Original: Fish Division
cc: Education-Game
Mr. Clark

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
ANN ARBOR, MICHIGAN

October 18, 1940

REPORT NO. 625

REPORT OF THE GENERAL CREEL CENSUS FOR 1939

by

O. H. Clark

This report is for the twelfth year that the general census has been conducted in Michigan. The records obtained from this census represent catches from all sections of the state, with a few records from the Great Lakes and their connecting waters. Over this period the Conservation Officers during every month of each year have contacted fishermen and reported their catches on blanks provided for that purpose by the Fish Division of the Michigan Conservation Department. The general census is a random sampling covering most of the important waters of the state, representing all types of inland lake and stream fishing, and the approximately 183,000 records submitted over the past twelve-year period furnish an index to the quality of fishing available in the state.

This report will follow closely the corresponding reports for other years, in order that comparisons may be made the more readily. Methods used in analyses and compilations are the same as in previous reports. No records from the intensive censuses conducted by the Institute for Fisheries Research and by the CCC are included in this report except where

comparisons are drawn. All data submitted were taken by the Conservation Officers in connection with their regular patrol duties. The records taken by the officers include only the day's fishing to the time of the interview, not the full day's fishing as recorded in the intensive censuses. Only legal-sized fish are considered in the subsequent figures.

Classifying of lakes into trout and non-trout waters is not expecially difficult as a rule, but the matter becomes decidedly complicated in streams which are trout waters in some localities and non-trout waters in others. Such streams are classified as one or the other in any one county, but may be regarded the opposite in another county. Some discrepancy undoubtedly arises from this method, but in general the error probably is not great. Over most of the state, trout records were obtained from stream anglers and non-trout records from the lake fishermen. For this reason this report for convenience has designated the stream records as trout records and lake records as non-trout records.

In 1939 a total of 32,432 records were secured and forwarded to the Institute for Fisheries Research of the Michigan Conservation Department, where they were analysed and tabulated.

The 32,432 fishermen fished 109,031.75 hours and caught 115,449 legal-sized fish at the rate of 1.1 fish per hour. This rate of catch per hour is 0.2 of a point lower than in 1938 and 0.4 of a point lower than in 1937. The average catch per hour for all waters was 1.1 per hour. The rate of catch per hour for trout waters was 0.8 for 1939, which is 0.1 of a fish per hour less than in 1938, and equal to the 1937 catch per hour. The catch per hour for non-trout waters was 1.1 for 1939, indicating 0.3 of a fish per hour less than in 1938, and 0.6 of a fish per hour less than in 1937, and a

reduction of 0.8 of a fish per hour over the high point for 1935 when the catch per hour was 1.9.

The average size for all fish taken was 8.7 inches, 0.2 of an inch longer than in 1938, and 0.1 of an inch less than in 1937.

16%* of all fishermen were non-residents, based on the 1939 records, 1.8% above the 1938 figure.

Women anglers represented 11.6% of all fishermen in 1939, as compared with 6% in 1938, and 7½% in 1937. They caught fish at the rate of 0.9 fish per hour, whereas the male angler averaged 1.1 fish per hour. Women preferred lake fishing to stream fishing by the ratio of 13 to 4, compared with 7 to 3 in 1938.

DETAILED ANALYSIS

Number of Records

Reports were submitted for 32,432 fisherman-days, which represents an increase of 7,923 in 1939 over 1938.

In all, 109,031.75 hours of fishing were recorded, an increase of 27,466.50 over 1938, and an increase of 47,389.75 over 1937.

The Conservation Officers are to be commended for this substantial increase in the number of their records. There are some counties still submitting too few records as is shown in Table 10 and the map in the appendix. We hope that no county will submit less than 400 records this coming year. If this goal can be reached it will mean that a more proper evaluation of the fishing in each county may be attained. To date this has not been possible

---

*Weighted average.

due to the lack of records from some counties, as Table 5 in the appendix shows. No records at all were obtained from Bay and Isabella counties, and less than 100 records each from Arenac, Ingham, Iosco, Keweenaw, Mecosta, Muskegon, Ogemaw, Saginaw, St. Joseph, Sanilac, Shiawassee, and Tuscola counties. Considerable variation is to be expected, since certain counties have a large number of productive lakes and streams which are heavily fished, while others afford very little inland fishing, but it is felt that the aim of not less than 400 records from each county is not too high for each of the Conservation Officers to strive for. These records, as far as it is practical, should be spread throughout the fishing year in order that a better cross section of all fishing may be attained. A large number gathered on one particular day would bias the results from that area and would not constitute a proper random sample. A suggestion is made that a few records be taken each week, pro-rated as far as possible according to the fishing pressure for that time of year.

The number of fishermen, hours fished, and number of legal-sized fish caught for each hatchery district are shown in Table I.

TABLE I

Number of fishermen, hours fished and number of legal-sized fish caught, for each hatchery district

District	Number of fishermen	Hours fished	Number of legal-sized fish caught
1	2,496	9,450.25	5,502
2	3,043	10,803.00	11,940
3	1,717	5,405.50	6,700
4	5,610	15,434.50	17,393
5	6,971	22,322.50	20,995
6	757	2,720.25	2,676
7	2,086	6,705.25	8,688
8	1,759	5,586.75	7,617
9	2,331	8,591.00	11,242
10	1,443	4,216.00	6,414
11	4,219	17,796.75	16,282
Total	32,432	109,031.75	115,449

16% of all anglers were non-residents. This is 1.8% less than in 1938. The total number of non-residents was 5,097. 18% of the non-trout fishermen were non-resident, and 7% of the trout fishermen were non-resident. The greatest percentage of non-resident fishermen preferred district number 9, which includes Allegan, Van Buren, Kalamazoo, Berrien, Cass, St. Joseph, Branch, and Hillsdale counties. Table II shows the percentage of fishing by non-residents for hatchery districts.

TABLE II

The percentage of fishing by non-residents

District		Percentage of all fishermen
1		13
2		15
3		24
4		26
5		16
6		15
7		10
8		2
9		29
10		7
11		5
Average	weighted ave.	16
	simple ave.	14.7

Per Cent of Returns for Trout and Non-Trout Waters by Hatchery Districts

Table III gives the percentage of returns for trout and non-trout waters.

TABLE III

Per cent of returns for trout and non-trout waters

District	No. of records for trout waters	Percentage of returns	No. of records for non-trout waters	Percentage of returns
1	1,133	45.4	1,363	54.6
2	1,202	39.5	1,841	60.5
3	435	25.3	1,282	74.7
4	846	15.1	4,764	84.9
5	840	12.0	6,131	88.0
6	187	24.7	570	75.3
7	607	29.1	1,479	70.9
8	56	3.2	1,703	96.8
9	207	8.9	2,124	91.1
10	11	0.8	1,432	99.2
11	4	0.1	4,215	99.9
Total	5,528	17.0	26,904	83.0

The greatest percentage of trout records as compared with non-trout records came from hatchery district number 1, which was 45.4% based on 1,133 records. In 1938 district number 3 ranked first. In 1939 district number 2 ranked second with 39.5% based on 1,202 records. District number 3 ranked third with 25.3% based on 435 records. The 7 hatchery districts showing the greatest percentage of trout records all lie north of the Bay City - Muskegon line. The greatest percentage of non-trout fishing occurred in hatchery district number 11 where 99.9% of the fishing was for species other than trout, followed by district number 10 with 99.2%, and district

number 8 with 96.8%. Table III gives the percentage of returns for trout and non-trout waters.

Quality of Fishing

As in previous years the quality of fishing as indicated in the catch per hour is highest in those hatchery districts located in the southern portion of the state. The lowest catch per hour is found in the first five hatchery districts. The highest was in districts 9 and 11, the same as in 1938. Table IV shows the catch per hour for all waters by hatchery districts. The data indicates that considerable variation has occurred over the four year period in the different hatchery districts; this may have been caused partly by cyclic fluctuations in the fish populations of certain lakes from which the records were taken. The greatest change occurred in district 11 where in 1936 the catch per hour was 2.4 and in 1939 was 0.9, a difference of 1.5.

TABLE IV

Catch per hour - All waters, by hatchery districts

District	1939	1938	1937	1936
1	0.6	0.6	0.8	1.0
2	1.1	1.1	1.1	1.1
3	1.2	1.0	0.8	1.0
4	1.1	1.5	1.4	1.2
5	0.9	1.1	1.4	1.0
6	1.0	1.1	0.9	1.3
7	1.3	1.5	1.4	1.4
8	1.4	1.4	1.9	1.7
9	1.3	2.0	2.7	2.4
10	1.5	1.8	1.9	1.3
11	0.9	1.6	2.1	2.4
Average for state	1.1	1.3	1.5	1.4

The average catch per hour for all waters in 1939 was 1.1. In 1938 it was 1.3, and in 1937 it was 1.5, and 1.4 in 1936. The average catch per hour for the twelve year period is slightly over 1.2 fish per hour. The lowest recorded catch per hour occurred in 1930 when the record was 0.85 fish per hour. In 1929, '30, '31 the figure remained below 1 fish per hour. From 1932 to 1935 the catch per hour rose (with a slight reduction in 1933) to a high of 1.9 fish per hour, and since '35 there has occurred a progressive decline to the present figure. Chart A in Appendix 4 graphically shows this change in the catch per hour. Upon this same chart is drawn the annual sale of licenses since 1933, the first year that a general fishing license was sold. Over this period the licensees have increased progressively from 351,644 to 808,904 in 1939. A study of this chart suggests several possible reasons for the decrease in the catch per hour, the more obvious being the great increase in the number of licenses sold. Several factors argue against this solution of the problem; first, the tendency of the fish populations to maintain (within limits) a constant per acre poundage; in other words, as a quantity of fish are removed those remaining have additional food and space. This fact may result in an actual increase in numbers of fish per unit area of water surface, for by the removal of the larger fish, more smaller fish would survive. Another factor may well be the preponderance of unskilled anglers among the 457,000 new fishermen since 1933, as it has been shown in other reports that the expert has a decided edge over the tyro. Another possible reason for the decrease in the catch per hour suggested by the chart, is a cyclic condition and as indicated on the graph may cover approximately a ten-year period. Much more data are necessary over a

longer period of time before sound conclusions can be drawn regarding this phenomenon. It may be coincidence that the down cycle (1935 to 1939) parallels the heavy increase in the number of fishing licenses sold. This is partly substantiated by the fact that prior to 1933, presumably going back to the "good old days," the catch per hour was lower, according to the creel records, than for any subsequent period and general opinion is that the number of anglers was less than in recent years. It is not the author's intention to minimize the effect that the constantly increasing number of fishermen may have on the sport fisheries of the state. The reduced catches of whitefish and lake trout in the Great Lakes indicate that waters can be overfished. It may be that in the future our inland waters will show the effects of the rapidly growing number of anglers. In 1933 (the first year that a general license was sold) there were 351,644 licensees; in 1939, 808,904 were sold, an increase of 457,000 anglers. There is ample water area in Michigan to accommodate this number and probably more were they more evenly distributed. This distribution is not even, for many lakes are privately owned, public access to others is limited, and facilities, such as boat liveries, cottages and ease of access are not to be had on all waters in the same degree. This results in the favoring of those lakes with the most reliable facilities. Certain lakes gain a reputation for good or poor fishing, materially affecting the fishing pressure on them. Summing up the foregoing discussion, we find a complex problem with many remifications needing more data before any particular reason or combination of reasons can be advanced for the indicated reduction in the catch per hour.

It may be of interest here to give some figures relative to the size of our inland sport fisheries. Assuming that each licensee in 1939 went fishing for one day, and spent 3.4 hours on the water catching 1.1 fish per hour (these averages are from the 32,000 records submitted in 1939), he would have taken 3.74 fish or a total for the 800,000 anglers of 2,992,000 fish. These fish would have averaged 8.7 inches in length and would run about three to the pound. Totaling this we find 992,000 pounds or about 500 tons of fish would have been caught. This figure is probably conservative as no license is required for persons under 18 years of age and the wives of licensees, their number being unknown.

The data from the general census records is increasing in value as more and more material becomes available for analysis. Fishing trends over the longer periods are beginning to show. Twelve-year comparisons are now possible and soon we will be able to pin down the good old days with a record. Each succeeding year adds additional value and it is hoped that the uninterrupted sequence of records will continue. Reports for individual waters are placed on summary cards and the twelve-year accumulation for many waters is giving the Department accurate information as to the most important species caught in each stream or lake. Such summaries have been helpful in preparing survey reports on waters covered. Intensive netting or intensive censuses have invariably confirmed the evidence collected by Conservation Officers through the general census, further proving its value.

Catch per Hour - Non-Trout Waters - By Hatchery Districts

TABLE V

Catch per hour - Non-trout waters

by hatchery districts

District	1936	1937	1938	1939
1	0.9	0.6	0.4	0.4
2	1.1	1.2	1.2	1.1
3	1.1	1.3	1.4	1.4
4	1.5	1.6	1.7	1.2
5	1.2	1.6	1.1	1.0
6	1.3	1.0	1.0	1.0
7	2.2	1.7	2.0	1.4
8	1.8	1.9	1.5	1.4
9	2.5	2.7	2.1	1.4
10	1.3	1.9	1.8	1.5
11	2.4	2.1	1.6	0.9
Average	1.7	1.7	1.4	1.1

The accompanying table records the data on the catch per hour by hatchery districts for 1939, compared with the three previous years. This material is presented in the form of a graph in the appendix. Out of the eleven districts, all but number 3 indicate a reduction in the catch per hour in 1939.

Chart B in the appendix (4) indicates the catch per hour for non-trout waters by hatchery districts for 1939 compared with the averages for the three years, 1937, 1938, and 1939.

Catch per Hour Comparisons with Intensive Censuses

Comparing the catch per hour figures of the general census with those of the nine lakes* on which intensive censuses were run the summer of 1939,

*Bear Lake - Hillsdale County; Craig Lake - Branch County; Christiana Lake - Cass County; Paw Paw Lake - Berrien County; Stearns Bayou - Ottawa County; Hamlin Lake - Mason County; Clear and Big Portage Lakes - Jackson County; Sugar Loaf Lake - Washtenaw County.

we find a catch per hour of 1.1 for the general census and 1.0 for the intensive census. The figures from the intensive census range from a high of 1.9 fish per hour to a low of 0.6. These figures more closely approximate each other than they have in any past year. This suggests that the Conservation Officers are making a greater effort to record a random sample with a normal emphasis on the good catch. The catch per hour on trout waters in the comparison with the intensive census on trout waters presents a different picture, the figure being 0.8 from the general census and 0.46 for the intensive census. The discrepancy, though, is not as great as in 1938. This difference can be explained partly by a larger percentage of non-trout species entering the trout catch of the general census. This is no reflection upon the effort made by the Conservation Officers and emphasizes the difficulties of an arbitrary classification of these waters.

