1,869	37.68	944	19.03
3	816	26.67	2,140	69.93	104	3.40
4	436	16.32	2,179	81.58	56	2.10
5	709	9.52	6,711	90.08	30	0.40
6	178	12.28	1,141	78.74	130	8.97
7	562	27.85	1,456	72.15	...	...
8	253	7.25	3,236	92.75	...	...
9	182	4.92	3,517	95.03	2	0.05
10	20	0.64	3,085	99.36	...	...
11	325	3.32	5,938	60.72	3,517	35.96
Total or percentage	7,588	16.46	33,702	73.10	4,810	10.43

The greatest percentage of records for trout fishing was recorded from Hatchery District 1, where 44.4 per cent of the 4,418 anglers in that district fished in trout waters. District 1 was followed in order by District 2 with 43.3 per cent based on 4,959 records and District 7 with 27.9 per cent based on 2,018 records. The seven hatchery districts north of the Bay City-Muskegon line furnished 89.7 per cent of all the trout fishing in the state during 1944, whereas in 1943 and 1942 this same area furnished 92.0 and 97.3 per cent respectively. Also the trout fishing in this area constituted 26.2 per cent of all the fishing in the area during 1944 as compared with 24.0 and 20.6 per cent during 1943 and 1942 respectively.

As in the past two years, Hatchery District 10 furnished the greatest percentage of non-trout fishing records with 99.4 per cent based on 3,105 fisherman-days. District 10 was followed in order, as in 1943 and 1942, by Districts 9 with 95.0 per cent based on 3,701 records and District 8 with 92.8 per cent based on 3,489 records.

Records of fishing in the Great Lakes were submitted from 8 hatchery districts in 1944 as compared with 6 in 1943. As in 1943, District 11 furnished the greatest percentage with 36.0 per cent based on 9,780 records.

Quality of Fishing

The best general indication of the quality of fishing is the catch per unit of fishing effort. As in past reports of the General Creel Census, the catch per hour is the unit used during 1944. There is considerable variation in the catch per hour with the kind of fishing done. The highest catch per hour (1.69 fish) during 1944 was in District 9 (Tables 1 and 3), where the vast majority of the fishing was done in non-trout waters. The southern third of the state usually offers the best fishing in numbers of fish taken per hour (Table 3). Fishing in the counties south of the Bay City-Muskegon line furnished a catch of 1.5 pan fish per hour, whereas those north of that line furnished a catch of only 0.9 fish per hour.

Table 3

Catch per hour for all waters by hatchery districts

District	1938	1939	1940	1941	1942	1943	1944
1	0.6	0.6	0.5	0.7	0.6	1.1	0.6
2	1.1	1.1	1.4	1.1	1.4	0.9	0.9
3	1.0	1.2	0.8	0.9	0.9	1.1	1.4
4	1.5	1.1	1.1	1.1	1.9	1.5	1.3
5	1.1	0.9	0.8	0.7	0.6	0.7	0.6
6	1.1	1.0	0.7	0.7	0.6	0.6	1.1
7	1.5	1.3	1.2	1.1	1.6	1.4	1.3
8	1.4	1.4	1.3	1.5	1.0	1.2	1.4
9	2.0	1.3	1.3	1.3	1.4	1.4	1.7
10	1.8	1.5	1.5	1.5	1.4	1.3	1.4
11	1.6	0.9	1.3	1.2	1.4	1.4	1.6
State average	1.3	1.1	1.0	1.0	1.1	1.2	1.2

Furthermore, 99,950 (56.4 per cent) of the total 177,262 fish recorded in the census were taken from the waters in the southern third of the state.

Catch per Hour--Trout Waters,
by Hatchery Districts

For the second consecutive year there have been records of trout fishing from all of the 11 hatchery districts. Trout fishermen (16.5 per cent of all anglers) had slightly poorer fishing in 1944 than they did in 1943 (Table 4).

Table 4

Catch per hour--trout waters, by hatchery districts

District	1938	1939	1940	1941	1942	1943	1944
1	0.9	0.8	0.8	0.7	1.1	1.0	0.7
2	1.1	1.2	1.1	1.1	1.0	0.9	0.8
3	0.8	1.0	0.7	0.8	1.0	0.8	0.9
4	0.8	0.7	0.6	0.7	1.0	1.3	1.0
5	0.6	0.5	0.6	0.6	0.6	0.6	0.8
6	1.2	1.0	0.4	0.8	0.3	0.6	0.7
7	0.9	1.0	0.8	0.8	1.0	1.0	0.9
8	0.4	1.2	0.2	0.3	0.7	0.9	0.7
9	0.8	0.6	...	0.7	0.6	0.7	0.5
10	1.8	1.1	0.5	1.1	...	0.9	0.8
11	...	0.1	0.2	0.6	0.7	1.9	0.6
State average	0.9	0.8	0.8	0.8	0.9	0.9	0.8

As previously mentioned, trout waters have been divided into trout lakes and streams, and the catch per hour in trout lakes was slightly better than in the streams (Table 5). However, the majority (90.7 per cent) of trout fishermen fished in streams. As may be expected, more trout fishing (54.1 per cent) was done in the Upper Peninsula than anywhere else in the state.

