

cc: Education-Game  
Mr. Frank Banks  
Dr. John Van Costen  
Mr. Krumholz

Mr. Carbine  
Institute for Fish. Res.

February 9, 1945

REPORT NO. 997

RESULTS OF THE COOPERATIVE CREEL CENSUS ON THE  
CONNECTING WATERS BETWEEN LAKE HURON AND LAKE ERIE, 1943

by

Louis A. Krumholz and W. F. Carbine

X The organization of the cooperative creel census on the connecting waters between Lake Huron and Lake Erie and the information secured during the first summer of operation (1942) are given in Institute Reports No. 794<sup>1</sup> and 879<sup>2</sup> respectively. Operators of boat liveries between Port Huron and Wyandotte were interviewed on May 27-29, 1943, and requested to cooperate with the Department of Conservation in obtaining creel census data. Blanks, the same as those used during 1942, were provided and the livery operators were asked to secure similar information as during the previous summer.

X In this report, as in the report for 1942, the connecting waters on the American side between Lake Huron and Lake Erie have been arbitrarily divided into four parts: (1) the St. Clair River: the waters between the Bluewater Bridge at Port Huron and the north end of Russell Island near Algonac; (2) the St. Clair River Flats: the waters of the North, Middle, and South, and all connecting channels between the north end of Russell Island

---

<sup>1</sup> The Organization of the Creel Census on Lake St. Clair, the St. Clair and Detroit Rivers. Institute Report No. 794, by W. F. Carbine.

<sup>2</sup> The Results of the Cooperative Creel Census on the Connecting Waters Between Lake Huron and Lake Erie in 1942. Institute Report No. 879, by Louis A. Krumholz and W. F. Carbine.

and Lake St. Clair and including the waters of Big Muscamoot, Little Muscamoot, Goose, Fisher, and Pollett Bays; (3) Lake St. Clair: those waters between the St. Clair Flats, as mentioned above, and the north end of Peche Island; and (4) the Detroit River: the waters from the north end of Peche Island to the foot of Oak Street in Wyandotte.

These four divisions furnish a variety of different kinds of fishing. On the St. Clair River most of the fishing is done by special trolling methods for yellow pikeperch and very few fish of other species are taken. The St. Clair River Flats afford a greater variety of fishing than does the St. Clair River and, although large numbers of pikeperch are taken, considerable numbers of yellow perch, smallmouth black bass, northern pike and muskellunge enter into the catch. In Lake St. Clair, which offers the greatest variety of fishing in the connecting waters, the perch is by far the most abundant species in the anglers' creels. In addition, there is excellent smallmouth bass fishing and Lake St. Clair is considered by many to be the finest muskellunge grounds in the United States. The Detroit River affords good fishing for pikeperch, smallmouth bass, saugers, and sheephead.

In 1942, 78 out of 86 liveries were open and 71 expressed willingness to cooperate. This interest gradually waned during the summer and by the end of the season the number of reports filled out indicated that only 17 liveries had given good cooperation. During 1943, there were only 48 liveries which operated full time and six which were open only on weekends. Of these 54 liveries, only 19 secured creel census data and by the end of the season (arbitrarily set at September 27) only 10 could be considered as having given good cooperation. The cooperating liveries and the degree to which each cooperated are as follows:

St. Clair River:

George Rose - 2611 River Road, St. Clair. Open full time; very good cooperation.

Stewart Cunningham - 3404 River Road, St. Clair. Open full time; poor cooperation.

T. A. Parker - 1349 N. River Road, St. Clair. Open full time; good cooperation.

Lyman's Boat Livery - 5003 N. River Road, St. Clair. Open full time; very good cooperation.

Sonny's Boat Livery - 6005 N. River Road, Marine City. Open full time; poor cooperation.

George Argitis - So. Parker Street, Marine City. Open full time; fair cooperation.

Adam Otrompke - 6551 St. Clair River Drive. Open full time; very good cooperation.

North Algonac Boat Livery - 2218 St. Clair River Drive, Algonac. Open full time; good cooperation.

George Douglas - Algonac. Open full time; fair cooperation.

St. Clair Flats:

Lemire's Boat Livery - 6169 South River Drive, Pearl Beach, Algonac. Open only on weekends; good cooperation.

Lake St. Clair:

Bud's Boat Livery - 8287 Dixie Highway, Fair Haven. Open full time; fair cooperation.

Tip's Boat Livery - 8423 Dixie Highway, Fair Haven. Open full time; fair cooperation.

Mar-chuk Boat Livery - Chas. Easterly, 8835 Dixie Highway, Fair Haven. Open full time; good cooperation.

Anchorville Boat Livery - M. C. Joswick, 9691 Dixie Highway, Anchorville.

Open part time; good cooperation.

Chester Bowers, Courtesy Boats - 10329 Bowers Court, Anchorville.

Open full time; fair cooperation.

Romick Boat Livery - 6465 N. River Road, Mt. Clemens. Open full time;

fair cooperation.

Barney's Boat Livery - Thomas Barney, 6881 S. River Road, Mt. Clemens.

Open full time; very good cooperation.

Lakeside Boathouse - R. F. D. #6, Mt. Clemens. Open full time; fair

cooperation.