Comparing the average size of trout from the figures from the two types of censuses, we find that the average size of brook trout was 8.6 inches in the general and 7.9 inches in the intensive census; rainbow trout averaged 9.9 inches in the general and 8.4 inches in the intensive; brown trout were 10.6 inches in the general and 9.9 inches in the intensive census. These calculations were based on the following numbers of fish:

Species	General Census	Intensive Census
Brook trout	11,853	7,708
Rainbow trout	2,583	5,553
Brown trout	2,022	745

No comparisons with the intensive censuses on average size of fish from non-trout waters for 1939 are of value because the lakes on which the intensive censuses were run were all located in the southern portion of the state.

Catch per Hour for Trout Waters

TABLE VI

Catch per hour - Trout waters

by hatchery districts

District	1936	1937	1938	1939
1	1.2	1.1	0.9	0.8
2	1.2	0.9	1.1	1.2
3	0.8	0.7	0.8	1.0
4	0.7	0.7	0.8	0.7
5	0.6	0.4	0.6	0.5
6	1.3	0.7	1.2	1.0
7	0.6	0.8	0.9	1.0
8	0.2	0.4	0.4	0.2
9	0.3	0.5	0.8	0.6
10	1.9	0.8	1.8	1.1
11	1.5	---	---	0.1
Average	0.8	0.8	0.9	0.8

For the entire state on trout waters 5,528 fishermen fished 21,504 hours and caught 17,839 trout at the rate of 0.8 fish per hour. This closely approximates the figures for 1938. The total number of fish, 17,839, includes 1,381 fish of non-trout species taken in trout waters. Of the trout fishermen, 33% took no fish. The average fisherman fishing trout waters caught 3.2 fish while fishing 3.9 hours per day. His catch was identical with the 1938 figure, but he fished 0.4 of an hour longer to attain this catch. The counties showing the greatest catch per hour were Newaygo, with an average of 2.4 fish per hour based on 35 records, followed by Presque Isle with an average of 2.1 based on 73 records, and Houghton and Schoolcraft each with an average of 1.5 based on 121 and 104 records respectively.

Other Species in Trout Waters

TABLE VII

Other species in trout waters

Sucker	450
Small-mouth bass	159
Bullhead	161
Rock bass	149
Yellow perch	130
Northern pike	115
Walleye	63
Sunfish	45
Large-mouth bass	36
Bluegill	33
Crappie	19
Mullet	10
Warmouth	4
Pilot	3
Lake trout	2
Whitefish	2
Total	1,381

Chart C in the appendix shows the catch per hour for trout waters by hatchery districts compared with the average for 1937, 1938, and 1939.

Number and Size of Trout - Trout Waters

The distribution of species of trout in the catch, and the average length of the trout are shown by hatchery districts for trout waters in Table VIII.

TABLE VIII

Distribution of species of trout in the catch and average length of the trout, by hatchery districts, for trout waters

District	Brook trout		Rainbow trout		Brown trout	
	No.	Ave. size	No.	Ave. size	No.	Ave. size
1	2,354	8.8	338	10.0	337	10.2
2	4,854	9.0	187	11.8	42	11.7
3	1,124	8.3	138	9.3	78	10.8
4	1,081	8.1	951	10.0	133	11.5
5	938	8.2	187	10.3	532	10.8
6	376	8.5	24	12.0	6	14.0
7	839	8.1	625	9.1	790	10.4
8	22	8.2	1	8.0	13	9.1
9	205	9.2	131	10.0	88	11.1
10	59	8.4	1	8.0	3	9.0
11	1	14.0	0	---	0	---
Total or average	11,853	8.6	2,583	9.9	2,022	10.6

From the records it is apparent that the catch of trout in Michigan is still predominantly brook trout, followed by brown and rainbow. In 1937 the catch of brown trout exceeded that of rainbow. Of the 17,839 legal-sized fish reported from trout waters, 11,853, 72% of the total catch, were brook trout; 2,583, or 16% of the total catch, were rainbow; and 2,022, or 12% of the catch, were brown trout. The greatest percentage of brook trout in the total trout catch were taken in hatchery districts 2 with 95%, 6 with 93%, and 3 with 84%. (Hatchery districts 10 and 11 show a higher percentage, but insufficient records are available to warrant inclusion in this list.) The greatest percentage of rainbow trout was taken in hatchery districts 4 with 44%, district 9 with 31%, and district 7 with 28%. The greatest percentage of brown trout was taken in hatchery districts 8 with 36%, district 7 with 35%, and district 5 with 32%.

Brook trout averaged 8.6 inches in length. This is 0.1 of an inch less than in 1938. Rainbow averaged 9.9 inches in length, which is 0.13 of an inch less than in 1938. Brown trout averaged 10.6 inches in length, 0.2 of an inch longer than in 1938. The largest average brook trout came from hatchery districts 9, 2, 1 and 6. The largest rainbow came from hatchery districts 2, 5, 1, 4 and 9. The largest brown trout came from hatchery districts 2, 4 and 9. (Some districts are omitted from this listing because of insufficient records.) The data give more information regarding fish associated with trout or found in the non-trout portions of the streams. For the entire state the fish taken along with trout or from waters regarded as trout waters are given in Table VII, page 14. The figures are for the number of fish actually caught. The relative abundance of non-trout species present in trout waters is probably quite different from the relative abundance shown in this table. Suckers, for instance, would not be caught (or kept by many trout fishermen) as would the game fish, although studies of fish populations in trout streams have shown them to be present as commonest associates of trout.

The Catch by Species for Trout Waters by Hatchery Districts

TABLE IX

Percentage of species of the trout catch by hatchery districts

District	Total no. of trout	% Brook trout	% Rainbow trout	% Brown trout
1	3,029	78	11	11
2	5,083	95	4	1
3	1,340	84	10	6
4	2,165	50	44	6
5	1,657	57	11	32
6	406	93	6	1
7	2,254	37	28	35
8	36	61	3	36
9	424	48	31	21
10	63	94	1	5
11	1	100	—	—
Total or average	16,458	72	16	12

Composition of the Catch in Non-Trout Waters

Relatively slight change has occurred in the composition of the total catch in non-trout waters over the past five years. Bluegills continue to dominate from the non-trout waters, followed by yellow perch, rock bass, sunfish, bullheads, etc. The catch of bluegills was approximately 3.4% below the 1938 figure. To balance this, perch rose more than 4.5%. Black crappies dropped from 6.8% to 3.5%; rock bass from 7.2% to 4%; northern pike and walleyes changed little; largemouth bass fell from 3.5% to 2.2%, while smallmouth bass rose slightly from 1.9% to 2.4%. It is of interest here to point out the substantiating evidence that when one important species such as the bluegill falls in percentage value, other species tend to take up the slack. These figures are determined from the total catch according to the general census data for the entire state. In any particular lake or individual body of water considerable fluctuation in the composition of the catch may occur as has been shown before by the intensive census records.

Table X gives by hatchery districts the percentage composition of the catch for the important species (non-trout waters).

TABLE X

Percent of total catch per hatchery district

Species	1	2	3	4	5	6	7	8	9	10	11
Largemouth bass	4.4	1.7	1.4	1.5	0.3	1.2	3.5	1.8	4.9	2.7	3.1
Smallmouth bass	8.6	4.9	5.4	4.7	1.2	3.3	1.3	0.8	0.3	0.3	2.3
Bluegill	15.9	6.4	11.3	19.7	31.6	5.9	61.3	75.3	78.5	74.5	43.1
Sunfish	2.5	1.3	4.8	4.8	14.8	2.0	5.2	2.1	1.7	3.0	3.8
Yellow perch	19.7	55.7	45.8	25.9	12.6	37.2	21.3	9.6	6.9	6.6	29.9
Crappie	0.8	1.3	9.2	0.2	3.9	0.4	2.2	7.6	2.1	6.5	3.5
Rock bass	1.7	7.1	11.1	10.8	16.1	3.0	2.0	0.2	1.4	1.6	3.2
Walleye	16.0	7.2	1.5	3.0	3.5	2.1	0.7	0.1	0.1	0.3	2.5
Northern pike	15.6	11.7	3.8	1.3	3.7	18.7	2.2	0.8	0.5	0.1	1.0

Composition of the Catch by Hatchery Districts

The first four hatchery districts indicate the dominance of the smallmouth bass in the bass catch. In districts 5, 7, 8, 9, 10 and 11, bluegills predominate, rising to 78.5 per cent of the total catch in district number 9. In district 6 the bluegill catch was only 5.9 per cent, which accurately reflects the scarcity of lakes suitable for this species in the district. Yellow perch stand first in districts 1, 2, 3, 4 and 6. In district number 2, 55 per cent of the total catch from non-trout waters were yellow perch. The highest crappie catch was in district number 3. The greatest percentage of rock bass was taken from district 5. Sixteen per cent of the total catch in district number 1 was walleye pike and the percentage runs high in the next five districts, low in the next three and up in district 11, where the catch from Lake St. Clair, the St. Clair River and the Saginaw Bay area affects the catch advantageously. Similarly the northern pike catch is higher in the first seven districts and highest in district 6.

Table XI gives the percentage composition by species of the more important game fish caught in the non-trout waters for the entire state for a five-year period, together with comparative figures from the intensive censuses for 1939 alone.

TABLE XI

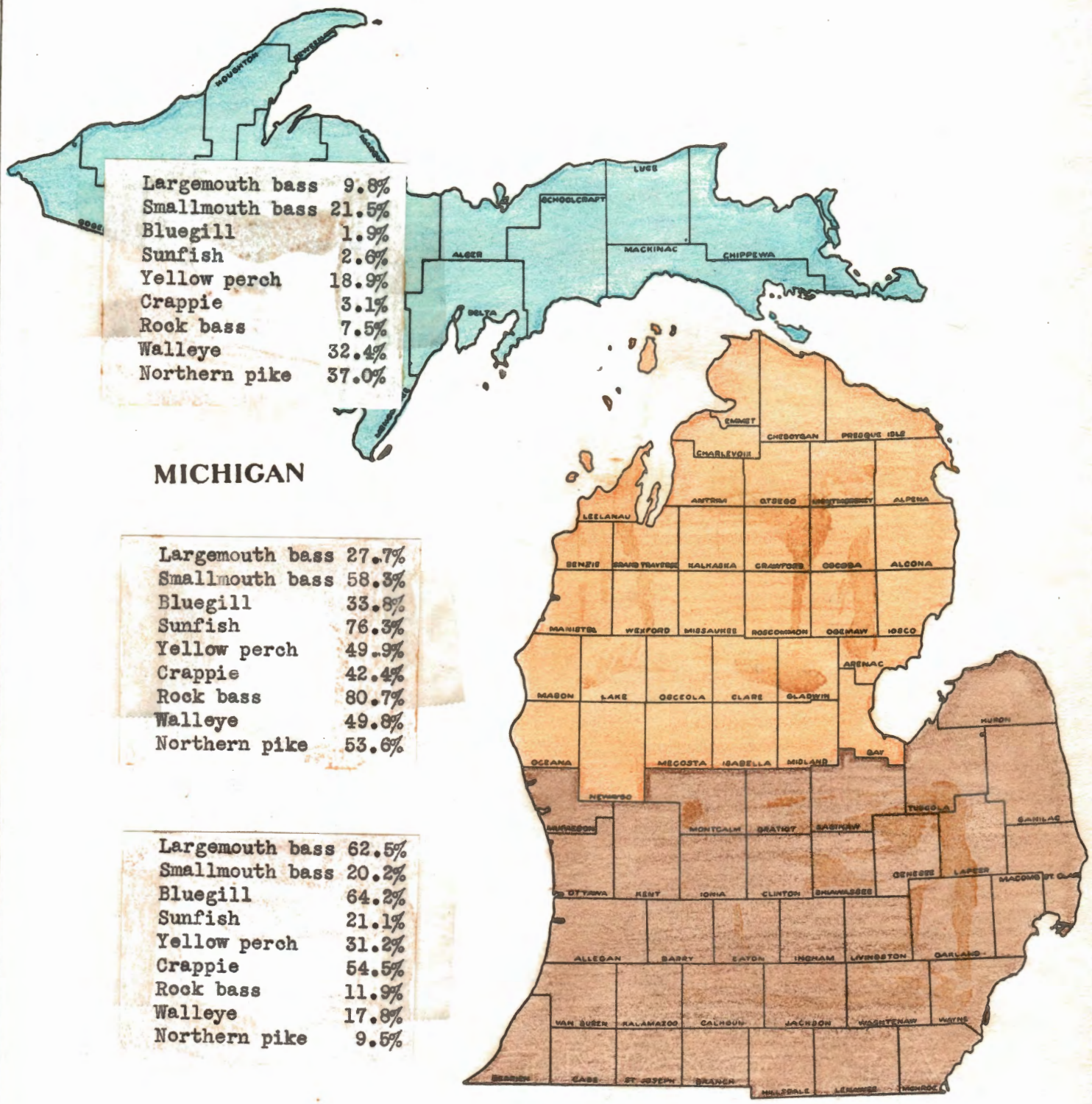
Percentage composition** by species - Non-trout waters

	General Census					Intensive Census*
Species	1935	1936	1937	1938	1939	1939
Largemouth bass	3.5%	3.7%	2.6%	2.6%	2.2%	3.9%
Smallmouth bass	1.9	2.8	2.0	2.3	2.4	Trace
Bluegills	42.7	44.8	44.5	44.7	4113	69.0
Sunfish	4.5	4.7	6.0	5.6	5.6	3.2
Yellow perch	18.2	21.5	22.1	17.4	22.2	9.4
Crappie	6.8	5.3	5.8	3.0	3.4	6.4
Rock bass	7.1	4.0	5.8	5.9	6.9	1.5
Walleye	2.2	2.0	2.0	2.6	2.6	None
Northern pike	2.8	2.8	2.7	3.2	3.1	0.52
Bullhead	1.7	3.3	1.0	2.2	4.2	3.0

**Weighted averages.

*Census figures from -- Bear Lake, Hillsdale Co.; Craig Lake, Branch Co.; Christiana Lake, Cass Co.; Paw Paw Lake, Berrien Co.; Stearns Bayou, Ottawa Co.