Trout fishing, as shown by the catch per hour, was best in District 4 and followed in order by Districts 3, 7, and 2 (Table 5). In the trout lakes, which occur mainly in the northern part of the state, the highest catch per hour was recorded from District 7. All of these records came from Clare County and bluegills made up the majority of the fish taken.

Table 5

General creel census data for trout lakes, trout streams, and
all trout waters combined, by hatchery districts, 1944

District	TROUT LAKES				TROUT STREAMS				ALL TROUT WATERS			
	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour
1	135	605.8	714	1.18	1,826	7,463.4	5,220	0.70	1,961	8,069.2	5,934	0.74
2	404	1,631.8	1,334	0.82	1,742	6,428.0	5,241	0.82	2,146	8,059.8	6,575	0.82
3	92	420.5	268	0.64	724	2,192.1	2,032	0.93	816	2,612.6	2,300	0.88
4	...	...	...	...	436	1,261.0	1,280	1.02	436	1,261.0	1,280	1.02
5	44	161.5	43	0.27	665	2,219.2	1,777	0.80	709	2,380.7	1,820	0.76
6	...	...	...	...	178	526.2	388	0.74	178	526.2	388	0.74
7	33	150.5	259	1.72	529	1,853.7	1,464	0.79	562	2,004.2	1,723	0.86
8	...	...	...	...	253	807.8	506	0.69	253	807.8	506	0.69
9	...	...	...	...	182	527.6	287	0.54	182	527.6	287	0.54
10	...	...	...	...	20	54.2	44	0.81	20	54.2	44	0.81
11	...	...	...	...	325	888.5	572	0.64	325	888.5	572	0.64
Total or average	708	2,970.1	2,618	0.88	6,880	24,221.7	18,811	0.78	7,588	27,191.8	21,429	0.79

In the trout streams, the highest catch per hour was recorded in District 4 and followed in order by Districts 3, 2, 8, and 5. The high catch per hour in District 8 is to be attributed to the few fisherman-days recorded. These few were probably not representative.

Catch Per Hour--Non-Trout Waters,
by Hatchery Districts

The highest catch per hour recorded for non-trout waters in 1944 was 1.7 fish in District 9 (Table 6). This was followed in order by Districts 3, 7, 8, 10, and 11. The catch was less than 1 fish per hour in only 3 districts, and the overall catch for the entire state was 1.1 fish per hour, 0.1 fish per hour less than in 1943.

Table 6

Catch per hour--non-trout waters, by hatchery districts

District	1938	1939	1940	1941	1942	1943	1944
1	0.4	0.4	0.3	0.6	0.5	1.2	0.5
2	1.2	1.1	1.5	1.1	1.1	0.8	0.8
3	1.4	1.4	0.9	0.9	0.8	1.2	1.5
4	1.7	1.2	1.1	1.3	1.9	1.4	1.2
5	1.1	1.0	0.8	0.7	0.7	0.7	0.6
6	1.0	1.0	0.7	0.7	0.9	0.6	1.0
7	2.0	1.4	1.6	1.3	1.9	1.5	1.4
8	1.5	1.4	1.4	1.6	1.0	1.2	1.4
9	2.1	1.4	1.3	1.3	1.4	1.5	1.7
10	1.8	1.5	1.5	1.5	1.4	1.3	1.4
11	1.6	1.9	1.3	1.2	1.2	1.3	1.3
State average	1.4	1.1	1.0	1.1	1.1	1.2	1.1

Non-trout fishermen made up 73.1 per cent of all anglers in the state. Of these, 85.2 per cent fished in lakes and the remaining 14.8 per cent fished in streams. Lake fishing was best in District 9, where the anglers caught an average of 1.8 fish per hour (Table 7), and was followed in order by Districts 8 (1.6 fish per hour), 7 (1.6 fish per hour), 3 (1.5 fish per hour), and 10 (1.4 fish per hour).

Table 7

General creel census data for non-trout lakes, non-trout streams and all non-trout waters combined, by hatchery districts, 1944

District	NON-TROUT LAKES				NON-TROUT STREAMS				ALL NON-TROUT WATERS			
	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour
1	2,007	8,674.0	4,236	0.48	423	1,488.2	1,152	0.77	2,430	10,162.2	5,388	0.53
2	1,489	5,187.5	4,671	0.90	380	1,428.6	875	0.61	1,869	6,616.1	5,546	0.84
3	1,875	5,064.8	7,683	1.52	265	607.8	521	0.86	2,140	5,672.6	8,204	1.45
4	2,150	5,935.9	7,140	1.20	29	81.0	54	0.67	2,179	6,016.9	7,194	1.20
5	5,716	16,396.3	9,307	0.57	995	3,690.4	2,885	0.78	6,711	20,086.7	12,192	0.61
6	815	2,110.3	1,821	0.86	326	1,290.7	1,545	1.20	1,141	3,401.0	3,366	0.99
7	1,374	4,181.8	6,475	1.55	82	335.2	184	0.55	1,456	4,517.0	6,659	1.47
8	2,598	7,653.2	12,431	1.62	638	2,530.2	1,967	0.78	3,236	10,183.4	14,398	1.41
9	3,217	9,485.8	16,782	1.77	300	768.1	1,056	1.37	3,517	10,253.9	17,838	1.74
10	2,806	7,729.6	11,149	1.44	279	812.2	1,195	1.47	3,085	8,541.8	12,344	1.45
11	4,670	13,514.1	17,441	1.29	1,268	4,492.3	6,291	1.40	5,938	18,006.4	23,702	1.32
Total or average	28,717	85,933.3	99,106	1.15	4,985	17,524.7	17,725	1.01	33,702	103,458.0	116,831	1.13