Detroit River:

Spade's Boat Livery - 4633 W. Jefferson, Ecorse. Open full time;

very good cooperation.

We gratefully acknowledge the assistance of these livery operators in securing creel census data. Several boat liveries in addition to these were willing to cooperate but, because of a critical shortage of help, were unable to do so.

In figuring the degree of cooperation given by the various liveries several factors were taken into consideration. In all cases the attitude of the livery operator toward the census and the manner in which the catches were recorded aided in determining the degree of cooperation offered. If the livery filled out blanks properly for most of the days on which it was open for business, the cooperation was considered as good or very good depending on the number of records submitted. Those liveries which kept records only when it was convenient or to their liking were considered as fair or poor.

As previously mentioned, there were considerably fewer liveries operating on the connecting waters in 1943 than there were in 1942. During 1942 there were 78 liveries which offered 1,416 boats for rent whereas in 1943

there were only 54 liveries (6 of these were open only on weekends) which made 1,119 boats (122 boats owned by the 6 part-time liveries) available to the public (Table 1). When the liveries were contacted in 1942 it was

Table 1

Numbers of liveries operating on the connecting waters between Lake Huron and Lake Erie and the numbers of boats thus made available to the public in 1941, 1942, and 1943. The number of boats available in 1941 is not known. The figures in parentheses indicate the number of liveries and boats operated on a part-time basis.

	1941	1942	1943
<b>St. Clair River</b>			
Number of liveries	33	29	16 (2)
Number of boats	...	516	352 (45)
<b>St. Clair River Flats</b>			
Number of liveries	4	4	4 (1)
Number of boats	...	98	98 (15)
<b>Lake St. Clair</b>			
Number of liveries	39	36	29 (3)
Number of boats	...	632	455* (62)
<b>Detroit River</b>			
Number of liveries	10	9	5
Number of boats	...	170	114*
<b>Totals</b>			
Number of liveries	86	78	54 (6)
Number of boats	...	1,416	1,119** (122)

\* No record of the number of boats owned by one livery.

\*\* No record of the number of boats owned by two liveries.

found that there had been 86 liveries operating full time in 1941 and that 8 of these had closed because of Coast Guard regulations or other factors which made operation more difficult than in peacetime. The number of

boats owned by the 8 liveries which closed between 1941 and 1942 is not known. Thus there was a drop of 9.3 per cent in the number of liveries operating on the connecting waters between 1941 and 1942 and a further drop of 30.8 per cent between 1942 and 1943. The decrease in the number of livery boats available to the public was 21.0 per cent between 1942 and 1943. The difference in the percentage decrease in boats and liveries between 1942 and 1943 was due primarily to two things: (1) most of the operators who closed during this period owned small liveries and (2) some of the liveries which were open in 1943 had purchased additional boats from some of the liveries that closed.

At the close of the 1943 season a form letter was sent out to 20 liveries inquiring as to the number of boats rented by each livery in 1942 and in 1943. These liveries were selected from the list of 48 liveries which operated full time in 1943 and were intended to be representative of each of the four divisions of the connecting waters. Only 8 of the liveries replied to the letter and the information thus gathered is given in Table 2. None of the liveries on the Detroit River answered the form letter.

Table 2

Numbers of boats rented by livery operators on the connecting waters between Lake Huron and Lake Erie in 1942 and in 1943. These records were submitted in answer to a questionnaire

Name and location of operator	Number of boats rented	
	1942	1943
George Rose, St. Clair River	391	488
Peter Heuser, St. Clair River	430	710
Total	821	1,198
Harvey Weil, St. Clair River Flats	1,483	1,352
Herman Whitford, Lake St. Clair	400	450
M. C. Joswick, Lake St. Clair	103	162
Albert Gason, Lake St. Clair	1,777	1,526
Thomas Barney, Lake St. Clair	1,684	1,416
Charles L. Wood	1,502	1,840
Total	5,466	5,374
GRAND TOTAL	7,770	7,924

From the data in Table 2 it is evident that the two liveries on the St. Clair River rented more boats in 1943 than during the preceding year. This is probably due to the very marked decrease (44.8 per cent) in the number of boat liveries open on this area from 1942 to 1943. If fewer liveries are open it is assumed that those which remain open will be patronized more heavily to handle the business formerly taken care of by the liveries which closed. In the other two areas, from which returns to the questionnaire were received, there was a slight decrease (8.8 per cent in the St. Clair River Flats and 0.2 per cent in Lake St. Clair) in the numbers of boats rented by the liveries. These decreases might have been due to the general decrease in the number of anglers who fished the area as indicated later on in this report.

The creel census data collected by the liverymen during 1943 were checked against and augmented by the general creel census records for the connecting waters that were taken by the conservation officers as part of their regular duties. In addition, Mr. Corbine worked with these officers

for one or two days at approximately 10-day intervals between May 27 and September 27. These trips were rotated between the St. Clair River, the St. Clair River Flats, Lake St. Clair, and the Detroit River so that intensive creel census data could be secured from anglers on all parts of the connecting waters several times during the season. We wish to acknowledge the cooperation of District Supervisor E. E. Tucker and Conservation Officers Harold Kransi, James Lee, Earl Goff, Isaac Peabody, and Fred A. Eckhout of the Division of Field Administration. On some trips two or three of the divisions were visited on the same day. The number of times each one was visited are as follows: St. Clair River - 7; St. Clair River Flats - 5; Lake St. Clair - 6; Detroit River - 3.