The composition of the catch has been determined for the 1939 general census by geographical districts. These districts are the natural divisions of the state, the Upper Peninsula constituting the first district, the upper half of the Lower Peninsula north of a line drawn roughly from Saginaw Bay to Muskegon the second, and that portion of the state lying south of this line being the third district. Comparisons are drawn between these areas according to two methods; the first, the percentage of the total catch of each of nine species taken in each of their respective districts -- as for instance 62.5 per cent of all the largemouth bass caught in the entire state were taken in the lower half of the Lower Peninsula, but only 9.8 per cent were taken in the Upper Peninsula; 58 per cent of the smallmouth bass were taken in the upper half of the Lower Peninsula and 20 per cent in the lower half. Map number 1 gives the percentages for the nine species.



GA-125

Map 1. Percentage of total catch of each of nine species taken in different geographical districts, Michigan

The percentage composition of the angler's catch according to species in each of the geographical districts is shown on map number 2. Of all the fish taken in the lower half of the Lower Peninsula, 63.2 per cent were bluegills; 16.5 per cent yellow perch; the other seven species accounting for but a small percentage of the total. In the Upper Peninsula 8.8 per cent of the total catch for the district were bluegills, and 46.5 per cent yellow perch, 12.7 per cent northern pike, followed by 9.4 per cent walleyes, smallmouth bass, rock bass, etc. In the upper half of the Lower Peninsula, bluegills and yellow perch are much more evenly divided than in the other districts. In this area 29.5 per cent of the catch were bluegills, 22.6 per cent yellow perch. The largest percentage of rock bass came from this district, constituting 11.4 per cent of the total. Similarly the catch of sunfish is greater here with 8.7 per cent of the total. The change from north to south is easily apparent in studying the accompanying two maps which graphically indicate the reasons why the average size of fish in the angler's catch varies from south to north. For instance, the larger fish such as northern pike, walleye, and smallmouth bass constitute a much greater percentage of the total catch in the two northern areas. Table XII gives the percentage composition of the angler's catch according to species in each of the geographical districts of the state.

TABLE XII

Percentage composition of the angler's catch

according to species

in each of the geographical districts of Michigan

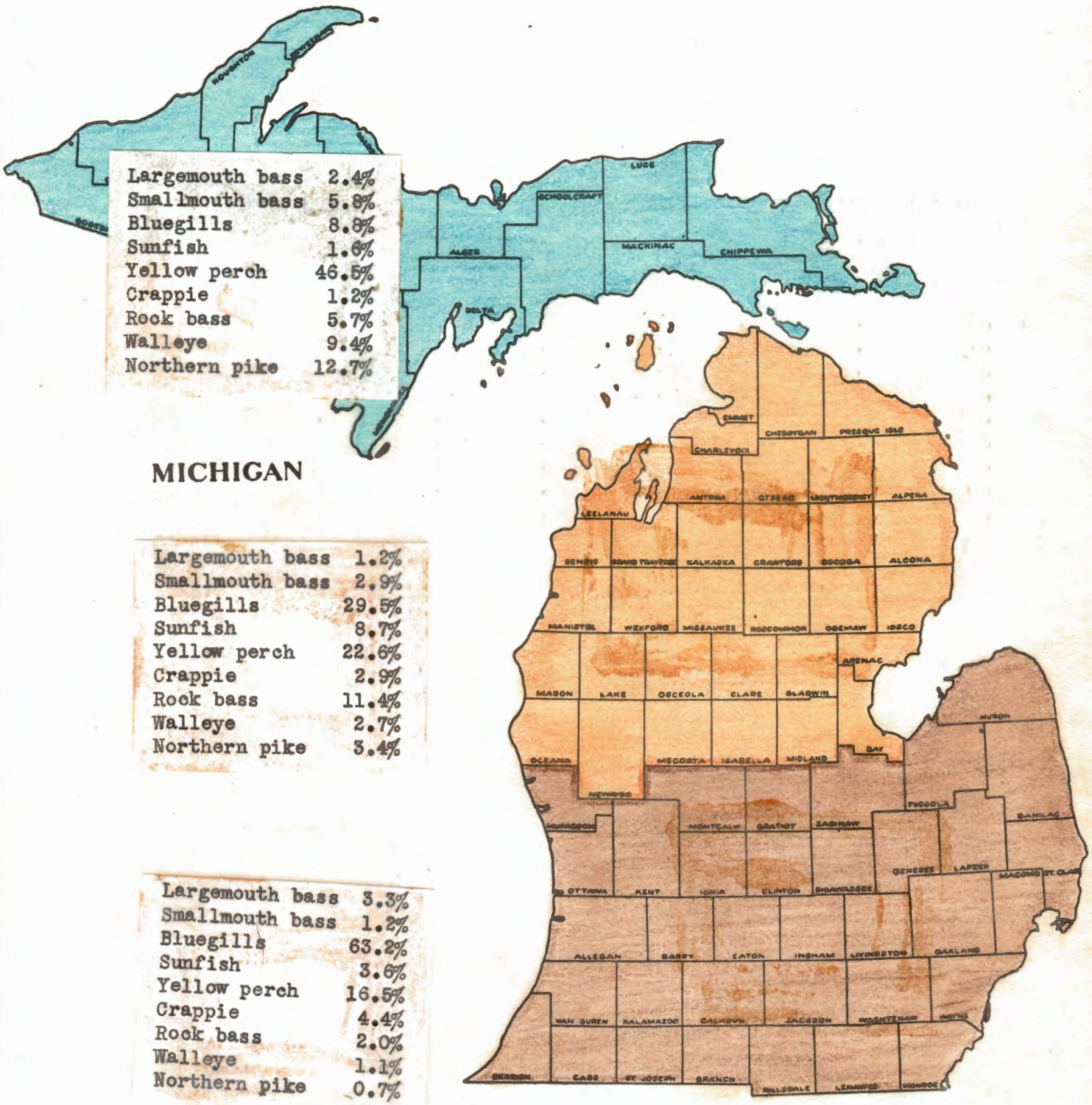
Species	District I Upper Peninsula		District II N. half of L.P.		District III S. half of L.P.		Total
	No.	%	No.	%	No.	%	
Largemouth bass	210	9.8	595	27.7	1,342	62.5	2,147
Smallmouth bass	513	21.5	1,390	58.3	482	20.2	2,385
Bluegill	778	1.9	13,644	33.8	25,887	64.2	40,309
Sunfish	143	2.6	4,170	76.3	1,155	21.1	5,468
Yellow perch	4,092	18.9	10,827	49.9	6,767	31.2	21,686
Crappie	102	3.1	1,393	42.4	1,791	54.5	3,286
Rock bass	506	7.5	5,466	80.7	804	11.9	6,776
Walleye	831	32.4	1,275	49.8	455	17.8	2,561
Northern pike	1,121	37.0	1,623	53.6	287	9.5	3,029

District I includes hatchery districts 1 and 2.

District II includes hatchery districts 3, 4, 5, 6, 7.

District III includes hatchery districts 8, 9, 10, 11.

Total is total number of fish caught of each species for the entire state.



GA-125

Map 2. Percentage composition of the angler's catch, according to species, in each of three geographical districts of Michigan

Comparison of Resident and Non-Resident Anglers

Data on the relative catch by resident and non-resident anglers were compiled by hatchery districts and are recorded in Table XIII. Page 5 may be referred to for the percentage of fishing by non-resident anglers as shown by hatchery districts in Table II.

TABLE XIII

Comparison of resident and non-resident anglers

for all waters

District	No. of Fishermen		No. of Hours Fished		No. of Fish Caught		Catch Per Hour	
	Resident	Non-resident	Resident	Non-resident	Resident	Non-resident	Resident	Non-resident
1	2,170	326	8,232.25	1,218.00	4,701	801	0.6	0.7
2	2,597	446	9,171.25	1,631.75	10,258	1,682	1.1	1.0
3	1,308	409	4,236.25	1,169.25	5,545	1,155	1.3	1.0
4	4,154	1,456	11,660.50	3,774.00	14,244	3,149	1.2	0.8
5	5,846	1,125	19,288.50	3,034.00	18,271	2,724	0.9	0.9
6	647	110	2,343.50	376.75	2,504	172	1.1	0.5
7	1,875	211	5,973.75	731.50	7,800	888	1.3	1.2
8	1,728	31	5,531.00	55.75	7,582	35	1.4	0.6
9	1,648	683	5,935.25	2,655.75	8,007	3,235	1.3	1.2
10	1,338	105	3,939.50	276.50	6,089	325	1.5	1.2
11	4,024	195	17,190.25	606.50	15,858	424	0.9	0.7
Total	27,335	5,097	93,502.00	15,529.75	100,859	14,590	1.1	0.9

For the state as a whole, 16% represent records of non-resident anglers. This is 1.8% higher than 1938. The percentage of non-residents as determined from the license sales was ~~18.6%~~ 23.5% ~~2.6~~ 7.5% higher than the figure derived from the general census. The greatest percentage of non-resident fishing on all waters was in hatchery district 9 where 29% were non-resident. This district also led in 1938. The least number of non-resident fishermen for 1939 was

recorded from hatchery district number 11 where 5% were non-resident anglers. The percentage of non-resident trout fishermen as shown by the general census was 7% in 1939. This is 1% higher than the preceding year. 34% of the non-resident trout fishermen took no fish. This is 14% lower than for the preceding year. (33% of the resident trout fishermen took no fish in 1939.) No reason for the 14% reduction in no-fish records is apparent at this time. On trout waters the catch per hour for non-resident and resident anglers was 0.7 and 0.8 respectively for 1939. This approximates the preceding year when the catch per hour was 0.7 and 0.9 respectively. On non-trout waters 18% of the fishermen were non-resident. This is 1% higher than in 1938. 36% of these fishermen caught no fish, as compared with 32% in 1938. 33% of the resident fishermen on non-trout waters caught no fish in 1939. The catch per hour of non-resident and resident fishermen was 1.0 and 1.1 respectively in 1939, and in 1938 was 1.1 and 1.5 respectively.

As in 1938, by far the greatest number of non-resident fishermen came from Ohio. Records were obtained from 2,765 Ohio fishermen. This represents 54.2% of the total non-resident fishing records. Indiana was second with 23.1% of the total non-resident fishing records, followed by Illinois and Wisconsin in order. In all, 5,097 records were obtained from non-resident anglers coming from 27 states, the District of Columbia, Territorial Alaska, and Canada. Table XIV shows the number of outstate anglers, the percentages of the numerically more important ones.

TABLE XIV

Residence of fishermen

Resident Anglers				Out of State Anglers		
County	No.	County	No.	State or Territory	No.	%
Alcona	142	Manistee	605	Arizona	1	...
Alger	196	Marquette	313	California	55	1.1
Allegan	207	Mason	118	Florida	11	...
Alpena	85	Mecosta	22	Georgia	2	...
Antrim	397	Menominee	115	Illinois	726	14.2
Arenac	54	Midland	272	Indiana	1,179	23.1
Baraga	311	Missaukee	152	Iowa	5	...
Barry	315	Monroe	90	Kansas	7	...
Bay	218	Montcalm	276	Kentucky	34	0.7
Benzie	214	Montmorency	104	Massachusetts	2	...
Berrien	184	Muskegon	272	Maryland	2	...
Branch	307	Newaygo	112	Minnesota	8	...
Calhoun	545	Oakland	675	Missouri	33	0.6
Cass	38	Oceana	268	Nebraska	1	...
Charlevoix	115	Ogemaw	34	New Jersey	3	...
Cheboygan	59	Ontonagon	167	New York	45	0.9
Chippewa	319	Osceola	242	North Dakota	12	...
Clare	107	Oscoda	111	Ohio	2,765	54.2
Clinton	98	Otsego	19	Oklahoma	1	...
Crawford	154	Ottawa	152	Oregon	1	...
Delta	643	Presque Isle	282	Pennsylvania	28	0.5
Dickinson	189	Roscommon	479	Rhode Island	3	...
Eaton	225	Saginaw	729	Tennessee	1	...
Emmet	103	St. Clair	333	Texas	10	...
Genesee	1,480	St. Joseph	77	Virginia	1	...
Gladwin	98	Sanilac	17	West Virginia	25	0.5
Gogebic	542	Schoolcraft	156	Washington D.C.	6	...
Grd. Traverse	472	Shiawassee	188	Wisconsin	125	2.5
Gratiot	251	Tuscola	104			. .
Hillsdale	286	Van Buren	189	Alaska	2	...
Houghton	400	Washtenaw	164			
Huron	62	Wayne	3,512	Canada	3	...
Ingham	1,697	Wexford	668			
Ionia	171			Total	5,097	
Iosco	18					
Iron	554	Total	27,335			
Isabella	168					
Jackson	813					
Kalamazoo	587					
Kalkaska	137					
Kent	1,675					
Keweenaw	16					
Lake	179					
Lapeer	92					
Leelanau	321					
Lenawee	417					
Livingston	105					
Luce	277					
Mackinac	131					
Macomb	144					

Male and Female Anglers

Table XV shows the comparisons for male and female anglers for all waters by hatchery districts.

TABLE XV

Comparison of female and male anglers for all waters by hatchery districts

District	No. of Anglers		No. of hours fished		No. of legal fish		Catch/hr.	
	Male	Female	Male	Female	Male	Female	Male	Female
1	2,394	102	9,141.75	308.50	5,385	117	0.6	0.4
2	2,809	234	10,013.75	789.25	11,258	682	1.1	0.9
3	1,470	247	4,793.75	611.75	6,022	678	1.3	1.1
4	4,792	818	13,475.25	1,959.25	15,870	1,523	1.2	0.8
5	5,895	1,076	19,469.75	2,852.75	18,461	2,534	0.9	0.9
6	702	55	2,533.75	186.50	2,571	105	1.0	0.6
7	1,903	183	6,200.25	505.00	8,045	643	1.3	1.3
8	1,607	152	5,196.75	390.00	7,205	412	1.4	1.1
9	2,186	145	8,111.50	479.50	10,894	348	1.3	0.7
10	1,248	195	3,781.00	435.00	5,866	548	1.6	1.3
11	3,653	566	15,637.25	2,159.50	14,365	1,917	0.9	0.9
Total	28,659	3,773	98,354.75	10,677.00	105,942	9,507	1.1 weighted ave.	0.9
							1.1 simple ave.	0.9

The percentage of female anglers for all classifications of waters showed an increase in 1939 over all previous records of the general census, reaching 11.6%, a rise of 4.8% over 1938. This 11.6 figure is below that recorded by the intensive censuses, but it would seem that the Conservation Officers are avoiding the ladies less than in previous years, or that more ladies are fishing. In 1939 the ladies averaged 0.2 of a fish per hour less than the men, the catch per hour for the male anglers being 1.1 and the female 0.9. In 1938 the catch per hour for both sexes was identical, being

1.3. On trout waters the male angler averaged twice as good as indicated by the catch per hour of 0.8 and 0.4 respectively. In 1938 it was 0.9 and 0.5 respectively.