The preponderance of trout stream fishing over that of lakes is to be expected because of the great preponderance of such streams. Furthermore, most trout fishermen seem to prefer fishing in streams, and trout are primarily stream fish. Similarly, most of the non-trout angling was done in lakes inasmuch as the majority of anglers for pan fish, especially bluegills and perch (which make up two-thirds of the total catch), find these fish are more readily taken in lakes than in streams.

Catch per Hour--Great Lakes Waters,
by Hatchery Districts

Although fishing in the Great Lakes has been considered separately from that in inland waters for only 3 years (including 1944), there is an indication that such fishing is much more productive than either of the two categories for inland waters (Table 8). Records of fishing in the Great Lakes were submitted from 8 districts in 1944 (District 10 is the only hatchery district which does not border on the Great Lakes).

Table 8
Catch per hour--Great Lakes waters,
by hatchery districts

District	1942	1943	1944
1	0.2	0.4	0.2
2	2.8	2.3	1.2
3	1.3	...	3.2
4	5.1	5.9	4.8
5	...	...	4.6
6	...	3.0	2.7
7	...	...	...
8	...	...	...
9	...	2.8	8.7
10	...	...	...
11	1.6	1.4	1.9
State average	1.7	1.6	1.8

The greatest success in fishing in Great Lakes waters was reported from District 9 (8.8 fish per hour), but this high catch is to be attributed to the very few anglers represented (Table 9). In 5 of the 8 districts from which records were submitted, the anglers experienced a catch of more than 2 fish per hour and the average for all Great Lakes waters was 1.8 fish.

The fishing in the Great Lakes proper (2.0 fish per hour) was better than in the connecting waters (1.6 fish per hour). Records were received from 8 districts on the Great Lakes and from the only 2 districts which have frontage on the connecting waters.

Number of Trout--

Trout Waters

As in other years, brook trout made up the majority (82.2 per cent) of all trout taken. Rainbow trout (10.8 per cent) and brown trout (7.0 per cent) made up the remainder of the trout catch (Table 10). These

Table 10

Number, and percentage of total trout catch made up by each of the three species of trout--trout waters, by hatchery districts, 1944

District	BROOK TROUT		RAINBOW TROUT		BROWN TROUT		Total trout
	Number	Percentage	Number	Percentage	Number	Percentage	
1	4,553	91.44	193	3.88	233	4.68	4,979
2	5,470	92.29	378	6.38	79	1.33	5,927
3	1,512	69.10	549	25.10	127	5.80	2,188
4	658	54.56	376	31.18	172	14.26	1,206
5	1,475	88.48	55	3.30	137	8.22	1,667
6	274	76.32	77	21.45	8	2.23	359
7	799	55.95	273	19.12	356	24.93	1,428
8	79	41.58	12	6.32	99	52.10	190
9	122	45.35	90	33.46	57	21.19	269
10	17	38.64	7	15.91	20	45.45	44
11	519	90.57	28	4.89	26	4.54	573
Total or percentage	15,478	82.20	2,038	10.82	1,314	6.98	18,830

figures show a slight decrease in the percentage of brook trout (84.2 per cent) and rainbow trout (11.5 per cent) taken in 1943 with a corresponding rise in the percentage of brown trout (4.5 per cent in 1943).

Table 9

General creel census data for the Great Lakes, connecting waters, and such waters combined, by hatchery districts, 1944

District	GREAT LAKES				CONNECTING WATERS				ALL GREAT LAKES WATERS			
	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour	Number of anglers	Total hours fished	Total legal fish taken	Catch per hour
1	27	127.0	30	0.24	...	...	...	...	27	127.0	30	0.24
2	476	2,134.5	2,456	1.15	465	1,923.2	2,254	1.16	944	4,057.7	4,710	1.15
3	104	505.0	1,598	3.16	...	...	...	...	104	505.0	1,598	3.16
4	56	187.7	893	4.76	...	...	...	...	56	187.6	893	4.76
5	30	59.5	276	4.64	...	...	...	...	30	59.5	276	4.64
6	130	457.0	1,235	2.70	...	...	...	...	130	457.0	1,235	2.70
7	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...
9	2	6.0	52	8.67	...	...	...	...	2	6.0	52	8.67
10	...	...	...	...	...	...	...	...	...	...	...	...
11	1,888	8,236.4	16,416	1.99	1,629	7,910.4	13,791	1.74	3,517	16,146.8	30,207	1.87
Total or average	2,713	11,713.1	22,956	1.96	2,097	9,833.6	16,045	1.63	4,810	21,546.7	39,001	1.81

The largest percentage of brook trout was taken in the Upper Peninsula, where these fish made up 91.9 per cent of the total trout catch. This is nearly half again as many as were reported in 1943 (64.5 per cent). In the northern half of the Lower Peninsula, brook trout made up 68.9 per cent of the total trout catch and constituted 68.5 per cent in the southern half of the Lower Peninsula.