#### NUMBER OF RECORDS

During the period of operation of the intensified creel census on the connecting waters between Lake Huron and Lake Erie (May 27-September 27, 1943) data were secured on the angling of 10,036 fishermen who fished a total of 61,120.25 hours and caught 34,850 legal fish at a rate of 0.57 fish per hour (Table 3). These fish weighed a total of 28,540.6 pounds, an average yield of 0.47 pound of fish per hour of angling. These data for 1943 represent considerably fewer fishermen (21.9 per cent) and a lower catch per hour (0.11 fish) than did similar data collected during 1942 (Table 4). However, the pounds of fish caught per hour was much higher (by 0.15 pound) in 1943 than in 1942. The period covered by the 1943 census was 144 days shorter (26.3 per cent) than that covered by the census in 1942. This shorter "season" probably accounts for the smaller number of anglers in 1943 but should not have had any effect on the quality of fishing as reflected in the decreased catch per hour during the latter year.

Table 3

Combined creel census data taken by boat livery operators, conservation officers, and members of the Institute staff for the connecting waters between Lake Huron and Lake Erie

May 27-September 27, 1943

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	5,201	2,405	2.2	34,898.00	6.71	16,640	0.48	23,053.7	0.66
St. Clair Flats	418	183	2.3	1,355.50	3.24	575	0.42	549.5	0.41
Lake St. Clair	3,952	1,560	2.5	22,833.25	5.78	16,953	0.74	4,089.9	0.18
Detroit River	465	235	2.0	2,033.50	4.37	682	0.34	847.5	0.42
Total or Average	10,036	4,383	2.3	61,120.25	6.1	34,850	0.57	28,540.6	0.47

Table 4

Combined creel census data taken by boat livery operators, conservation officers, and members of the Institute staff, for the connecting waters between Lake Huron and Lake Erie,

May 17-November 1, 1942

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	3,577	1,622	2.2	24,074.75	6.73	8,648	0.36	12,611	0.52
St. Clair Flats	1,707	640	2.7	7,289.00	4.27	3,657	0.50	1,781	0.24
Lake St. Clair	6,744	2,934	2.3	39,298.50	5.83	36,828	0.94	7,949	0.20
Detroit River	816	415	2.0	3,913.75	4.80	1,736	0.44	1,844	0.47
Total or Average	12,844	5,611	2.3	74,576.00	5.81	50,879	0.68	24,185	0.32

Of the 10,039 fisherman-days recorded in the 1943 census, 8,007 records (79.8 per cent) were submitted by the livery operators (Table 5) whereas in 1942, liverymen took a total of 9,430 records (73.2 per cent) as shown in Table 6. The number of records from the liveries on the St. Clair River was much higher in 1943 than during the previous year, whereas in each of the other three divisions, the number of records was considerably lower. The obvious reason for this shift in the number of records sent in by livery operators was that the operators on the St. Clair River were, in general, more cooperative in 1943 than in 1942, and that three liveries on Lake St. Clair, one livery on the Flats and one livery on the Detroit River, which had given good cooperation in 1942, were closed during the following season or were unable to keep records because of an inability to secure help.

The remaining 2,029 records (20.2 per cent) of the total number secured during 1943 were taken by the conservation officers and members of the Institute staff (Table 7), whereas in 1942 these men recorded 3,414 fisherman-days (26.8 per cent) as indicated in Table 8. The decrease in the number of records secured by the officers and staff members during the second year of the census may be directly attributed to the fact that in 1942 two staff members worked with the officers whereas in 1943 only one was available. In 1943, the separate divisions of the connecting waters were visited a total of 21 times by Mr. Carbine, whereas in 1942 both writers made a total of 33 such visits.

As in 1942, the sample of creel census records taken by the conservation officers and staff members of the Institute during 1943 was, in all probability, not as representative of the fishing as that collected by the boat liverymen.

Table 5

Creel census data taken by boat livery operators for the  
connecting waters between Lake Huron and Lake Erie,  
May 27-September 27, 1943

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	4,480	2,055	2.2	33,039.25	7.37	15,361	0.46	21,078.6	0.64
St. Clair Flats	71	31	2.3	606.00	8.54	179	0.30	227.3	0.38
Lake St. Clair	3,126	1,261	2.5	20,175.25	6.31	13,896	0.69	3,208.4	0.16
Detroit River	260	128	2.0	1,506.50	5.79	464	0.31	600.4	0.40
Total or Average	8,007	3,475	2.3	55,327.00	6.91	29,900	0.54	25,114.7	0.45

Table 6

Creel census data taken by boat livery operators for the  
connecting waters between Lake Huron and Lake Erie,  
May 17-November 1, 1942

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	2,802	1,262	2.2	21,153.00	7.55	7,642	0.36	11,457	0.54
St. Clair Flats	481	218	2.2	3,505.50	7.29	1,458	0.42	1,020	0.29
Lake St. Clair	5,710	2,519	2.3	34,191.00	5.99	33,125	0.97	6,184	0.18
Detroit River	437	251	1.7	2,818.50	6.45	1,312	0.46	1,579	0.56
Total or average	9,430	4,270	2.2	61,688.00	6.54	43,537	0.71	20,240	0.33