Number of Fishermen Catching No Fish

From the general census records for 1939 the chances of the angler taking fish were 3 to 1. This is true for all classifications of waters. With minor shifts these figures are the same as for 1938, and are likewise similar to the findings of Eschmeyer on Fife Lake in 1934. According to the 1939 records, 33% took no fish in trout waters; 34% took no fish in non-trout waters and all waters.

Size of All Fish for All Waters

The average size of all fish for all waters in 1939 was 8.7 inches, which is 0.2 of an inch longer than in 1938. Bluegills averaged 7.5 inches, a fairly constant figure for the last 5 years. Yellow perch averaged 8.1 inches; largemouth bass 12.8 inches; smallmouth bass 13 inches; northern pike 20.6 inches. These figures for the different species have remained nearly constant over the last five year period. The figures for the different species from 1935 through 1939 are given in Table XVI showing comparisons of fishing.

TABLE XVI

Comparison of the fishing, 1935-1936-1937-1938-1939

	1935	1936	1937	1938	1939
1. Catch per hour--all waters	1.5	1.4	1.5	1.3	1.1
2. Catch per hour--resident, all waters	1.6	1.4	1.5	1.3	1.1
3. Catch per hour--non-resident, all waters	1.4	1.2	1.1	1.1	0.9
4. Catch per hour--male anglers, all waters	1.5	1.4	1.5	1.3	1.1
5. Catch per hour--female anglers, all waters	1.4	1.4	1.3	1.3	0.9
6. Catch per hour--trout waters	0.8	0.8	0.8	0.9	0.8
7. Catch per hour--resident, trout waters	0.8	0.8	0.8	0.9	0.8
8. Catch per hour--non-resident, trout waters	1.1	0.5	0.6	0.7	0.7
9. Catch per hour--male anglers, trout waters	0.9	0.8	0.8	0.9	0.8
10. Catch per hour--female anglers, trout waters	0.5	0.5	0.5	0.5	0.4
11. Catch per hour--non-trout waters	1.9	1.7	1.7	1.4	1.1
12. Catch per hour--resident, non-trout waters	2.0	1.7	1.8	1.5	1.1
13. Catch per hour--non-resident, non-trout waters	1.4	1.4	1.2	1.1	1.0
14. Catch per hour--male anglers, non-trout waters	1.9	1.7	1.7	1.4	1.1
15. Catch per hour--female anglers, non-trout waters	1.7	1.6	1.4	1.4	0.9
16. Percent of trout fishermen represented by non-residents	9.0	8.5	7.0	6.0	7.0
17. Percent of non-trout fishermen represented by non-residents	14.0	20.0	20.0	17.0	18.0
18. Percentage of all fishermen represented by female anglers	6.0	7.0	7.5	6.0	11.6
19. Percentage of trout fishermen represented by female anglers	4.5	4.0	4.0	3.0	4.0
20. Percentage of non-trout fishermen represented by female anglers	7.0	8.0	9.0	7.0	13.0
21. Percent of fishermen taking no fish, trout waters	---	---	---	34.0	33.0
22. Percent of fishermen taking no fish, non-trout waters	---	---	---	30.0	34.0
23. Percent of fisherman taking no fish, all waters	---	---	---	31.0	34.0
24. Average size of all fish caught (inches):					
All fish	8.7	8.4	8.8	8.5	8.7
Brook trout	8.6*	8.6**	8.3**	8.7**	8.6**
Rainbow trout	12.1	9.7	10.5	10.3	10.0
Brown trout	10.0	10.4	10.5	10.4	10.6
Northern pike	21.4	19.7	20.6	20.3	20.6
Largemouth bass	14.0	13.2	13.0	13.1	12.8
Smallmouth bass	13.0	13.0	12.7	12.8	13.0
Bluegills	7.4	7.4	7.5	7.5	7.5
Perch	8.1	8.0	8.2	8.0	8.1

* = simple average

** = weighted average

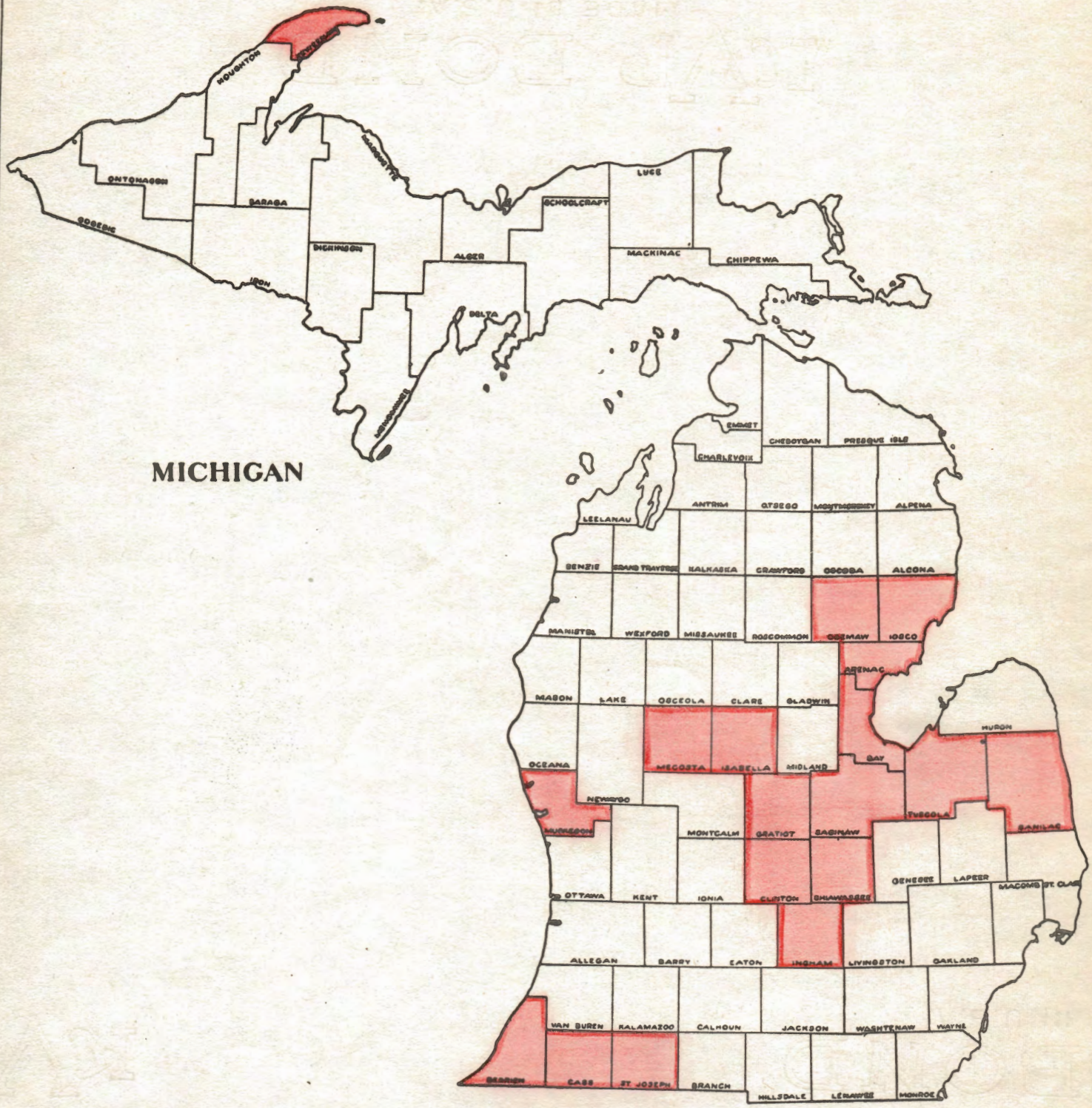
Report typed by: Alma Hartrick

INSTITUTE FOR FISHERIES RESEARCH

REPORT NO.625 - APPENDIX

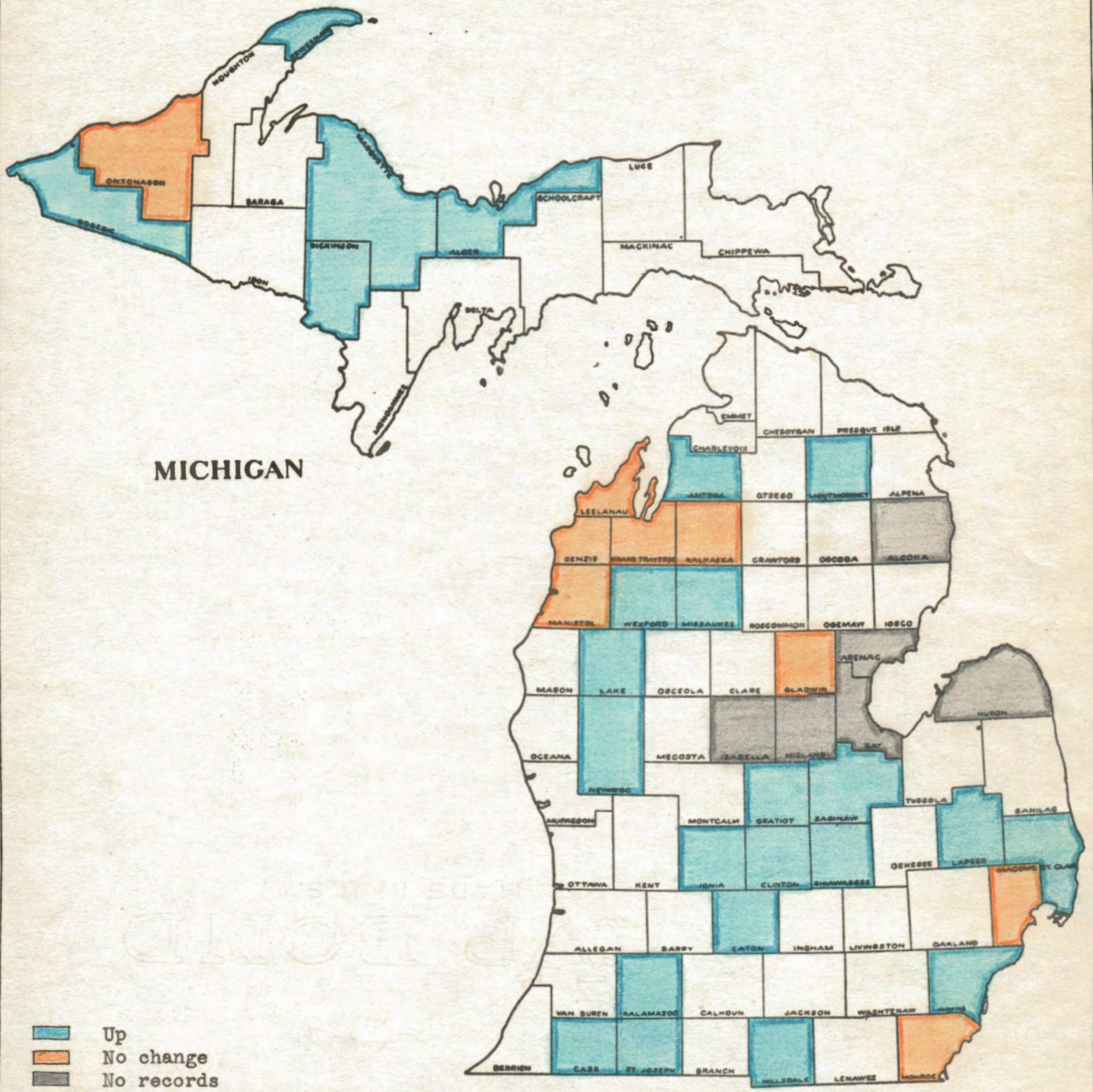
GA-125

FISH DIVISION DISTRICTS



GA-125

Counties with less than 100 records sent in - 1939



GA-125

The change in the catch per hour from 1938 to 1939 by counties
(Catch per hour, all waters)