Rainbow trout were most abundant in the catch in the Upper Peninsula (19.4 per cent) and made up 12.7 and 5.2 per cent in the northern and southern halves of the Lower Peninsula.

Brown trout were least abundant in the Upper Peninsula and became more abundant in the northern half (11.7 per cent) and southern half (18.8 per cent) of the Lower Peninsula. In only the southern half did the brown trout outnumber the rainbow trout.

Other Fish Taken

From Trout Waters

The three kinds of trout made up 88.1 per cent of all fish taken from trout waters. Twelve other kinds of fish were recorded from trout waters and are arranged in order of decreasing abundance as follows:

Yellow perch	939	Crappies	88
Suckers	454	Lake trout	77
Bluegill	351	Smallmouth bass	68
Rock bass	284	Bullheads	30
Northern pike	134	Largemouth bass	23
Yellow pikeperch	98	Pumpkinseeds	9

Composition of Catch--

Non-trout Waters

There were 29 different kinds of fish recorded in the catches from non-trout waters during 1944. Again, as in past years, bluegills were caught in greater numbers than any other fish in non-trout waters. Other important species were reported in the following order of abundance: yellow perch, crappies, pumpkinseeds, northern pike, yellow pikeperch,

rock bass, largemouth bass, smelt, and smallmouth bass. These 10 species made up 93.9 per cent of the total non-trout catch (Table 11) and the other 19 species made up the remaining 6.1 per cent. Included in this list of "other species" are brook, rainbow, and brown trout, which made up 0.1 per cent of the total catch from non-trout waters.

Table 11

Percentage composition of the total catch for non-trout waters
(most abundant game and pan fish only)

Kind of fish	1938	1939	1940	1941	1942	1943	1944
Bluegill	44.7	41.3	32.8	43.4	37.4	48.3	44.2
Yellow perch	17.4	22.2	28.3	24.6	23.8	17.8	21.1
Black crappie	3.0	3.4	5.0	5.1	5.8	8.3	5.8
Pumpkinseed	5.6	5.6	5.4	5.6	5.1	4.4	4.8
Northern pike	3.2	3.1	3.6	2.8	3.4	3.3	4.6
Yellow pikeperch	2.6	2.6	2.3	2.6	2.8	3.2	3.6
Rock bass	5.9	5.9	7.6	5.4	4.2	3.2	3.6
Largemouth bass	2.6	2.2	2.1	2.5	2.2	2.5	2.6
Smelt	...	...	5.2	2.1	10.4	1.8	1.8
Smallmouth bass	2.3	2.4	2.8	2.7	2.2	1.7	1.8
Total	87.3	88.7	95.1	96.8	97.4	94.5	93.9

A comparison of the abundance of the 10 most common species in the total catch from non-trout waters for the past 7 years is given in Table 11. During this period these same 10 species have been the most abundant and bluegills and yellow perch combined have regularly made up at least 60 per cent of the total catch. The order of abundance of the 10 species in the total non-trout catch is the same as in 1943 with the exception of yellow pikeperch and rock bass, whose positions in the order were reversed in 1943.

Other Fish Taken from

Non-Trout Waters

A total of 7,093 fish referable to 19 different kinds of fish, not listed in Table 11, made up 6.1 per cent of the total catch from non-trout waters. These fish listed in their order of abundance follow:

Bullheads	2,828	Brown trout	50
Suckers	1,863	Redhorse	43
Carp	906	Lake trout	42
Herring	721	Sheepshead	27
Catfish	161	Garpike	18
Dogfish	128	Muskellunge	14
Brook trout	92	Warmouth bass	12
Rainbow trout	92	Chubs	5
White bass	84	Whitefish	4
		Mud pickerel	3

Composition of Catch--

Non-Trout Waters, by

Hatchery Districts

The 10 species of fish most frequently recorded in the non-trout catch and their relative abundance in the total catch for each hatchery district are given in Table 12. In each district these fish made up at least 90 per cent of the total catch for the district with the exception of District 5, in which they constituted 87.9 per cent. Furthermore, they made up more than 95 per cent of the catch in 7 of the districts.

As in the reports of the general creel census for the past 5 years, the composition of the total non-trout catch has been determined by regions. These regions are the natural divisions of the state: Region I - the Upper Peninsula; Region II - the Lower Peninsula north of the Bay City-Muskegon line; and Region III - the Lower Peninsula south of the Bay City-Muskegon line. Two methods of comparing the catch in these three regions have been used: (1) the percentage of the total state catch of each species taken in each region (Table 13), and (2) the percentage of each species in the total catch for each individual region (Table 14). The fish mentioned in these two tables are arranged in order of decreasing abundance in the total state catch from non-trout waters.