Table 7

Creel census data taken by conservation officers and members of the Institute staff for  
the connecting waters between Lake Huron and Lake Erie,

May 27-September 27, 1943

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	721	350	2.1	1,858.75	2.58	1,279	0.69	1,975.1	1.06
St. Clair Flats	347	152	2.3	749.50	2.16	396	0.53	322.2	0.63
Lake St. Clair	755	299	2.5	2,650.00	3.52	3,057	1.15	881.5	0.33
Detroit River	205	107	1.9	527.00	2.57	218	0.41	247.1	0.47
Total or Average	2,029	908	2.2	5,793.25	2.86	4,950	0.85	3,425.9	0.59

Table 8

Creel census data taken by conservation officers and members of the Institute staff for  
the connecting waters between Lake Huron and Lake Erie,

May 17-November 1, 1942

Area	Number of anglers	Number of boats	Anglers per boat	Total hours spent fishing	Hours per fisherman-day	Total legal fish taken	Catch per hour (number)	Pounds of legal fish taken	Catch per hour (pounds)
St. Clair River	775	340	2.3	2,921.75	3.77	1,006	0.34	1,154	0.39
St. Clair Flats	1,226	422	2.9	3,783.50	3.09	2,199	0.58	761	0.20
Lake St. Clair	1,034	415	2.5	5,107.50	4.94	3,713	0.73	1,765	0.35
Detroit River	379	164	2.3	1,095.25	2.89	424	0.39	265	0.24
Total or Average	3,414	1,341	2.5	12,908.00	3.78	7,342	0.56	3,945	0.31

QUALITY OF FISHING IN THE DIFFERENT DIVISIONS  
OF THE CONNECTING WATERS

As has been previously mentioned, there is considerable variation in the kinds of fish taken and the types of fishing afforded the angler in each of the four divisions of the connecting waters between Lake Huron and Lake Erie. The best means of indicating the quality of fishing is the unit catch per hour. The unit may be expressed either as the number or weight of fish. The catch in numbers and pounds of fish per hour for each of the four divisions of the connecting waters for 1942 and 1943 is shown in Tables 3 to 8. The number of fish caught per hour depends, to a great extent, on the type of fishing being done; still-fishing with natural bait generally being much more productive than casting or trolling. The pounds of fish taken per hour is also dependent on the type of fishing, and in the connecting waters, where still-fishing produces greater numbers of fish, specialized trolling methods for yellow pikeperch, as described in Institute Report No. 879, produce a greater poundage of fish. This is borne out by the data from both years of the census under discussion. During each year the catch in numbers of fish per hour was higher in Lake St. Clair, where most of the fish caught were perch, than in the St. Clair River where the pikeperch makes up the majority of the catch. Conversely, the catch in pounds of fish per hour was greater in the St. Clair River than in Lake St. Clair because although fewer fish were caught in the river they were much larger than those taken from the lake.

The number of fish caught per hour in the St. Clair River was higher in 1943 than in 1942 whereas in the other three divisions this catch per hour was lower during the second year of the census. The pounds of fish caught per hour was considerably higher in the St. Clair River and St. Clair River Flats in 1943 than during the preceding year whereas in

the other two divisions it remained about the same each year. The increase in the pounds of fish caught per hour in the St. Clair River may be explained by the fact that an increase in the number of fish caught per hour automatically causes an increase in the pounds of fish caught per hour providing the average weight of the fish caught is greater than unity. The average weight of pikeperch taken from the St. Clair River, as estimated from the total lengths, was 1.4 pounds. The increase in the catch in pounds per hour in the St. Clair River Flats is explained by the relatively great increase in the numbers of yellow pikeperch taken.

The catch per hour as reflected by the data secured from the boat liveries shows the same variations for the two years of the census as that for all data combined.

In the data secured by the conservation officers and members of the Institute staff, the differences in the catch per hour for each of the four divisions during the two years of the census are greater than those recorded by the livery operators. The number of fish caught per hour was higher on the St. Clair River and Lake St. Clair in 1943 than in 1942 and was about the same in the other two divisions. The much greater catch per hour in numbers for Lake St. Clair as shown by the officers' census does not correspond with the decrease indicated by the data from the livery operators. Also the data of the livery operators showed an increase in the catch per hour on the St. Clair River Flats whereas there was a decrease in this figure as recorded by the officers. Such differences might have been due to: (1) the possibility that each time the officers checked the fishing on these waters the anglers had been more successful than usual, or (2) the numbers of private boats which were checked by the officers and not by the livery operators.

Further indication that still-fishing as done in Lake St. Clair produces smaller fish than the specialized trolling methods in the St. Clair River is given in Table 9. The number of fish taken from these two areas

Table 9

Numbers and total weights of fish taken from each of the four areas of the connecting waters between Lake Huron and Lake Erie, May 27-September 27, 1943. The data obtained from the boat liveries and by the conservation officers and staff members are combined.