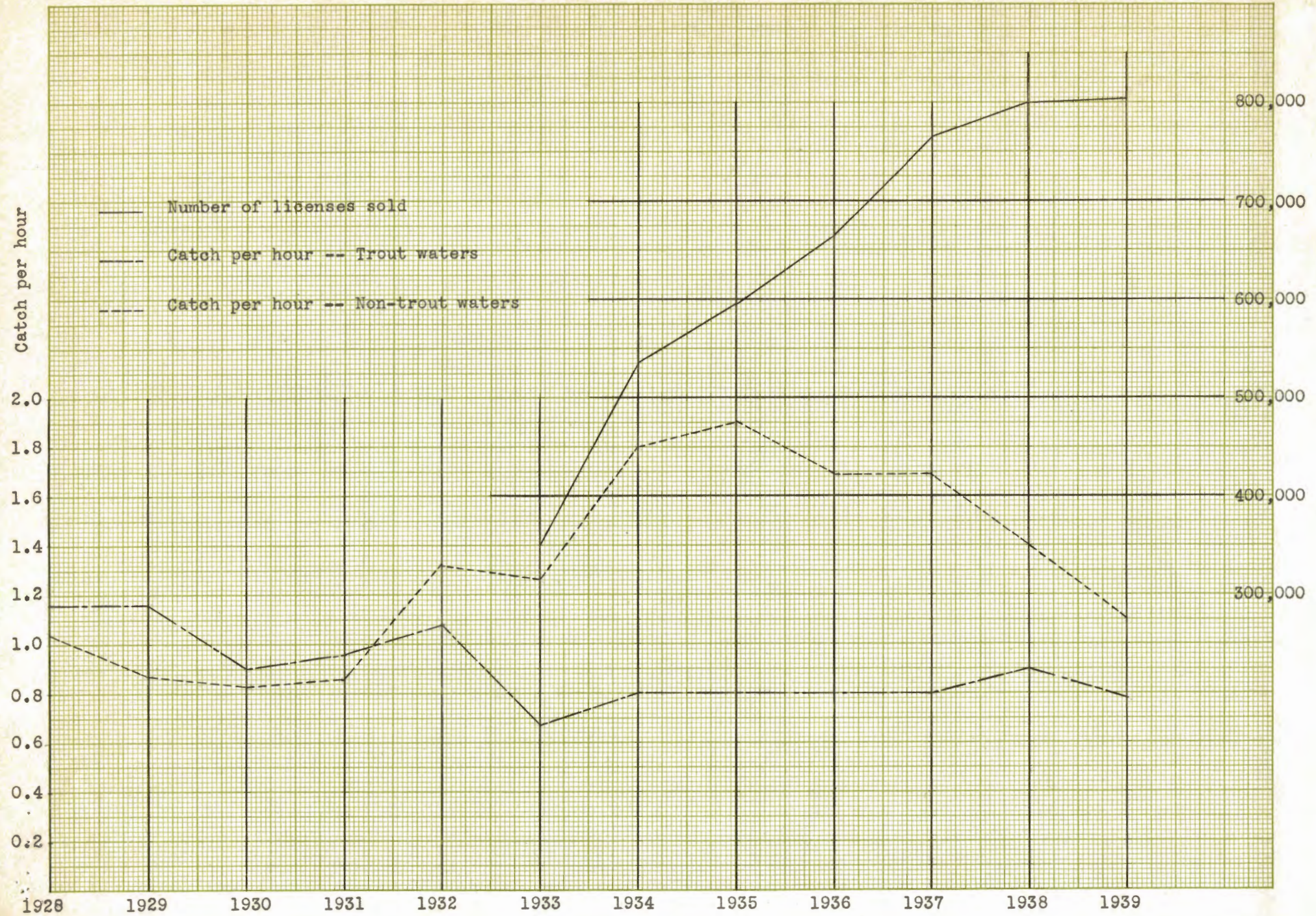
APPENDIX 4

Comparison of the fishing -

twelve year period - 1928 through 1939

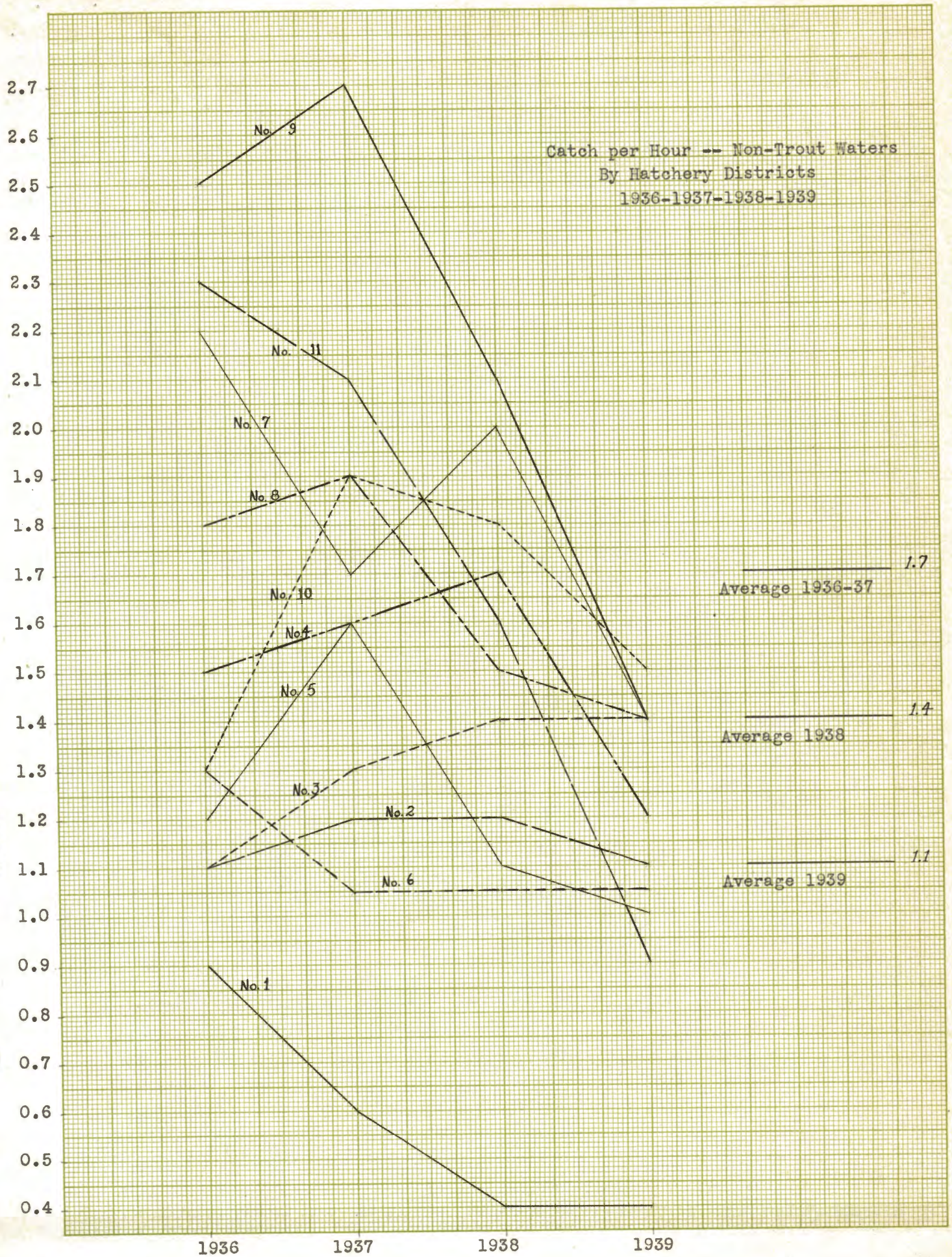
Year	Catch per hour		
	All waters	Trout waters	Non-trout waters
1928	1.09	1.17	1.05
1929	0.96	1.17	0.88
1930	0.88	0.93	0.85
1931	0.91	0.97	0.88
1932	1.26	1.10	1.32
1933	0.97	0.68	1.28
1934	1.6	0.79	1.80
1935	1.5	0.8	1.9
1936	1.4	0.8	1.7
1937	1.5	0.8	1.7
1938	1.3	0.9	1.4
1939	1.1	0.8	1.1
Average	1.21	0.91	1.32

APPENDIX 4 - CHART A



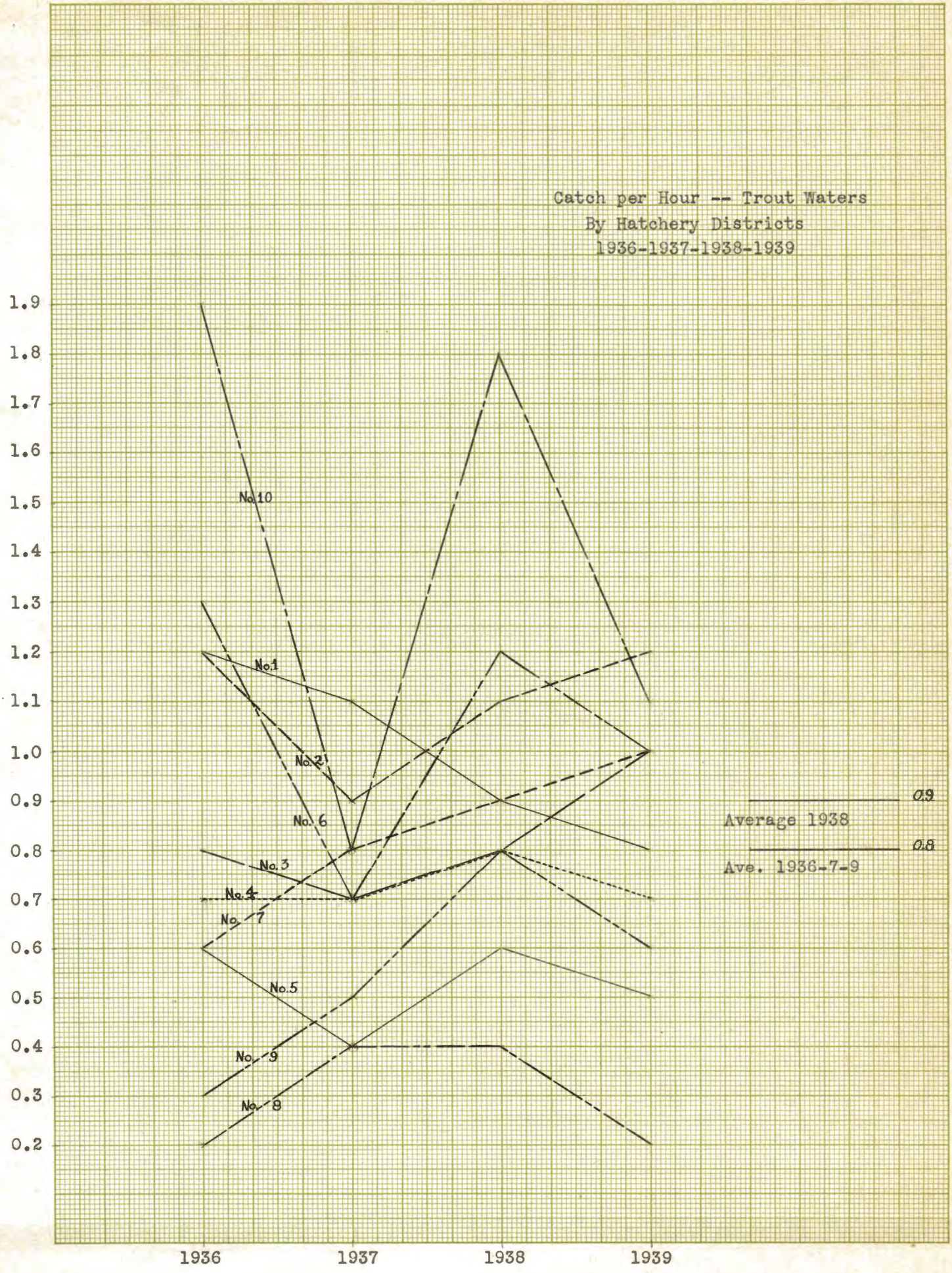
KEUFFEL & ESSER CO., N. Y. NO. 358-14
Millimeters, 10th lines heavy.
MADE IN U. S. A.

APPENDIX 4 - CHART B



KEUFFEL & ESSER CO., N. Y. NO. 358-14
Millimeters, 10th line heavy.
MADE IN U. S. A.

APPENDIX 4 - CHART C



KEUFFEL & ESSER CO., N. Y. NO. 358-14
Millimeters, 10th lines heavy.
MADE IN U. S. A.

APPENDIX 5

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, trout waters - resident, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	78	13	285.50	321	1.1
Alger	171	22	748.25	886	1.2
Allegan	72	25	281.50	165	0.6
Alpena	2	1	16.50	7	0.4
Antrim	74	19	208.00	273	1.3
Arenac	79	32	236.00	106	0.4
Baraga	374	171	1,237.25	1,215	1.0
Barry	10	1	53.00	62	1.2
Bay	...	...	.....	...	...
Benzie	250	117	1,124.50	449	0.4
Berrien	9	1	19.00	27	1.4
Branch	...	...	...	...	...
Calhoun	1	0	4.00	1	0.3
Cass	2	0	12.00	7	0.6
Charlevoix	...	...	...	...	...
Cheboygan	119	46	417.50	278	0.7
Chippewa	116	38	427.75	522	1.2
Clare	107	39	428.00	302	0.7
Clinton	...	...	...	...	...
Crawford	111	17	685.00	452	0.7
Delta	118	26	483.50	358	0.7
Dickinson	93	3	394.75	498	1.3
Eaton	...	...	...	...	...
Emmet	45	14	129.75	171	1.3
Genesee	...	...	...	...	...
Gladwin	14	4	83.75	44	0.5
Gogebic	237	152	1,037.00	280	0.3
Grd. Traverse	72	22	210.75	162	0.8
Gratiot	...	...	...	...	...
Hillsdale	21	14	71.50	12	0.2
Houghton	120	30	366.75	536	1.5
Huron	...	...	...	...	...
Ingham	...	...	...	...	...
Ionia	...	...	...	...	...
Iosco	...	...	...	...	...
Iron	207	75	668.00	647	1.0
Isabella	...	...	...	...	...
Jackson	...	...	...	...	...
Kalamazoo	66	26	259.25	173	0.7
Kalkaska	25	5	128.50	89	0.7
Kent	47	31	153.25	31	0.2
Keweenaw	26	6	107.50	113	1.1
Lake	294	68	1,059.25	1,236	1.2
Lapeer	...	...	...	...	...
Leelanau	31	7	96.50	56	0.6
Lenawee	...	...	...	...	...
Livingston	...	...	...	...	...
Luce	181	41	669.25	892	1.3
Mackinac	54	15	191.75	199	1.0

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Macomb	...	...	....	...	...
Manistee	194	34	620.25	810	1.3
Marquette	171	34	735.25	782	1.1
Mason	26	6	96.00	82	0.9
Mecosta	...	...	...	...	...
Menominee	152	41	423.50	503	1.2
Midland	...	...	...	...	...
Missaukee	94	42	430.25	191	0.4
Monroe	...	...	...	...	...
Montcalm	...	...	...	...	...
Montmorency	76	33	264.50	245	0.9
Muskegon	...	...	...	...	...
Newaygo	33	2	98.00	244	2.5
Oakland	4	3	14.50	1	0.1
Oceana	49	7	175.50	163	0.9
Ogemaw	6	2	28.50	24	0.8
Ontonagon	83	37	284.75	176	0.6
Osceola	61	32	184.00	100	0.5
Oscoda	556	240	2,591.50	937	0.4
Otsego	85	12	393.75	368	0.9
Ottawa	9	3	28.50	14	0.5
Presque Isle	69	12	207.50	450	2.2
Roscommon	19	5	74.00	78	1.1
Saginaw	...	...	...	...	...
St. Clair	...	...	...	...	...
St. Joseph	...	...	...	...	...
Sanilac	...	...	...	...	...
Schoolcraft	95	11	367.00	568	1.5
Shiawassee	...	...	...	...	...
Tuscola	...	...	...	...	...
Van Buren	.35	.12	158.50	.86	0.5
Washtenaw	...	...	...	...	...
Wayne	...	...	...	...	...
Wexford	119	52	406.50	278	0.7
Totals	5,162	1,701	19,877.00	16,670	0.8

*33% of the fishermen took no fish.