The bluegill is taken in greater numbers in Region III than in the other two regions combined. This is to be attributed to the great amount of fishing done in the "bluegill" lakes located in the southern part of

Table 12

Percentage catch of the most important species from non-trout
waters, by hatchery districts, 1944

Kind of fish	1	2	3	4	5	6	7	8	9	10	11
Bluegill	13.16	12.08	6.14	13.26	28.62	5.73	58.42	56.67	76.57	63.68	48.89
Yellow perch	12.86	36.64	42.95	45.91	16.65	51.81	16.23	19.54	5.21	9.78	22.42
Black crappie	7.67	1.06	5.36	2.39	4.91	0.24	2.85	10.95	5.92	6.21	6.28
Pumpkinseed	1.32	5.66	3.69	2.56	12.24	1.60	8.45	2.31	2.99	6.38	4.22
Northern pike	14.22	18.70	5.16	4.38	11.13	11.94	2.45	2.36	0.53	1.01	1.60
Yellow pikeperch	34.21	7.84	3.49	5.45	6.27	1.81	1.37	0.80	0.97	0.32	0.20
Rock bass	0.82	4.44	6.63	10.62	5.05	2.41	2.42	1.10	0.47	3.52	4.29
Largemouth bass	7.96	4.85	1.66	1.07	1.62	0.59	4.01	2.04	2.72	2.07	2.43
Smelt	0.02	0.04	18.15	...	0.07	19.16	0.11	...	...	...	...
Smallmouth bass	5.55	7.74	3.45	4.41	1.29	2.79	2.64	0.50	0.39	0.55	0.76
Total	97.79	99.05	96.68	90.05	87.85	98.53	98.95	96.27	95.77	93.52	91.09

Table 13

Percentage of the total state catch of each of 10 species taken in each geographical region of Michigan--all non-trout waters, 1944

Kind of fish	REGION I		REGION II		REGION III	
	Upper Peninsula		Northern half of Lower Peninsula		Southern half of Lower Peninsula	
	Number	Percentage	Number	Percentage	Number	Percentage
Bluegill	1,379	2.67	9,030	17.47	41,266	79.86
Yellow perch	2,725	11.05	11,681	47.35	10,264	41.60
Black crappie	472	6.97	1,408	20.81	4,888	72.22
Pumpkinseed	385	6.83	2,596	46.08	2,653	47.09
Northern pike	1,773	33.01	2,660	49.53	938	17.46
Yellow pikeperch	2,278	54.71	1,594	38.28	292	7.01
Rock bass	290	6.99	2,166	52.18	1,695	40.83
Largemouth bass	698	23.22	698	23.22	1,610	53.56
Smelt	3	0.14	2,148	99.86	...	...
Smallmouth bass	728	33.88	1,033	48.07	388	18.05
Total or percentage	10,731	9.78	35,014	31.91	63,994	58.31

the state. Yellow perch were taken in greatest numbers in Region II and in next greatest numbers in Region III. Nearly nine-tenths (89.0 per cent) of all perch recorded in the general census were taken in the Lower Peninsula. The black crappie was caught more frequently in Region III than in the other 2 regions combined, whereas the distribution of the pumpkinseed in the total catch closely followed that of the perch in being taken largely in the Lower Peninsula (93.2 per cent). More northern pike were taken in Region II than in any other region, although one-third of the state catch of these fish was reported from the Upper Peninsula (Region I). Most yellow pikeperch were caught in Region I, whence 54.7 per cent of the records of such fish were submitted. The distribution of rock bass in the catch also simulated that of the perch. Largemouth bass, caught in equal numbers in Regions I and II, were most frequently taken in Region III, whereas the smallmouth bass was taken most frequently in Regions II and I and least frequently in Region III. Nearly all of the smelt recorded in the census were reported from Region II.

Bluegills were taken in greater numbers than any other species in Region III, whereas yellow perch dominated the catch in the other 2 regions. For the entire state these 2 species made up 65.3 per cent of the total catch. In Region I the yellow pikeperch ranked second and was followed in order by northern pike, bluegills, smallmouth bass, largemouth bass, crappies, pumpkinseeds, rock bass, and smelt. The bluegill ranked second to the perch in Region II and was followed in order by northern pike, pumpkinseeds, rock bass, smelt, yellow pikeperch, crappie, smallmouth bass and largemouth bass. Yellow perch ranked second to the bluegill in Region III

Table 14

Percentage composition of anglers' catch by species reported in each geographical region of Michigan--all non-trout waters, 1944

Kind of fish	REGION I		REGION II		REGION III	
	Upper Peninsula		Northern half of Lower Peninsula		Southern half of Lower Peninsula	
	Number	Percentage	Number	Percentage	Number	Percentage
Bluegill	1,379	12.61	9,030	24.01	41,266	60.43
Yellow perch	2,725	24.92	11,681	31.05	10,264	15.03
Black crappie	472	4.32	1,408	3.74	4,888	7.16
Pumpkinseed	385	3.52	2,596	6.90	2,653	3.89
Northern pike	1,773	16.22	2,660	7.07	938	1.37
Yellow pikeperch	2,278	20.83	1,594	4.24	292	0.43
Rock bass	290	2.65	2,166	5.76	1,695	2.48
Largemouth bass	698	6.38	698	1.86	1,610	2.36
Smelt	3	0.03	2,148	5.71	...	...
Smallmouth bass	728	6.66	1,033	2.75	388	0.57
Total	10,731	98.14	35,014	93.09	63,994	93.72

and was followed in order by crappies, pumpkinseeds, rock bass, largemouth bass, northern pike, smallmouth bass, and yellow pikeperch. No smelt were recorded from Region III.