Area	Number of fish	Percentage of total	Weight of fish (pounds)	Percentage of total
St. Clair River	16,640	47.7	23,053.7	80.8
St. Clair Flats	575	1.6	549.5	1.9
Lake St. Clair	16,953	48.6	4,089.9	14.3
Detroit River	682	2.0	847.5	3.0
Total	34,850	99.9	28,540.6	100.0

as recorded in the combined 1943 data shows that, whereas the numbers of fish from each division were approximately equal, the weight of the fish from the St. Clair River was more than five times as great as that from Lake St. Clair. Also, the average fish taken from the St. Clair Flats and Detroit River was larger than that from Lake St. Clair.

#### COMPOSITION OF THE TOTAL CATCH

The numbers, average lengths, and percentages of the total numbers and weights of all fish taken from each of the four divisions of the connecting waters between Lake Huron and Lake Erie, and the combined total for all divisions are given in Table 10.

Table 10

Percentage composition of the total catch by numbers and weights as reported by boat livery operators, conservation officers and members of the Institute staff, for each area, all data combined, May 27-September 27, 1943.

Species	Number of fish	Average length	Percentage composition (numbers)	Total weight (pounds)	Percentage composition (weight)
<u>St. Clair River</u>					
Yellow pikeperch	16,231	16.4	97.5	22,556.2	97.8
Smallmouth bass	160	14.5	1.0	239.3	1.0
Yellow perch	24	6.9	0.1	33.2	tr
Rock bass	125	9.9	0.8	91.9	0.4
Northern pike	31	22.0	0.2	71.7	0.3
Muskellunge	...	...	...	...	...
White bass	6	8.7	tr	2.4	tr
Largemouth bass	...	...	...	...	...
Crappie	...	...	...	...	...
Channel catfish	9	18.6	0.1	25.0	0.1
Sauger	5	13.4	tr	4.1	tr
Common sucker	17	15.2	0.1	19.2	0.1
Bullheads	2	8.0	tr	0.4	tr
Sheepshead	8	15.3	0.1	12.0	0.1
Carp	...	...	...	...	...
Mooneye	...	...	...	...	...
Redhorse	22	16.1	0.1	28.3	0.1
Bluegill	...	...	...	...	...
Pumpkinseed	...	...	...	...	...
Dogfish	...	...	...	...	...
Total or average	16,640	...	100.0	23,053.7	99.9
<u>St. Clair Flats</u>					
Yellow pikeperch	304	16.5	52.9	438.9	79.9
Smallmouth bass	21	14.9	3.7	35.2	6.4
Yellow perch	212	7.5	36.9	36.2	6.7
Rock bass	9	9.3	1.6	5.6	1.0
Northern pike	19	18.8	3.3	26.1	4.7
Muskellunge	...	...	...	...	...
White bass	4	11.0	0.7	2.3	0.4
Largemouth bass	...	...	...	...	...
Crappie	...	...	...	...	...
Channel catfish	...	...	...	...	...
Sauger	1	13.0	0.2	0.8	0.1
Common sucker	2	16.0	0.3	2.4	0.4
Bullheads	...	...	...	...	...
Sheepshead	...	...	...	...	...
Carp	...	...	...	...	...
Mooneye	2	13.0	0.3	1.0	0.2
Redhorse	1	14.0	0.2	1.0	0.2
Bluegill	...	...	...	...	...
Pumpkinseed	...	...	...	...	...
Dogfish	...	...	...	...	...
Total or average	575	...	100.1	549.5	100.0

Table 10 (continued)

Species	Number of fish	Average length	Percentage composition (numbers)	Total weight (pounds)	Percentage composition (weight)
<u>Lake St. Clair</u>					
Yellow pikeperch	242	16.1	1.4	321.6	7.9
Smallmouth bass	826	11.9	4.9	691.2	16.9
Yellow perch	13,717	7.2	80.9	2,063.3	50.4
Rock bass	1,527	7.7	9.0	530.6	13.0
Northern pike	71	18.7	0.4	95.3	2.3
Muskellunge	7	36.6	tr	80.5	2.0
White bass	6	11.7	tr	4.2	0.1
Largemouth bass	33	10.9	0.2	20.0	0.5
Crappie	119	8.5	0.7	54.6	1.3
Channel catfish	54	10.8	0.3	38.2	0.9
Sauger	...	...	...	...	...
Common sucker	9	17.2	0.1	16.0	0.4
Bullheads	29	12.0	0.2	28.8	0.7
Sheepshead	58	14.5	0.3	81.9	2.0
Carp	2	14.0	tr	5.0	0.1
Mooneye	...	...	...	...	...
Redhorse	1	18.0	tr	1.5	tr
Bluegill	234	6.8	1.4	50.0	1.2
Pumpkinseed	17	7.5	0.1	6.0	0.1
Dogfish	1	14.0	tr	1.2	tr
<b>Total or average</b>	<b>16,953</b>	<b>....</b>	<b>99.9</b>	<b>4,089.9</b>	<b>99.8</b>
<u>Detroit River</u>					
Yellow pikeperch	542	16.2	79.5	741.9	87.5
Smallmouth bass	7	12.9	1.0	7.8	0.9
Yellow perch	49	7.6	7.2	8.5	1.0
Rock bass	20	8.0	2.9	7.7	0.9
Northern pike	4	19.0	0.6	7.2	0.8
Muskellunge	...	...	...	...	...
White bass	20	13.8	2.9	14.5	1.7
Largemouth bass	...	...	...	...	...
Crappie	...	...	...	...	...
Channel catfish	...	...	...	...	...
Sauger	2	13.5	0.3	1.6	0.2
Common sucker	1	10.0	0.1	0.6	0.1
Bullheads	...	...	...	...	...
Sheepshead	33	14.5	4.8	49.0	5.8
Carp	1	18.0	0.1	5.0	0.6
Mooneye	...	...	...	...	...
Redhorse	2	17.5	0.3	3.5	0.4
Bluegill	...	...	...	...	...
Pumpkinseed	1	6.0	0.1	0.2	tr
Dogfish	...	...	...	...	...
<b>Total or average</b>	<b>682</b>	<b>...</b>	<b>99.8</b>	<b>847.5</b>	<b>99.9</b>