APPENDIX 6

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, trout waters - non-resident, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	...	...	...	...	...
Alger	3	0	33.00	30	0.9
Allegan	2	0	12.00	13	1.1
Alpena	...	...	...	...	...
Antrim	13	4	35.75	33	0.9
Arenac	1	1	0.75	0	0.0
Baraga	32	10	91.00	122	1.3
Barry	...	...	...	...	...
Bay	...	...	...	...	...
Benzie	31	16	114.75	53	0.5
Berrien	...	...	...	...	...
Branch	...	...	...	...	...
Calhoun	...	...	...	...	...
Cass	...	...	...	...	...
Charlevoix	...	...	...	...	...
Cheboygan	21	9	82.00	58	0.7
Chippewa	...	...	...	...	...
Clare	3	0	25.50	10	0.4
Clinton	...	...	...	...	...
Crawford	7	5	35.50	38	1.1
Delta	5	3	11.50	2	0.2
Dickinson	...	...	...	...	...
Eaton	...	...	...	...	...
Emmet	10	2	35.25	38	1.1
Genesee	...	...	...	...	...
Gladwin	...	...	...	...	...
Gogebic	11	4	32.00	12	0.4
Grd. Traverse	4	2	7.00	8	1.1
Gratiot	...	...	...	...	...
Hillsdale	...	...	...	...	...
Houghton	...	...	...	...	...
Huron	...	...	...	...	...
Ingham	...	...	...	...	...
Ionia	...	...	...	...	...
Iosco	...	...	...	...	...
Iron	39	13	157.50	158	1.0
Isabella	...	...	...	...	...
Jackson	...	...	...	...	...
Kalamazoo	...	...	...	...	...
Kalkaska	6	0	57.00	12	0.2
Kent	...	...	...	...	...
Keweenaw	...	...	...	...	...
Lake	31	2	171.25	163	0.9
Lapeer	...	...	...	...	...
Leelanau	3	1	6.50	2	0.3
Lenawee	...	...	...	...	...
Livingston	...	...	...	...	...
Luce	15	2	95.50	81	0.8
Mackinac	7	5	19.00	2	0.1

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Macomb	...	...	...	...	...
Manistee	15	2	57.75	92	1.6
Marquette	8	1	33.50	32	1.0
Mason	...	...	...	...	...
Mecosta	...	...	...	...	...
Menominee	4	1	15.50	11	0.7
Midland	...	...	...	...	...
Missaukee	2	0	6.00	4	0.7
Monroe	...	...	...	...	...
Montcalm	...	...	...	...	...
Montmorency	1	1	3.00	0	0.0
Muskegon	...	...	...	...	...
Newaygo	2	0	5.00	3	0.6
Oakland	...	...	...	...	...
Oceana	...	...	...	...	...
Ogemaw	...	...	...	...	...
Ontonagon	4	4	6.50	0	0.0
Osceola	1	1	2.00	0	0.0
Oscoda	47	13	292.00	87	0.3
Otsego	22	14	148.00	65	0.4
Ottawa	...	...	...	...	...
Presque Isle	4	4	12.00	0	0.0
Roscommon	3	0	9.00	24	2.7
Saginaw	...	...	...	...	...
St. Clair	...	...	...	...	...
St. Joseph	...	...	...	...	...
Sanilac	...	...	...	...	...
Schoolcraft	9	3	14.00	16	1.1
Shiawassee	...	...	...	...	...
Tuscola	...	...	...	...	...
Van Buren	...	...	...	...	...
Washtenaw	...	...	...	...	...
Wayne	...	...	...	...	...
Wexford	...	...	...	...	...
Total	366	123	1,627.00	1,169	0.7

*34% of the fishermen took no fish.

APPENDIX 7

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, for all fishermen, non-trout waters, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	170	30	641.00	498	0.8
Alger	104	12	350.00	323	0.9
Allegan	431	167	1,529.50	1,211	0.8
Alpena	167	61	668.00	796	1.2
Antrim	903	243	2,445.25	3,060	1.3
Arenac	3	0	12.00	7	0.6
Baraga	180	65	1,010.00	358	0.4
Barry	356	77	1,161.00	2,126	1.8
Bay	...	...	...	...	...
Benzie	893	390	2,319.75	4,481	1.9
Berrien	11	2	32.00	47	1.5
Branch	754	211	2,449.75	4,347	1.8
Calhoun	293	70	954.75	1,134	1.2
Cass	49	6	193.25	407	2.1
Charlevoix	148	23	512.50	1,212	2.4
Cheboygan	17	0	77.00	54	0.7
Chippewa	396	138	1,263.00	1,838	1.5
Clare	225	115	736.50	347	0.5
Clinton	65	30	195.00	259	1.3
Crawford	136	64	565.00	326	0.6
Delta	557	226	1,916.50	1,399	0.7
Dickinson	17	2	62.00	81	1.3
Eaton	147	20	629.00	799	1.3
Emmet	112	7	370.75	509	1.4
Genesee	275	48	957.50	2,037	2.1
Gladwin	458	242	1,660.75	957	0.6
Gogebic	481	219	2,018.25	866	0.4
Grd. Traverse	281	96	755.75	925	1.2
Gratiot	67	7	306.00	662	2.2
Hillsdale	419	84	1,981.50	2,530	1.3
Houghton	86	38	190.50	184	1.0
Huron	482	103	3,918.00	3,560	0.9
Ingham	2	0	12.00	15	1.3
Ionia	103	29	217.00	503	2.3
Iosco	9	1	75.00	28	0.4
Iron	466	236	1,696.75	704	0.4
Isabella	...	...	...	...	...
Jackson	634	180	1,402.25	2,277	1.6
Kalamazoo	77	19	376.75	598	1.6
Kalkaska	138	30	462.50	425	0.9
Kent	964	378	2,754.25	3,773	1.4
Keweenaw	31	14	165.00	34	0.2
Lake	195	23	516.25	1,126	2.2
Lapeer	260	31	855.00	1,381	1.6
Leelanau	1,007	384	2,163.75	2,857	1.3
Lenawee	434	155	1,522.25	1,080	0.7
Livingston	328	86	1,022.25	1,496	1.5
Luce	219	76	893.00	877	1.0
Mackinac	135	21	556.00	798	1.4
Macomb	104	56	430.50	410	1.0

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Manistee	1,148	479	3,512.50	3,944	1.1
Marquette	148	29	424.75	458	1.1
Mason	144	82	501.00	442	0.9
Mecosta	8	5	12.00	3	0.3
Menominee	27	9	95.00	59	0.6
Midland	127	62	205.50	289	1.4
Missaukee	255	92	793.00	774	1.0
Monroe	275	97	1,245.75	840	0.7
Montcalm	346	106	1,507.25	1,819	1.2
Montmorency	165	48	576.00	2,180	3.8
Muskegon	15	0	31.50	75	2.4
Newaygo	157	24	480.00	772	1.6
Oakland	621	176	2,099.25	2,065	1.0
Oceana	522	147	1,445.50	2,356	1.6
Ogemaw	8	5	16.00	14	0.9
Ontonagon	119	68	381.50	97	0.3
Osceola	228	32	769.50	1,339	1.7
Oscoda	629	149	2,730.00	2,276	0.8
Otsego	2	1	16.00	6	0.4
Ottawa	143	44	394.00	481	1.2
Presque Isle	321	88	1,100.00	1,038	0.9
Roscommon	4,608	1,611	12,502.50	13,024	1.0
Saginaw	7	0	65.00	52	0.8
St. Clair	507	228	1,998.00	699	0.3
St. Joseph	43	24	161.00	106	0.7
Sanilac	52	1	239.00	438	1.8
Schoolcraft	238	83	579.75	725	1.3
Shiawassee	21	9	155.00	82	0.5
Tuscola	91	6	465.50	613	1.3
Van Buren	340	30	1,053.50	1,513	1.4
Washtenaw	115	38	308.25	393	1.3
Wayne	643	312	2,501.00	1,135	0.5
Wexford	1,042	530	2,161.00	1,781	0.8
Total	26,904	9,130	87,527.75	97,610	1.1

*34% of the fishermen took no fish.

APPENDIX 8

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour for all fishermen, trout waters, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	78	13	285.50	321	1.1
Alger	174	22	781.25	916	1.2
Allegan	74	25	293.50	178	0.6
Alpena	2	1	16.50	7	0.4
Antrim	87	23	243.75	306	1.3
Arenac	80	33	236.75	106	0.4
Baraga	406	181	1,328.25	1,337	1.0
Barry	10	1	53.00	62	1.2
Bay	...	...	...	...	...
Benzie	281	133	1,239.25	502	0.4
Berrien	9	1	19.00	27	1.4
Branch	...	...	...	...	...
Calhoun	1	0	4.00	1	0.3
Cass	2	0	12.00	7	0.6
Charlevoix	...	...	...	...	...
Cheboygan	140	55	499.50	336	0.7
Chippewa	116	38	427.75	522	1.2
Clare	110	39	453.50	312	0.7
Clinton	...	...	...	...	...
Crawford	118	22	720.50	490	0.7
Delta	123	29	495.00	360	0.7
Dickinson	93	3	394.75	498	1.3
Eaton	...	...	...	...	...
Emmet	55	16	165.00	209	1.3
Genesee	...	...	...	...	...
Gladwin	14	4	83.75	44	0.5
Gogebic	248	156	1,069.00	292	0.3
Grd. Traverse	76	24	217.75	170	0.8
Gratiot	...	...	...	...	...
Hillsdale	21	14	71.50	12	0.2
Houghton	120	30	366.75	536	1.5
Huron	...	...	...	...	...
Ingham	...	...	...	...	...
Ionia	...	...	...	...	...
Iosco	...	...	...	...	...
Iron	246	88	825.50	805	1.0
Isabella	...	...	...	...	...
Jackson	...	...	...	...	...
Kalamazoo	66	26	259.25	173	0.7
Kalkaska	31	5	185.50	101	0.5
Kent	47	31	153.25	31	0.2
Keweenaw	26	6	107.50	113	1.1
Lake	325	70	1,230.50	1,399	1.1
Lapeer	...	...	...	...	...
Leelanau	34	8	103.00	58	0.6
Lenawee	...	...	...	...	...
Livingston	...	...	...	...	...
Luce	196	43	764.75	973	1.3
Mackinac	61	20	210.75	201	1.0
Macomb	...	...	...	...	...

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Manistee	209	36	678.00	902	1.3
Marquette	179	35	768.75	814	1.1
Mason	26	6	96.00	82	0.9
Mecosta	...	...	...	...	...
Menominee	156	42	439.00	514	1.2
Midland	...	...	...	...	...
Missaukee	96	42	436.25	195	0.4
Monroe	...	...	...	...	...
Montcalm	...	...	...	...	...
Montmorency	77	34	267.50	245	0.9
Muskegon	...	...	...	...	...
Newaygo	35	2	103.00	247	2.4
Oakland	4	3	14.50	1	0.1
Oceana	49	7	175.50	163	0.9
Ogemaw	6	2	28.50	24	0.8
Ontonagon	87	41	291.25	176	0.6
Osceola	62	33	186.00	100	0.5
Oscoda	603	253	2,883.50	1,024	0.4
Otsego	107	26	541.75	433	0.8
Ottawa	9	3	28.50	14	0.5
Presque Isle	73	16	219.50	450	2.1
Roscommon	22	5	83.00	102	1.2
Saginaw	...	...	...	...	...
St. Clair	...	...	...	...	...
St. Joseph	...	...	...	...	...
Sanilac	...	...	...	...	...
Schoolcraft	104	14	381.00	584	1.5
Shiawassee	...	...	...	...	...
Tuscola	...	...	...	...	...
Van Buren	35	12	158.50	86	0.5
Washtenaw	...	...	...	...	...
Wayne	...	...	...	...	...
Wexford	119	52	406.50	278	0.7
Total	5,528	1,824	21,504.00	17,839	0.8

*33% of fishermen took no fish.

APPENDIX 9

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, non-trout waters - resident, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	148	25	569.00	434	0.8
Alger	87	6	275.00	267	1.0
Allegan	365	126	1,346.50	1,093	0.8
Alpena	134	51	543.00	752	1.4
Antrim	638	164	1,834.00	2,380	1.3
Arenac	3	0	12.00	7	0.6
Baraga	149	59	822.00	276	0.3
Barry	330	67	1,091.75	2,033	1.9
Bay	...	...	...	...	...
Benzie	563	228	1,513.50	3,966	2.6
Berrien	11	2	32.00	47	1.5
Branch	432	117	1,372.50	2,862	2.1
Calhoun	278	64	914.00	1,064	1.2
Cass	42	6	164.25	349	2.1
Charlevoix	144	23	505.00	1,182	2.3
Cheboygan	8	0	23.00	23	1.0
Chippewa	304	104	948.50	1,438	1.5
Clare	219	109	727.75	347	0.5
Clinton	65	30	195.00	259	1.3
Crawford	131	61	551.00	311	0.6
Delta	526	215	1,799.00	1,289	0.7
Dickinson	17	2	62.00	81	1.3
Eaton	143	18	615.00	796	1.3
Emmet	63	6	236.75	349	1.5
Genesee	275	48	957.50	2,037	2.1
Gladwin	430	229	1,556.25	897	0.6
Gogebic	361	175	1,515.25	704	0.5
Grd. Traverse	187	67	503.00	638	1.3
Gratiot	66	7	304.00	661	2.2
Hillsdale	258	62	1,005.25	1,417	1.4
Houghton	72	37	155.00	153	1.0
Huron	472	101	3,868.00	3,526	0.9
Ingham	2	0	12.00	15	1.3
Ionia	101	28	207.00	502	2.4
Iosco	9	1	75.00	28	0.4
Iron	396	210	1,529.75	474	0.3
Isabella	...	...	...	...	...
Jackson	574	162	1,249.75	2,118	1.7
Kalamazoo	74	19	363.75	575	1.6
Kalkaska	81	22	292.00	275	0.9
Kent	944	368	2,738.00	3,750	1.4
Keweenaw	28	14	129.00	31	0.2
Lake	123	11	309.50	767	2.5
Lapeer	260	31	855.00	1,381	1.6
Leelanau	710	261	1,588.75	2,235	1.4
Lenawee	362	129	1,314.50	955	0.7
Livingston	313	75	992.75	1,489	1.5
Luce	152	54	577.50	648	1.1
Mackinac	106	16	389.00	585	1.5
Macomb	104	56	430.50	410	1.0

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Manistee	719	290	2,221.00	2,881	1.3
Marquette	77	21	209.25	238	1.1
Mason	139	78	469.00	439	0.9
Mecosta	8	5	12.00	3	0.3
Menominee	27	9	95.00	59	0.6
Midland	126	62	204.50	284	1.4
Missaukee	215	77	675.50	670	1.0
Monroe	205	69	986.75	621	0.6
Montcalm	346	106	1,507.25	1,819	1.2
Montmorency	134	35	478.00	1,876	3.9
Muskegon	15	0	31.50	75	2.4
Newaygo	143	18	419.00	739	1.8
Oakland	619	176	2,092.75	2,062	1.0
Oceana	462	117	1,297.25	2,217	1.7
Ogemaw	8	5	16.00	14	0.9
Ontonagon	117	67	380.00	96	0.3
Osceola	211	32	698.50	1,161	1.7
Oscoda	540	138	2,289.50	1,848	0.8
Otsego	...	...	...	...	...
Ottawa	135	40	366.50	471	1.3
Presque Isle	257	71	887.50	920	1.0
Roscommon	3,695	1,230	10,466.00	11,261	1.1
Saginaw	7	0	65.00	52	0.8
St. Clair	504	228	1,986.50	695	0.3
St. Joseph	39	20	149.00	106	0.7
Sanilac	52	1	239.00	438	1.8
Schoolcraft	150	50	375.00	445	1.2
Shiawassee	20	8	152.50	82	0.5
Tuscola	88	3	453.50	613	1.4
Van Buren	222	15	700.25	1,088	1.6
Washtenaw	98	30	282.50	367	1.3
Wayne	641	312	2,499.00	1,129	0.5
Wexford	894	453	1,849.50	1,544	0.8
Total	22,173	7,432	73,625.00	84,189	1.1

*34% of fishermen took no fish.