Composition of Catch--

Great Lakes Waters

Yellow perch made up the majority of the catch (72.2 per cent) of the catch from Great Lakes waters (Table 15). It was followed in order by yellow pikeperch, rock bass, smallmouth bass, crappies, bullheads, northern pike, and lake trout.

Table 15

Percentage composition of the total catch for
Great Lakes waters (only the eight most abundant
species are considered)

Kind of fish	1942	1943	1944
Yellow perch	84.23	76.67	72.16
Yellow pikeperch	1.68	6.53	6.50
Rock bass	3.80	2.95	3.82
Smallmouth bass	2.10	6.29	3.81
Crappies	0.64	0.31	3.07
Bullheads	2.66	1.69	2.43
Northern pike	1.17	1.74	2.12
Lake trout	1.66	0.17	0.20
Total	97.94	96.35	94.11

Residence of Anglers

Of the 46,100 anglers recorded in the general creel census for 1944, there were 40,874 (88.7 per cent) who lived in Michigan and the remaining 5,226 (11.3 per cent) lived outside the state (Table 16). This is very

Table 16

Number of fishermen, resident and non-resident, and percentage of non-resident fishermen in each hatchery district, all waters, 1944

District	Total number of fishermen	Resident fishermen	Non-resident fishermen	Percentage non-residents
1	4,418	3,779	639	14.46
2	4,959	4,537	422	8.51
3	3,060	2,491	569	18.59
4	2,671	2,290	381	14.26
5	7,450	6,831	619	8.31
6	1,449	1,368	81	5.59
7	2,018	1,847	171	8.47
8	3,489	3,424	65	1.86
9	3,701	2,167	1,534	41.45
10	3,105	2,941	164	5.28
11	9,780	9,199	581	5.94
Total or percentage	46,100	40,874	5,226	11.34

nearly the same percentage as in 1943. The greatest number of non-resident anglers were interviewed by the officers in District 9 (1,534 non-residents). In that district 41.5 per cent of all anglers interviewed were from outside the state. The officers in District 8 interviewed the smallest number (65) of non-residents and these anglers made up only 1.9 per cent of all anglers in the district.

Catch per Hour--Resident
and Non-resident Anglers

As in other years, resident anglers were usually more successful than were the non-residents (Table 17). In only 1 district (District 5) was the catch per hour of non-resident anglers higher than that of the resident anglers. The average catch per hour for all residents (1.18 fish) was 0.12 fish per hour greater than that for all non-residents (1.06 fish). However, only 29.7 per cent of all non-resident anglers were unsuccessful, whereas 31.0 per cent of all resident anglers caught no fish.

Table 17

Number of resident and non-resident anglers, and the number of unsuccessful fishermen and the catch per hour for each group, all waters, by hatchery districts, 1944

District	RESIDENT ANGLERS			NON-RESIDENT ANGLERS		
	Total number	Number unsuccessful	Catch per hour	Total number	Number unsuccessful	Catch per hour
1	3,779	1,356	0.62	639	123	0.61
2	4,537	1,270	0.92	422	111	0.71
3	2,491	877	1.46	569	237	0.93
4	2,290	678	1.29	381	86	1.08
5	6,831	3,190	0.61	619	283	0.90
6	1,368	461	1.20	81	41	0.43
7	1,847	462	1.29	171	46	1.27
8	3,424	842	1.36	65	9	0.96
9	2,167	399	1.86	1,534	360	1.45
10	2,941	869	1.48	164	97	0.52
11	9,199	2,254	1.56	581	161	1.54
Total or average	40,874	12,658	1.18	5,226	1,554	1.06

The number of resident and non-resident anglers, the number of hours spent fishing by each group and the number of fish each group caught are given in Table 18. These data furnish the information that the 11.3 per cent of all anglers who were non-residents fished 11.0 per cent of the

Table 18

Number of resident and non-resident anglers, the number of hours spent fishing and the number of legal-sized fish taken by each group--all waters, by hatchery districts, 1944

District	Number of anglers		Total hours fished		Total legal fish taken	
	Resident	Non-resident	Resident	Non-resident	Resident	Non-resident
1	3,779	639	15,477.7	2,880.7	9,592	1,760
2	4,537	422	17,135.9	1,597.7	15,703	1,128
3	2,491	569	7,436.8	1,353.4	10,837	1,265
4	2,290	381	6,313.0	1,152.6	8,119	1,249
5	6,831	619	20,694.2	1,832.7	12,636	1,652
6	1,368	81	4,021.0	363.2	4,834	155
7	1,847	171	5,972.7	548.5	7,686	696
8	3,424	65	10,767.7	223.5	14,690	214
9	2,167	1,534	6,217.4	4,570.1	11,557	6,620
10	2,941	164	8,205.8	390.2	12,185	203
11	9,199	581	33,208.8	1,832.9	51,660	2,821
Total	40,874	5,226	135,451.0	16,745.5	159,499	17,763

total hours fished and caught 10.0 per cent of the legal fish recorded in the 1944 census.