Table 10 (continued)

Species	Number of fish	Average length	Percentage composition (numbers)	Total weight (pounds)	Percentage composition (weight)
<u>All waters combined</u>					
Yellow pikeperch	17,319	16.4	49.7	24,058.6	84.6
Smallmouth bass	1,014	12.4	2.9	973.5	3.4
Yellow perch	14,002	7.2	40.2	2,111.2	7.4
Rock bass	1,681	7.9	4.8	635.8	2.2
Northern pike	125	19.5	0.4	200.3	0.7
Muskellunge	7	36.6	tr	80.5	0.3
White bass	36	12.3	0.1	23.4	0.1
Largemouth bass	33	10.9	0.1	20.0	0.1
Crappie	119	8.5	0.3	54.6	0.2
Channel catfish	63	11.9	0.2	63.2	0.2
Sauger	8	13.4	tr	6.5	tr
Common sucker	29	15.7	0.1	38.2	0.1
Bullheads	31	11.7	0.1	29.2	0.1
Sheepshead	99	14.6	0.3	142.9	0.5
Carp	3	15.3	tr	10.0	tr
Mooneye	2	13.0	tr	1.0	tr
Redhorse	26	16.2	0.1	34.3	0.1
Bluegill	234	6.8	0.7	50.0	0.2
Pumpkinseed	18	7.4	0.1	6.2	tr
Dogfish	1	14.0	tr	1.2	tr
Total or average	34,850	...	100.1	28,540.6	100.2

In 1942, yellow perch made up 68.8 per cent of the total number of fish taken from all waters combined and was followed in order by yellow pikeperch (19.4 per cent), rock bass (5.9 per cent), and smallmouth bass (2.9 per cent). The remaining 3.0 per cent included seventeen species of which no single species made up as much as 0.5 per cent. During 1943, the four above-mentioned species made up 97.6 per cent of the total catch as follows: yellow pikeperch, 49.7 per cent; yellow perch, 40.2 per cent; rock bass 4.8 per cent; and smallmouth bass 2.9 per cent. The remaining 2.4 per cent in 1943 consisted of 16 species each of which contributed less than 0.5 per cent. The greatest change in numbers of fish taken during the two years was that exhibited in the catches of perch and pikeperch. The percentage of perch taken dropped from 68.8 per cent in 1942 to 40.2 per cent in 1943. In 1942 pikeperch made up only 19.4 per cent of the total number of fish taken whereas during the second summer of the census 49.7 per cent of all fish taken were "pickereL" This change was probably due to the smaller number of records from Lake St. Clair and the increased catch per hour on the St. Clair River during 1943. The number of pikeperch recorded in 1943 (16,231 fish) from the St. Clair River was almost twice that of the preceding year (8,555 fish). The number of perch recorded from Lake St. Clair dropped from 31,948 in 1942 to 13,717 in 1943.

In the St. Clair Flats the number of pikeperch increased from 280 in 1942 to 304 in 1943 and the number of perch recorded dropped from 2,427 in 1942 to 212 in 1943. The percentage of pikeperch in the total catch from the St. Clair Flats increased from 7.7 per cent in 1942 to 52.9 per cent in 1943 and there was a decrease in the number of perch from 66.4 per cent in 1942 to 36.9 per cent the following year.

The percentage composition of the total catch from the Detroit River also showed an increase in the percentage of pikeperch from 44.6 per cent in 1942 to 79.5 per cent in 1943, whereas during the same period there was a decrease in the percentage of perch recorded from 34.6 per cent to 7.2 per cent.

In the percentage composition of the total weight of the fish caught from all waters, the order in which the four most important species contributed to the total was the same in both years as follows: 1942 - yellow pikeperch, 59.1 per cent; yellow perch, 22.2 per cent; smallmouth bass, 5.7 per cent; and rock bass, 4.5 per cent; 1943 - yellow pikeperch, 84.6 per cent; yellow perch, 7.4 per cent; smallmouth bass, 3.4 per cent; and rock bass, 2.2 per cent. Obviously the great increase in the numbers of pikeperch recorded in the census during the second year caused a corresponding increase in the percentage of total weight contributed by this species and the increase in number and weight occurred primarily at the expense of the perch.