APPENDIX 10

Number of fishermen, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	248	43	926.50	819	0.9
Alger	278	34	1,131.25	1,239	1.1
Allegan	505	192	1,823.00	1,389	0.8
Alpena	169	62	684.50	803	1.2
Antrim	990	266	2,689.00	3,366	1.3
Arenac	83	33	248.75	113	0.5
Baraga	586	246	2,338.25	1,695	0.7
Barry	366	78	1,214.00	2,188	1.8
Bay	...	...	...	...	...
Benzie	1,174	523	3,559.00	4,983	1.4
Berrien	20	3	51.00	74	1.4
Branch	754	211	2,449.75	4,347	1.8
Calhoun	294	70	958.75	1,135	1.2
Cass	51	6	205.25	414	2.0
Charlevoix	148	23	512.50	1,212	2.4
Cheboygan	157	55	576.50	390	0.7
Chippewa	512	176	1,690.75	2,360	1.4
Clare	335	154	1,190.00	659	0.6
Clinton	65	30	195.00	259	1.3
Crawford	254	86	1,285.50	816	0.6
Delta	680	255	2,411.50	1,759	0.7
Dickinson	110	5	456.75	579	1.3
Eaton	147	20	629.00	799	1.3
Emmet	167	23	535.75	718	1.3
Genesee	275	48	957.50	2,037	2.1
Gladwin	472	246	1,744.50	1,001	0.6
Gogebic	729	375	3,087.25	1,158	0.4
Grd. Traverse	357	120	973.50	1,095	1.1
Gratiot	67	7	306.00	662	2.2
Hillsdale	440	98	2,053.00	2,542	1.2
Houghton	206	68	557.25	720	1.3
Huron	482	103	3,918.00	3,560	0.9
Ingham	2	...	12.00	15	1.3
Ionia	103	29	217.00	503	2.3
Iosco	9	1	75.00	28	0.4
Iron	712	324	2,522.25	1,509	0.6
Isabella	...	...	...	...	...
Jackson	634	180	1,402.25	2,277	1.6
Kalamazoo	143	45	636.00	771	1.2
Kalkaska	169	35	648.00	526	0.8
Kent	1,011	409	2,907.50	3,804	1.3
Keweenaw	57	20	272.50	147	0.5
Lake	520	93	1,746.75	2,525	1.4
Lapeer	260	31	855.00	1,381	1.6
Leelanau	1,041	392	2,266.75	2,915	1.3
Lenawee	434	155	1,522.25	1,080	0.7
Livingston	328	86	1,022.25	1,496	1.5
Luce	415	119	1,657.75	1,850	1.1
Mackinac	196	41	766.75	999	1.3
Macomb	104	56	430.50	410	1.0

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Manistee	1,357	515	4,190.50	4,846	1.2
Marquette	327	64	1,193.50	1,272	1.1
Mason	170	88	597.00	524	0.9
Mecosta	8	5	12.00	3	0.3
Menominee	183	51	534.00	573	1.1
Midland	127	62	205.50	289	1.4
Missaukee	351	134	1,229.25	.969.	0.8
Monroe	275	97	1,245.75	840	0.7
Montcalm	346	106	1,507.25	1,819	1.2
Montmorency	242	82	843.50	2,425	2.9
Muskegon	15	0	31.50	75	2.4
Newaygo	192	26	583.00	1,019	1.7
Oakland	625	179	2,113.75	2,066	1.0
Oceana	571	154	1,621.00	2,519	1.6
Ogemaw	14	7	44.50	38	0.9
Ontonagon	206	109	672.75	273	0.4
Osceola	290	65	955.50	1,439	1.5
Oscoda	1,232	402	5,613.50	3,300	0.6
Otsego	109	27	557.75	439	0.8
Ottawa	152	47	422.50	495	1.2
Presque Isle	394	104	1,319.50	1,488	1.1
Roscommon	4,630	1,616	12,585.50	13,126	1.0
Saginaw	7	0	65.00	52	0.8
St. Clair	507	228	1,998.00	699	0.3
St. Joseph	43	24	161.00	106	0.7
Sanilac	52	1	239.00	438	1.8
Schoolcraft	342	97	960.75	1,309	1.4
Shiawassee	21	9	155.00	82	0.5
Tuscola	91	6	465.50	613	1.3
Van Buren	375	42	1,212.00	1,599	1.3
Washtenaw	115	38	308.25	393	1.3
Wayne	643	312	2,501.00	1,135	0.5
Wexford	1,161	582	2,567.50	2,059	0.8
Total	32,432	10,954	109,031.75	115,449	1.1

*34% of fishermen took no fish.

APPENDIX 11

Number of fishermen contacted, number taking no fish, hours fished, number of legal-sized fish caught, and catch per hour, non-trout waters - non-resident, by counties.

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Alcona	22	5	72.00	64	0.9
Alger	17	6	75.00	56	0.7
Allegan	66	41	183.00	118	0.6
Alpena	33	10	125.00	44	0.4
Antrim	265	79	611.25	680	1.1
Arenac	...	...	...	...	...
Baraga	31	6	188.00	82	0.4
Barry	26	10	69.25	93	1.3
Bay	...	...	...	...	...
Benzie	330	162	806.25	515	0.6
Berrien	...	...	...	...	...
Branch	322	94	1,077.25	1,485	1.4
Calhoun	15	6	40.75	70	1.7
Cass	7	0	29.00	58	2.0
Charlevoix	4	0	7.50	30	4.0
Cheboygan	9	0	54.00	31	0.6
Chippewa	92	34	314.50	400	1.3
Clare	6	6	8.75	0	0.0
Clinton	...	...	...	...	...
Crawford	5	3	14.00	15	1.1
Delta	31	11	117.50	110	0.9
Dickinson	...	...	...	...	...
Eaton	4	2	14.00	3	0.2
Emmet	49	1	134.00	160	1.2
Genesee	...	...	...	...	...
Gladwin	28	13	104.50	60	0.6
Gogebic	120	44	503.00	162	0.3
Grd. Traverse	94	29	252.75	287	1.1
Gratiot	1	0	2.00	1	0.5
Hillsdale	161	22	976.25	1,113	1.1
Houghton	14	1	35.50	31	0.9
Huron	10	2	50.00	34	0.7
Ingham	...	...	...	...	...
Ionia	2	1	10.00	1	0.1
Iosco	...	...	...	...	...
Iron	70	26	167.00	230	1.4
Isabella	...	...	...	...	...
Jackson	60	18	152.50	159	1.0
Kalamazoo	3	0	13.00	23	1.8
Kalkaska	57	8	170.50	150	0.9
Kent	20	10	16.25	23	1.4
Keweenaw	3	0	36.00	3	0.1
Lake	72	12	206.75	359	1.7
Lapeer	...	...	...	...	...
Leelanau	297	123	575.00	622	1.1
Lenawee	72	26	207.75	125	0.6
Livingston	15	11	29.50	7	0.2
Luce	67	22	315.50	229	0.7
Mackinac	29	5	167.00	213	1.3
Macomb	...	...	...	...	...

County	No. of fishermen	No. taking no fish	No. of hours fished	No. of legal fish caught	Catch per hour
Manistee	429	189	1,291.50	1,063	0.8
Marquette	71	8	215.50	220	1.0
Mason	5	4	32.00	3	0.1
Mecosta	...	...	...	...	...
Menominee	...	...	...	...	...
Midland	1	0	1.00	5	5.0
Missaukee	40	15	117.50	104	0.9
Monroe	70	28	259.00	219	0.8
Montcalm	...	...	...	...	...
Montmorency	31	13	98.00	304	3.1
Muskegon	...	...	...	...	...
Newaygo	14	6	61.00	33	0.5
Oakland	2	0	6.50	3	0.5
Oceana	60	30	148.25	139	0.9
Ogemaw	...	...	...	...	...
Ontonagon	2	1	1.50	1	0.7
Osceola	17	0	71.00	178	2.5
Oscoda	89	11	440.50	428	1.0
Otsego	2	1	16.00	6	0.4
Ottawa	8	4	27.50	10	0.4
Presque Isle	64	17	212.50	118	0.6
Roscommon	913	381	2,036.50	1,763	0.9
Saginaw	...	...	...	...	...
St. Clair	3	0	11.50	4	0.3
St. Joseph	4	4	12.00	..0	0.0
Sanilac	...	...	...	...	...
Schoolcraft	88	33	204.75	280	1.4
Shiawassee	1	1	2.50	0	0.0
Tuscola	3	3	12.00	0	0.0
Van Buren	118	15	353.25	425	1.2
Washtenaw	17	8	25.75	26	1.0
Wayne	2	0	2.00	6	3.0
Wexford	148	77	311.50	237	0.8
Total	4,731	1,698	13,902.75	13,421	1.0

*36% of the fishermen caught no fish.

APPENDIX 12

Percentage of bluegill and perch catch by hatchery districts, non-trout waters

District	Total no. of bluegills and perch	Percentage of bluegills	Percentage of perch
1	799	45	55
2	4,071	10	90
3	2,937	20	80
4	6,931	43	57
5	8,439	71	29
6	890	14	86
7	5,274	74	26
8	6,423	89	11
9	9,196	92	8
10	5,150	92	8
11	11,885	59	41
Total or average	61,995	65	35

Percentage of walleye and northern pike catch by hatchery districts, non-trout waters

District	Total no. of walleye and northern pike	Percentage of walleyes	Percentage of northern pike
1	710	51	49
2	1,187	40	60
3	271	29	71
4	643	70	30
5	1,368	48	52
6	430	10	90
7	186	23	77
8	70	14	86
9	67	19	81
10	25	68	32
11	578	72	28
Total or average	5,535	46	54

APPENDIX 13
Number of each species, by counties - trout waters

County	Brook trout	Rainbow trout	Brown trout	Lm Bass	Sm Bass	Bluegill	Sunfish	Yellow perch	Walleye	Northern pike	Rock bass	Crappie	Sucker	Bullhead	Warmouth	Lake trout	Menominee whitefish	Mullet	Pilot
Alcona	311	8	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alger	801	12	1	4	53	31	...	8	2	...	...	...	....	...	4	...	...	...	...
Allegan	71	47	18	...	...	...	...	...	5	37	...	...	...	...	...	...	...	...	...
Alpena	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Antrim	228	37	41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arenac	58	16	4	...	2	...	...	...	...	7	5	...	14	...	...	...	...	...	...
Baraga	921	75	331	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...
Barry	58	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bay	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benzie	128	339	3	...	...	1	1	3	...	2	9	1	16	...	...	...	...	...	...
Berrien	7	7	11	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Branch	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Calhoun	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cass	3	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Charlevoix	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cheboygan	226	73	12	...	6	...	...	...	9	10	...	...	...	...	...	...	...	...	...
Chippewa	477	20	13	...	...	...	...	12	...	...	...	...	...	...	...	...	...	...	...
Clare	58	52	166	13	1	...	...	...	...	...	...	...	22	...	...	...	...	...	...
Clinton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Crawford	121	77	292	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delta	327	12	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dickinson	420	73	...	...	1	...	...	4	...	...	...	...	...	...	...	...	...	...	...
Eaton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Emmet	194	9	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genesee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gladwin	13	27	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gogebic	225	8	...	...	...	...	...	4	13	18	...	...	22	...	...	2	...	...	...
Grd. Traverse	68	5	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gratiot	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hillsdale	6	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Houghton	318	205	4	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...
Huron	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ingham	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ionia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iosco	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iron	647	9	2	16	82	...	...	2	1	13	23	9	...	1	...	...	...	...	...
Isabella	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jackson	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kalamazoo	73	40	40	...	...	...	...	...	...	...	...	...	15	...	...	...	...	...	...
Kalkaska	45	54	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kent	19	1	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Keweenaw	110	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lake	424	412	556	1	...	1	...	2	...	...	...	...	3	...	...	...	...	...	...
Lapeer	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leelanau	57	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lenawee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Livingston	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luce	788	19	5	...	...	...	16	21	16	4	39	...	63	...	...	...	2	...	...
Mackinac	175	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Macomb	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Manistee	418	464	22	...	...	...	...	...	...	...	...	...	8	...	...	...	...	...	...
Marquette	774	24	2	...	3	...	...	7	...	...	...	...	4	...	...	...	...	...	...
Mason	36	18	24	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...
Mecosta	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Menominee	513	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midland	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Missaukee	164	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monroe	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Montcalm	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Montmorency	242	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Muskegon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Newaygo	229	2	15	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Oakland	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oceana	5	128	29	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Ogemaw	1	5	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ontonagon	133	38	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...
Osceola	87	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oscoda	547	74	197	2	10	...	...	10	16	14	70	...	71	...	...	....	...	10	3
Otsego	397	17	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ottawa	3	...	2	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...
Presque Isle	79	2	...	...	...	...	...	2	...	2	...	...	205	160	...	...	...	...	...
Roscommon	14	2	21	...	...	...	28	36	...	1	...	...	...	...	...	...	...	...	...
Saginaw	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Clair	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Joseph	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sanilac	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	....	...
Schoolcraft	579	...	...	...	...	...	...	...	1	1	3	...	...	...	...	...	...	...	...
Shiawassee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuscola	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Van Buren	40	34	12	...	...	...	...	...	...	...	....	...	...	...	...	...	...	...	...
Washtenaw	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wayne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wexford	201	67	9	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	11,853	2,583	2,022	36	169	33	45	130	63	115	149	19	450	161	4	2	2	10	3