Residence of Resident Anglers

Residents of Wayne County made up 41.8 per cent of all anglers interviewed by the officers during 1944. They were followed in order by residents of Ingham County (5.1 per cent), Kent County (4.6 per cent), Genesee County (4.4 per cent), Gogebic County (3.4 per cent), Iron County (2.9 per cent), and Saginaw County (2.5 per cent). Residents of these 8 counties made up 41.8 per cent of all resident anglers interviewed during 1944.

Ohioans made up 44.2 per cent of all non-resident anglers and were followed in order by Indiana (28.9 per cent), Illinois (18.4 per cent), and Wisconsin (6.8 per cent). These four states which border Michigan furnished 98.3 per cent of all non-resident anglers.

The residence of resident anglers by counties of residence and state of residence for non-resident anglers is given in Table 19.

Male and Female Anglers

During 1944 there were 6,957 women (15.1 per cent of all anglers) interviewed in the general census, a drop of 1.2 per cent from that of 1943. Male anglers enjoyed better fishing in all hatchery districts than did the women (Table 20). Although the women made up 15.1 per cent of all anglers, they fished only 14.4 per cent of the total hours fished and caught only 12.6 per cent of the total fish. Among the male anglers 29.4 per cent were unsuccessful whereas among the female anglers 37.5 per cent

Table 20

General creel census data for male and female anglers
for all waters, by hatchery districts, 1944

District	Number of anglers		Total hours fished		Total legal fish taken		Catch per hour	
	Male	Female	Male	Female	Male	Female	Male	Female
1	4,075	343	17,012.5	1,345.9	10,713	639	0.63	0.47
2	4,448	511	16,852.8	1,880.8	15,211	1,620	0.90	0.86
3	2,595	465	7,628.3	1,161.9	10,994	1,108	1.44	0.95
4	2,344	327	6,674.7	790.9	8,698	670	1.30	0.85
5	5,931	1,519	18,148.6	4,378.3	11,601	2,687	0.64	0.61
6	1,254	195	3,814.0	570.2	4,472	517	1.17	0.91
7	1,730	288	5,536.2	985.0	7,249	1,133	1.31	1.15
8	2,978	511	9,441.7	1,549.5	13,117	1,787	1.39	1.15
9	3,080	621	8,999.8	1,787.7	15,846	2,331	1.76	1.30
10	2,609	496	7,473.7	1,122.3	11,268	1,120	1.51	1.00
11	8,099	1,681	28,764.0	6,277.7	45,821	8,660	1.59	1.38
Total or average	39,143	6,957	130,346.3	21,850.2	154,990	22,272	1.19	1.02

Table 19

Residence of fishermen

Resident anglers		Non-resident anglers			
County	Number	County	Number	State or Province	Number
Alcona	41	Mackinac	274	California	7
Alger	253	Macomb	355	Florida	1
Allegan	312	Manistee	577	Illinois	960
Alpena	306	Marquette	884	Indiana	1,512
Antrim	360	Mason	214	Iowa	2
Arenac	44	Mecosta	138	Kentucky	16
Baraga	126	Menominee	344	Maryland	2
Barry	323	Midland	523	Minnesota	1
Bay	401	Missaukee	125	Missouri	8
Benzie	78	Monroe	237	Montana	1
Berrien	238	Montcalm	467	Nevada	13
Branch	306	Montmorency	372	North Dakota	9
Calhoun	320	Muskegon	320	Ohio	2,308
Cass	166	Newaygo	183	Pennsylvania	11
Charlevoix	352	Oakland	753	Tennessee	7
Cheboygan	230	Oceana	165	Texas	2
Chippewa	276	Ogemaw	109	Washington	9
Clare	254	Ontonagon	378	Wisconsin	355
Clinton	318	Osceola	99		
Crawford	94	Oscoda	231	Washington, D. C.	2
Delta	432	Otsego	180		
Dickinson	928	Ottawa	375	Total	5,226
Eaton	299	Presque Isle	98		
Emmet	374	Roscommon	660		
Genesee	1,804	Saginaw	1,003		
Gladwin	279	St. Clair	619		
Gogebic	1,373	St. Joseph	170		
Grand Traverse	299	Sanilac	98		
Gratiot	444	Schoolcraft	309		
Hillsdale	199	Shiawassee	305		
Houghton	408	Tuscola	94		
Huron	470	Van Buren	177		
Ingham	2,071	Washtenaw	677		
Ionia	426	Wayne	6,067		
Iosco	163	Wexford	561		
Iron	1,197				
Isabella	230	Unknown	353		
Jackson	1,685				
Kalamazoo	579	Total	40,874		
Kalkaska	18				
Kent	1,890				
Keweenaw	152				
Lake	84				
Lapeer	571				
Leelanau	183				
Lenawee	592				
Livingston	233				
Luce	199				

caught no fish. The average catch per hour for men was 1.19 fish, whereas that for the women was 1.02 fish.