In the 1942 census, 14 species were represented in the records from the St. Clair River and only 12 species were recorded during 1943. Three species, largemouth bass, rainbow trout, and mooneye, were recorded in 1942 and not in 1943 whereas no northern pike were recorded during 1942 but were recorded the following summer. Thirteen species were listed from the St. Clair Flats in 1942 but the following year only 10 species were recorded in the anglers' catches. Four species present in 1942, muskellunge, sheepshead, carp, and pumpkinseed, were not recorded in 1943 and common suckers which were not listed in 1942 were taken the following year. The anglers interviewed on Lake St. Clair caught a total of 19 species in 1942 and 18 species in 1943. Two kinds of fish, sauger and shortnosed gar, were taken during 1942 and not in 1943, whereas the only kind recorded during 1943 which was not taken the previous year was the dogfish. In 1942,

15 kinds of fish were listed from the Detroit River whereas in 1943 only 12 kinds were recorded. Muskellunge, crappies, mooneyes, and bluegills were present in the catch of 1942 and not the following year, and carp, which were recorded in 1943, were not taken the first year of the census.

#### RESIDENCE OF ANGLERS

Table 11 shows the residence by numbers and percentage of all anglers interviewed in each of the four divisions of the connecting waters by the livery operators, conservation officers and members of the Institute staff and the total of these two censuses combined between May 27 and September 27, 1943. It is significant that 8,334 (83.0 per cent) of the 10,036 anglers whose catches were recorded were residents of Wayne County. Residents of the other two counties bordering the connecting waters, St. Clair and Macomb, numbered only 1,425 or 14.2 per cent of the total. Thus it is evident that "local" fishermen made up 97.2 per cent of all anglers on the connecting waters as indicated by the creel census. In addition to these local anglers, fishermen from seven other Michigan counties, Oakland, Genesee, Calhoun, Sanilac, Clinton, Monroe, and Van Buren, two states, Ohio and Indiana, and the Dominion of Canada were represented in the data. The creel census data for 1942 indicated that 98.8 per cent of all anglers interviewed lived in one of the three counties bordering on the connecting waters.

Table 11

Total of all anglers interviewed on the connecting waters between Lake Huron and Lake Erie, May 27 - September 27, 1943, by boat livery operators, conservation officers and members of the Institute staff, and all data combined.

Area	Wayne		Macomb		St. Clair		Oakland		Genesee		Calhoun		Sanilac	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>BOAT LIVERIES:</b>														
St. Clair River	3,839	85.7	271	6.0	213	4.8	136	3.0	6	0.1	6	0.1	1	tr
St. Clair Flats	71	100.0	...	...	...	...	...	...	...	...	...	...	...	...
Lake St. Clair	2,684	84.0	399	12.5	27	0.8	86	2.7	...	...	...	...	...	...
Detroit River	258	99.2	...	...	...	...	...	...	...	...	...	...	...	...
Total or Average	6,852	85.6	670	8.4	240	3.0	222	2.8	6	0.1	6	0.1	1	tr
<b>OFFICERS AND STAFF:</b>														
St. Clair River	572	79.3	49	6.8	81	11.2	11	1.5	...	...	...	...	...	...
St. Clair Flats	249	71.8	11	3.2	83	23.9	2	0.6	...	...	...	...	...	...
Lake St. Clair	456	60.3	225	29.8	66	8.7	8	1.1	...	...	...	...	...	...
Detroit River	205	100.0	...	...	...	...	...	...	...	...	...	...	...	...
Total or Average	1,482	73.0	285	14.0	230	11.3	21	1.0	...	...	...	...	...	...
<b>TOTAL:</b>														
St. Clair River	4,411	84.8	320	6.2	294	5.7	147	2.8	6	0.1	6	0.1	1	tr
St. Clair Flats	320	76.6	11	2.6	83	19.9	2	0.5	...	...	...	...	...	...
Lake St. Clair	3,140	79.5	624	15.8	93	2.4	94	2.4	...	...	...	...	...	...
Detroit River	463	99.6	...	...	...	...	...	...	...	...	...	...	...	...
Total or Average	8,334	83.0	955	9.5	470	4.7	243	2.4	6	0.1	6	0.1	1	tr

Table 1] (continued)

Area	Clinton		Monroe		Van Buren		Ohio		Indiana		Canada		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
BOAT LIVERIES:														
St. Clair River	1	tr	1	tr	...	...	4	0.1	2	tr	...	...	4,480	56.0
St. Clair Flats	...	...	...	...	...	...	...	...	...	...	...	...	71	0.9
Lake St. Clair	...	...	...	...	...	...	...	...	...	...	...	...	3,196	39.9
Detroit River	...	...	...	...	...	...	2	0.8	...	...	...	...	260	3.2
Total or Average	1	tr	1	tr	...	...	6	0.1	2	tr	...	...	8,007	100.0
OFFICERS AND STAFF:														
St. Clair River	...	...	...	...	2	0.3	5	0.7	...	...	1	0.1	721	35.5
St. Clair Flats	...	...	2	0.6	...	...	...	...	...	...	...	...	347	17.1
Lake St. Clair	...	...	...	...	...	...	1	0.1	...	...	...	...	756	37.3
Detroit River	...	...	...	...	...	...	...	...	...	...	...	...	205	10.1
Total or Average	...	...	2	0.1	2	0.1	6	0.3	...	...	1	0.1	2,029	100.0
TOTAL:														
St. Clair River	1	tr	1	tr	2	tr	9	0.2	2	tr	1	tr	5,201	51.8
St. Clair Flats	...	...	2	0.5	...	...	...	...	...	...	...	...	418	4.2
Lake St. Clair	...	...	...	...	...	...	1	tr	...	...	...	...	3,952	39.4
Detroit River	...	...	...	...	...	...	2	0.4	...	...	...	...	465	4.6
Total or Average	1	tr	3	tr	2	tr	12	0.1	2	tr	1	tr	10,036	100.0