APPENDIX 14

Number of each species, by counties - non-trout waters

County	Lm Bass	Sm Bass	Bluegill	Sunfish	Perch	Crappie	Rock bass	Walleye	Northern pike	Bullhead	Warmouth	Carp	Dogfish	Lisco	Sucker	Brook trout	Rainbow trout	Brown trout	Lake trout	Herring	Smelt	Shiner	Gar pike	Millet	Lawyer	Sauger	Sheeps-head	Red-horse	Whitefish	Muskellunge	White Bass
Leone	21	24	119	38	154	8	7	17	104	5	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Liger	19	36	12	...	76	...	45	3	86	40	...	...	...	...	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allegan	41	2	606	30	143	35	39	13	34	10	...	244	7	3	4	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Alpena	...	24	...	...	89	...	21	3	130	529	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Antrim	34	162	366	102	1,309	470	471	7	77	7	...	...	...	47	...	2	1	...	14	...	...	...	...	...	...	...	...	...	...	1	...
Arenac	...	...	...	...	...	...	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baraga	5	31	1	...	2	...	22	5	57	1	...	...	...	...	...	...	...	...	233	...	...	...	...	...	...	1	...	...	...	...	...
Barry	36	2	1,766	37	136	129	11	2	2	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Bay	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benzie	60	86	325	136	536	...	184	42	17	2	...	...	...	...	43	...	7	8	...	...	3,051	...	...	...	...	...	...	2	1	1	...
Berrien	14	...	24	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Branch	107	11	3,708	80	227	133	4	...	16	4	60	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Calhoun	68	...	732	17	95	66	...	1	4	72	...	17	...	...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cass	57	3	219	15	101	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Charlevoix	9	51	48	26	797	4	59	1	12	1	...	...	...	...	...	...	...	...	2	174	...	...	...	...	...	...	...	...	26	...	...
Cheboygan	1	3	...	...	6	...	1	34	6	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chippewa	24	42	...	3	1,473	...	92	55	107	26	...	...	...	...	...	1	...	5	8	...	...	...	...	...	...	...	...	...	...	...	...
Clare	55	29	164	42	14	1	9	...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Clinton	...	7	213	...	3	9	...	...	10	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Crawford	1	...	166	42	17	...	70	...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delta	13	103	138	29	621	...	131	166	136	44	...	...	1	...	3	4	7	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Dickinson	4	13	...	15	29	...	...	6	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eaton	26	...	630	15	7	87	...	...	2	29	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Emmet	14	59	100	80	179	...	36	21	28	...	...	...	1	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genesee	76	11	1,487	162	78	136	49	...	30	1	...	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gladwin	27	38	236	15	102	378	94	5	42	8	...	10	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...
Gogebic	24	66	206	44	197	1	11	165	130	...	...	...	...	...	1	...	...	6	17	...	...	...	...	...	...	...	...	...	...	1	...
Grd. Traverse	45	55	529	3	145	2	102	6	28	1	...	...	1	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	2	...
Gratiot	6	19	628	3	...	...	2	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hillsdale	190	11	2,002	40	159	38	70	...	4	9	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Houghton	23	20	...	...	98	...	...	12	8	...	...	...	...	...	...	10	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...
Huron	7	265	...	2	3,123	...	56	22	2	81	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Ingham	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ionia	2	...	317	8	6	148	...	2	10	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iosco	...	...	3	...	11	...	...	1	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iron	46	72	161	11	137	15	6	136	107	...	...	...	...	...	22	1	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...
Isabella	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jackson	48	14	1,587	122	162	111	92	14	...	100	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kalamazoo	16	2	516	4	34	1	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kalkaska	45	6	236	52	46	...	7	11	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kent	105	53	3,077	122	285	68	7	8	20	6	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Keweenaw	...	...	...	...	...	...	...	...	11	...	...	...	...	...	16	...	...	...	...	...	...	...	6	...	...	...	...	1	...	...	...
Lake	79	10	589	17	127	1	3	...	...	...	...	...	...	...	...	...	...	...	23	...	...	...	...	...	...	...	...	...	...	...	...
Lapeer	53	...	1,136	49	65	23	26	...	1	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leelanau	24	252	283	74	1,417	2	722	...	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lenawee	50	10	600	73	119	4	30	...	23	127	7	26	1	33	...	...	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...
Livingston	14	13	1,362	61	22	22	4	...	1	7	...	...	2	...	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luce	...	38	87	...	501	...	70	65	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mackinac	4	8	50	20	354	...	71	159	138	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Macomb	3	14	...	...	292	...	79	1	1	2	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	...	...
Manistee	42	246	878	82	774	17	490	284	53	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	1	9	...	...	...	...
Marquette	43	63	52	9	115	84	40	13	39	...	...	...	1	463	174	2	6	...	...	21	418	...	...	...	...	...	...	...	1	2	...
Mason	...	...	322	...	44	8	...	1	64	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mecosta	...	...	...	...	3	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Menominee	...	16	...	...	12	...	...	...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midland	...	...	...	...	25	249	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Missaukee	3	34	316	260	48	...	68	1	26	16	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monroe	28	9	131	10	273	82	24	9	2	249	...	38	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Montcalm	7	...	1,288	24	370	109	4	...	10	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...
Montmorency	4	10	12	22	32	...	6	2	150	1,935	...	...	...	...	2	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muskegon	2	...	73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Newaygo	3	3	[illegible]	2	273	79	11	3	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oakland	171	24	1,[illegible]	214	144	63	163	...	56	87	...	1	24	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oceana	18	4	1,347	34	786	44	93	25	11	4	...	...	5	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2
Ogemaw	...	2	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ontonagon	1	4	...	...	10	2	...	42	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Osceola	66	39	823	236	132	8	13	14	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oscoda	12	146	766	501	200	69	356	37	166	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Otsego	2	...	...	...	1	...	3	...	...	...	...	...	...	...	34	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ottawa	13	1	104	2	61	224	4	...	6	28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Presque Isle	13	36	86	42	577	...	45	37	206	14	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	14	...	...	...
Roscommon	7	41	4,851	2,243	2,022	86	2,624	614	321	340	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20
Saginaw	...	...	...	...	52	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...
St. Clair	8	6	7	...	180	100	15	364	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
St. Joseph	...	...	49	1	25	...	16	...	...	...	15	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Sanilac	...	7	...	...	425	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Schoolcraft	5	4	82	12	469	...	18	25	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shiawassee	4	6	44	...	...	...	16	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Tuscola	28	4	349	10	96	116	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Van Buren	97	...	1,332	9	57	15	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Washtenaw	19	1	272	36	29	10	6	...	4	16	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wayne	45	7	615	26	19	16	61	19	8	247	...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wexford	9	41	429	121	969	7	79	109	16	1	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24
Total	2,147	2,386	40,309	5,468	21,656	3,286	5,776	2,561	3,029	4,112	87	497	61.1	562	424	39	24	17	321	32	3,625	2	4	6	2	4	88	10	44	9	26

APPENDIX 15

Number of each species and average size,
for each hatchery district, non-trout waters

Species	1		2		3		4		5		6		7		8	
	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size
Largemouth bass	98	13.4	112	14.1	70	12.9	229	13.2	51	13.3	24	13.4	221	12.3	135	12.9
Smallmouth bass	192	12.8	321	13.2	280	12.8	720	12.8	236	12.6	69	12.8	85	12.1	60	12.3
Bluegill	357	8.3	421	7.2	582	7.2	2,996	7.6	6,029	8.0	122	7.0	3,915	7.5	5,698	7.5
Sunfish	56	7.5	88	6.9	246	7.8	728	7.4	2,823	7.8	42	7.2	331	7.0	159	7.0
Yellow perch	442	8.3	3,650	8.2	2,355	8.3	3,935	8.2	2,410	7.4	768	8.0	1,359	7.8	725	9.5
Crappie	18	9.7	84	10.7	474	10.6	28	11.0	742	7.9	8	8.5	141	9.1	578	8.3
Rock bass	39	7.9	467	7.3	569	8.0	1,642	8.2	3,065	7.6	61	7.4	129	7.5	17	7.3
Walleye	359	17.7	472	16.7	78	17.5	453	17.1	658	16.8	43	18.5	43	18.1	10	17.3
Northern pike	351	19.1	*770	21.2	193	18.1	190	20.8	710	20.8	387	21.3	143	23.3	60	20.4
Bullhead	1	8.0	112	8.1	15	10.6	20	9.8	2,283	10.0	542	8.8	4	10.0	50	11.2
Sucker	23	15.9	6	12.7	5	19.6	224	13.8	36	16.3	...	...	3	18.7	36	14.6
Carp	...	...	...	...	...	...	...	...	10	17.6	1	28.0	...	...	...	...
Whitefish	...	....	14	13.1	28	16.4	2	23.0	...	...	...	...	...	...	...	...
Brook trout	11	8.2	10	12.3	4	8.8	10	8.0	4	12.8	...	...	...	...	...	...
Rainbow trout	...	...	7	13.3	2	18.7	13	18.6	2	19.5	...	...	...	...	...	...
Brown trout	5	14.0	3	14.6	...	...	8	7.4	...	...	...	...	...	...	...	...
Lake trout	289	17.8	5	*****	14	18.3	13	22.8	...	...	...	...	...	...	...	...
Gar pike	...	...	...	...	...	...	...	...	3	34.7	...	...	...	...	...	...
Dogfish	...	...	1	18.0	2**	24.0	3	21.0	2	20.5	...	...	8	21.3	...	...
Sheepshead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	11.0
Redhorse	...	...	...	...	...	...	2	12.00	...	...	...	...	...	...	4	17.5
Warmouth bass	...	...	...	...	...	...	****	...	...	...	...	...	...	...	...	...
Smelt	...	...	...	...	174	8.4	3,449	7.8	...	...	...	...	...	...	...	...
Cisco	...	...	6	14.7	47	12.0	496	11.5	...	...	...	...	...	...	...	...
Herring	...	...	8	8.0	2	12.0	21	12.0	...	...	...	...	1	15.0	...	...
Muskellunge	1	34.0	...	...	1	34.5	5	37.0	...	...	...	...	...	...	...	...
Sauger	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mullet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	13.0
Shiner	...	...	...	...	...	...	...	...	2	7.0	...	...	...	...	...	...
Lawyer	2	30.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
White bass	...	...	1	14.3	...	...	...	...	...	...	...	...	2	10.0	20	11.0
Total	2,243	13.5	6,558	10.5	5,141	9.3	15,187	9.1	19,066	8.9	2,067	11.1	6,385	8.3	7,572	8.1

* -no size given for 55 fish
** -no size given for 1 fish
*** -no size given for 3 fish
**** -no size given for 2,664 fish
***** -no size given

	8		9		10		11		Total	
	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size	No.	Ave. size
3	135	12.9	532	12.5	171	12.8	504	12.8	2,147	12.8
1	60	12.3	29	12.2	16	10.9	377	13.7	2,385	12.9
5	5,698	7.5	8,450	7.4	4,730	7.3	7,009	7.3	40,309	7.5
0	159	7.0	179	6.8	192	6.4	625	6.8	5,468	7.4
8	725	9.5	746	7.9	420	7.4	4,876	8.1	21,686	8.1
1	578	8.3	229	8.8	412	8.3	572	8.3	3,286	8.7
5	17	7.3	156	7.6	103	6.8	528	7.5	6,776	7.7
1	10	17.3	13	17.5	17	15.6	415	16.0	2,561	16.9
3	60	20.4	54	20.1	8	22.1	**165	21.4	3,029*	20.7
0	50	11.2	27	10.0	205	8.9	853	8.1	4,112**	9.3
7	36	14.6	4	9.0	51	14.1	36	12.6	424	14.1
•	...	...	247***	11.7	17	12.2	222	11.8	497***	11.9
•	...	...	...	...	...	...	...	...	44	15.6
•	...	...	...	...	...	...	...	...	39	9.7
•	...	...	...	...	...	...	...	...	24	17.1
•	...	...	1	20.5	...	...	...	...	17	11.4
•	...	...	. .	...	...	...	...	...	321	18.0
•	...	...	...	...	...	...	1	17.0	4	30.2
3	...	...	9	16.1	7	18.7	29	18.6	61**	18.5
•	14	11.0	...	...	...	...	54	12.4	68	12.1
•	4	17.5	1	15.0	...	...	3	16.7	10	15.9
•	...	...	79	6.2	1	6.5	7	6.7	87	6.3
•	...	...	...	...	...	...	...	...	3,623****	7.9
•	...	...	3	13.0	...	...	...	...	552	11.6
0	...	...	...	...	...	...	...	...	32	11.1
•	...	...	...	...	1	36.0	1	31.0	9	35.6
•	...	...	...	...	...	...	4	10.7	4**	10.7
•	6	13.0	...	...	...	...	...	...	6	13.0
•	...	...	...	...	...	...	...	...	2	7.0
•	...	...	...	...	...	...	...	...	2	30.0
0	20	11.0	...	...	...	...	2	14.00	25	11.3
3	7,572	8.1	10,759	7.9	6,351	7.7	16,281	8.4	97,610	8.6

INSTITUTE FOR FISHERIES RESEARCH

By O. H. Clark

Typed by: Alma Hartrick
Approved by: A. S. Hazzard