Comparison of General Creel Census Data

With That of Other Years

A summary of the general creel census data for the past 5 years is given in Table 21. There had been a decrease in the catch per hour for all waters from 1938 through 1940, and from 1941 to 1943 there was a slight but steady increase. The catch per hour for 1943 and 1944 was identical (1.16 fish per hour). There has been little variation in the catch per hour from trout waters and only a slight increase in that for non-trout waters. The catch per hour for Great Lakes waters has remained consistently higher than that for trout and non-trout waters for the three years these waters have been considered separately.

The relative numbers of non-resident anglers dropped considerably following 1942 but remained the same in 1943 and 1944. The relative number of female anglers has declined since 1942 perhaps because of the entrance of women into war work.

The apparent cycle in the quality of fishing over the entire state is indicated by the data in Table 22. However, the increase in the quality of fishing following the low point of 1940 and 1941 has failed to develop to the heights attained in 1934 and 1935.

The data do show that the quality of fishing is best in the Great Lakes waters where anglers have averaged 1.69 fish per hour for three successive years as compared with an average of 1.14 fish per hour in non-trout waters over the same three-year period.

Table 21

Comparison of data from the general creel census
for the past five years

	1940	1941	1942	1943	1944	Simple average
CATCH PER HOUR:						
All waters	1.0	1.0	1.1	1.2	1.2	1.1
Resident	1.0	1.0	1.2	1.2	1.2	1.1
Non-resident	0.9	0.9	0.8	1.1	1.1	1.0
Male	1.0	1.0	1.2	1.2	1.2	1.1
Female	0.8	0.8	1.1	1.0	1.0	0.9
Trout waters	0.8	0.8	0.9	0.9	0.8	0.8
Resident	0.8	0.8	0.9	1.0	0.8	0.9
Non-resident	0.5	0.6	0.7	0.7	0.7	0.6
Male	0.8	0.8	0.9	0.9	0.8	0.8
Female	0.3	0.5	0.6	0.7	0.4	0.5
Non-trout waters	1.0	1.0	1.1	1.2	1.2	1.1
Resident	1.1	1.1	1.2	1.2	1.1	1.1
Non-resident	0.9	0.9	0.9	1.0	1.0	0.9
Male	1.1	1.1	1.1	1.2	1.2	1.1
Female	0.8	0.9	1.0	1.0	0.9	0.9
Great Lakes waters			1.7	1.6	1.8	1.7
Resident			2.0	1.5	1.8	1.8
Non-resident			0.9	1.8	2.1	1.6
Male			1.8	1.6	1.9	1.8
Female			1.2	1.3	1.6	1.4
PERCENTAGE OF ALL ANGLERS REPRESENTED BY:						
Non-residents	15.1	14.8	15.7	11.2	11.3	13.6
Female anglers	13.9	16.2	17.1	16.3	15.1	15.7
PERCENTAGE OF TROUT ANGLERS REPRESENTED BY:						
Non-residents	6.9	9.5	11.0	4.0	4.5	7.2
Female anglers	5.8	6.9	10.2	7.6	7.1	7.5
PERCENTAGE OF NON-TROUT ANGLERS REPRESENTED BY:						
Non-residents	16.7	16.1	17.3	12.5	13.8	15.3
Female anglers	15.7	18.4	19.1	17.8	16.3	17.5
PERCENTAGE OF GREAT LAKES ANGLERS REPRESENTED BY:						
Non-residents			9.7	13.3	4.9	9.3
Female anglers			11.6	13.1	19.3	14.7
PERCENTAGE OF ANGLERS TAKING NO FISH:						
All waters	35.7	33.1	31.0	28.8	30.6	31.8
Trout waters	34.8	33.8	29.5	29.4	35.6	32.6
Non-trout waters	36.1	33.0	32.1	25.5	25.7	30.5
Great Lakes waters			20.0	11.9	12.2	14.7

Table 22

Catch per hour for all waters, trout waters, non-trout waters, and Great Lakes waters as indicated by the general creel census since 1928

Year	All waters	Trout waters	Non-trout waters	Great Lakes waters
1928	1.09	1.17	1.05	...
1929	0.96	1.17	0.88	...
1930	0.88	0.93	0.85	...
1931	0.91	0.97	0.88	...
1932	1.26	1.10	1.32	...
1933	0.97	0.68	1.28	...
1934	1.73	0.79	1.80	...
1935	1.58	0.80	1.85	...
1936	1.40	0.79	1.66	...
1937	1.46	0.76	1.68	...
1938	1.29	0.91	1.41	...
1939	1.06	0.83	1.12	...
1940	0.99	0.78	1.04	...
1941	1.00	0.77	1.06	...
1942	1.14	0.89	1.11	1.67
1943	1.16	0.90	1.17	1.60
1944	1.16	0.79	1.13	1.81
Simple average	1.18	0.88	1.25	1.69

The appendix to this report in the form of detailed tables has been omitted as in 1941-43. These detailed tables for the data herein presented are on file at the office of the Institute for Fisheries Research, University Museums Annex, Ann Arbor.

INSTITUTE FOR FISHERIES RESEARCH

Louis A. Krumholz
Junior Aquatic Biologist

Report approved by A. S. Hazzard

Report typed by V. M. Andres