ESTIMATE OF TOTAL FISHING YIELD

The data collected by the boat livery operators (Table 5) has been used as the basis for making an estimate of the total numbers of anglers, total hours fished, total numbers of fish taken and the total pounds of fish taken. The records secured by the conservation officers and members of the Institute staff has not been used as such in order to avoid duplication of data but has been used to determine the ratio of livery boats to privately-owned boats for the different divisions of the connecting waters. Table 12 gives the information on the number of livery-owned boats in each division and the degree of cooperation given in collecting creel census records. The means used in figuring the degree of cooperation offered by the liverymen has been discussed earlier. The factors were obtained by dividing the total number of boats by the number of cooperating boats.

Table 12

Number and percentage of livery-owned boats and the degree of cooperation in each of the four areas of the connecting waters between Lake Huron and Lake Erie, May 27-September 27, 1943

Area	Total number of livery-owned boats	Total boats cooperating		Total boats not cooperating		Factor
		No.	%	No.	%	
St. Clair River	337	67	19.9	270	80.1	5.03
St. Clair Flats	98	2	2.0	96	98.0	50.00
Lake St. Clair	508	50	9.8	458	90.2	10.20
Detroit River	123	6	4.9	117	95.1	20.41
Total or average	1,066	125	11.7	941	88.3	

Table 13 indicates the numbers and percentages of privately-owned boats interviewed by the conservation officers and Mr. Carbine during the summer of 1943 for each of the four divisions and for the total area. The factors were obtained by considering the percentage of livery-owned boats as a fraction of 100.

Table 13

Percentage of privately-owned boats among boats interviewed by conservation officers and staff members on the connecting waters between Lake Huron and Lake Erie, May 27 - September 27, 1943

Area	Total boats interviewed	Private boats interviewed	Percentage of private boats in total	Factor
St. Clair River	347	149	42.9	1.75
St. Clair Flats	152	104	68.4	3.16
Lake St. Clair	176	117	66.5	2.99
Detroit River	88	45	51.1	2.04
Total or average	763	415	54.4	

The estimates of the total number of anglers who visited the connecting waters between May 27 and September 27, 1943, the total number of hours spent fishing by these anglers, the total number of boats they used, all the fish they caught and the total weight of those fish from each of the four divisions are shown in Table 14. These figures were arrived at by multiplying the figures in Table 5 by the factors in Tables 12 and 13. The total figures for the entire connecting waters were obtained by addition of the figures from the individual areas and not by the direct use of factors. The figures in these estimates are based only on boat fishermen and do not include the many thousands of bank fishermen who utilize breakwaters, piers, dredge cuts, etc. along the waterfront for fishing purposes.

As indicated in Table 14 there were nearly 160,000 anglers who fished more than a million hours and caught over 600,000 fish which weighed over 170 tons. These figures are considerably lower than those for 1942 as shown in Table 15. In both years the St. Clair River produced a larger percentage of the total weight of the fish than any of the other three divisions, whereas Lake St. Clair produced a greater number of fish than any of the other divisions during each year of the census.

Table 14

Estimate of total anglers, total hours, total numbers and total weight of fish taken from the connecting waters between Lake Huron and Lake Erie, May 27-September 27, 1943

Area	Number of anglers	Number of boats	Total hours spent fishing	Number of legal fish taken	Weight of legal fish taken
St. Clair River	39,435	18,090	290,828	135,215	185,544
St. Clair Flats	11,218	4,898	95,748	28,282	35,913
Lake St. Clair	97,478	38,460	615,345	423,828	97,856
Detroit River	10,826	5,330	62,730	19,321	25,000
Totals	158,957	66,778	1,064,651	606,646	344,313

Table 15

Estimate of total anglers, total hours, total numbers and total weight of fish taken from the connecting waters between Lake Huron and Lake Erie, May 17-November 1, 1942

Area	Number of anglers	Number of boats	Total hours spent fishing	Number of legal fish taken	Weight of legal fish taken
St. Clair River	48,895	22,371	369,122	133,354	199,926
St. Clair Flats	12,852	5,825	93,671	38,959	27,256
Lake St. Clair	95,391	42,082	571,191	553,383	103,309
Detroit River	20,936	12,025	135,029	62,855	75,467
Totals	178,074	82,303	1,169,013	788,551	406,138

It is recommended that this study be repeated after the war in order to ascertain the maximum use and fishing pressure sustained by a large area of water so near an intensely populated district.

INSTITUTE FOR FISHERIES RESEARCH

By Louis A. Krumholz and  
W. F. Carbine

Report approved by A. S. Hazzard

Report typed by V. M. Andres