

Original: Fish Division

cc: Mr. Ruhl
Mr. Howard
Mr. Leeson
Mr. Eschmeyer

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
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REPORT NO. 353

ANALYSIS OF FISHING AND THE GAME FISH CATCH IN
PLEASANT LAKE, OAKLAND COUNTY, SUMMER OF 1935

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An intensive creel census on Pleasant Lake was carried on by a small crew of men from the Dodge-Bloomer State Park Camp (SP-3) during the summer and fall of 1935. This work was under the supervision of Camp Superintendent Charles M. Leeson and Assistant Superintendent Webb. The census on this lake was taken similar to those on Fife and on other lakes and the details of the manner in which the census was taken are not repeated here. In addition to the census, a survey of the shore-line and depth were taken last winter by the camp personnel. It is anticipated that a physical, chemical and biological survey of the lake will be completed sometime during the coming summer.

Pleasant Lake is located approximately six miles west of Pontiac. According to the marginal survey, it has an area of 86 acres. Maximum depth is approximately 26 feet. The lake has an extensive shoal area and abundant vegetation. It appears to be relatively quite productive. This lake was selected because of the ease with which the census could be taken on it. A road runs along the north end of the lake and nearly all fishermen leave the lake at that side. The several boat liveries are located there. A survey of the number of boats located there indicated that a total of 33 boats were available for rent at the liveries and that there were, in addition, 13 "private" boats on the lake.

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25 - 2 - ... days ... 1935
Daily Ave of 25.8 ... 98 days ...
10,000 - ...

The census-takers estimated that over 95% of the fishermen were contacted. Since the crew did not work after dark, a limited amount of night fishing did not come to their attention, but the night fishing was apparently quite limited. To conform with similar reports for other lakes, the summer period is considered as extending from the opening date (June 25th) to September 30th (inclusive). Fall and winter fishing are not included in this report; it may be stated, however, that, in comparison with summer fishing, they were negligible.

There is some indication that at times the species were not recognized by the crew or were inadvertently listed in the wrong column. These errors were relatively few and the data given below should be correct to within a few per cent. Such errors appear in all census work of this kind. The census was taken in an entirely satisfactory manner.

The Pleasant Lake summer census is the first of its kind on a southern Michigan lake and is therefore of especial interest. It is probable that a comparison of data for this lake and for several northern Michigan lakes will be made later. Discussion of the data follows the same order as that used in discussing the census on other lakes. A copy of the census blank used is included as Figure 1.

CREEL CENSUS—Michigan Department of Conservation

Lake or Stream..... Fisherman's Name.....
 Township..... City or Town.....
 County..... Sex?..... Approximate Age?.....

SPECIES CAUGHT	LEGAL SIZE		UNDERSIZE	
	Number	Av. Lgth.	Number	Av. Lgth.
Brook Trout.....				
Rainbow Trout.....				
Brown Trout.....				
Large Mouth Bass.....				
Small Mouth Bass.....				
Bluegills.....				
Sunfish.....				
Yellow Perch.....				
Pike Perch (Walleyes).....				
Northern (Grass) Pike.....				
.....				
.....				
.....				

Date.....193.....

Kind of Fishing:

Ice?..... Still Fishing?.....
 Boat?..... Trolling?.....
 Shore?..... Casting?.....
 No. of persons?..... Total No. of lines?.....
 Bait (Check if only one kind of bait used)
 How many fish caught with worms?.....
 Insects?..... Minnows?..... Spinner?.....
 Plug?..... Artificial Fly?.....
 If taken with other bait, or by spear, dipnet or other means, state how.....
Weather: Clear?..... Heavy Wind?..... Cold?.....
 (Check) Cloudy?..... Light Wind?..... Mild?.....
 Rain?..... Calm?..... Warm?.....

(Enter other kinds taken on blank spaces above)

TIME FISHED	A.M. >>	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼	▼
	HRS. P.M. >>	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲

Draw line through hours and quarter hours fished; double line through indicated time when fishing was best. Make out report whether fish are caught or not.

Fig. 1. Blank used for recording creel census data

Number of fishermen (See Table 1). Census returns were obtained ^{for} of a total of 2526 fisherman-days. Of these reports 2162 were for men and 363 or 14.3% were for women. A daily average of 25.8 persons fished the lake for the 98 day period. Fishing was most intensive during the first two weeks when an average of well over 40 persons per day fished the lake. The fishing represents a total of 29 fisherman-days per acre.

Number of fish, catch per hour, fish per fisherman and average size of all fish (See Table 2). The 2526 fisherman-days yielded a total of 10,095 fish having an average length of 7.7 inches each. The fishermen averaged 4.0 fish per day's fishing and caught them at an average rate of 1.0 fish per hour. The lake produced, on the average, 103 fish per day. This is only 12 fish per day less than were produced in an 800 acre northern Michigan lake during the same period. Pleasant Lake produced, during the summer, a total of 117 fish per acre.

Catch per hour varied decidedly from week to week. In general fishing was considerably better during the first half of the summer than it was during the second half. The average size of all fish caught varied relatively little throughout the season.

Analysis of the catch by species (See Table 3). The species were, in order of abundance in the catch: bluegills (Helioperca macrochira), perch (Perca flavescens), sunfish (Eupomotis gibbosus), calico bass (Pomoxis sparoides), bullheads (Ameiurus, either nebulosus or natalis or both), large-mouthed bass (Aplites salmoides), small-mouthed bass (Micropterus dolemieu), rock bass (Ambloplites rupestris), northern pike (Esox lucius) and dogfish (Amia calva). Over half of the fish taken were bluegills. Perch constituted approximately 15% of the catch, sunfish 11%, the two species of black bass combined about 6%. It will be noted that, for each of the species shown, the catch declined decidedly in late summer. It cannot be determined whether or not this is an indication of over-fishing.

Hours fished. The fishermen fished for a total of 10,540 hours, an average of 4.2 hours per fishing day. Time of day of fishing was recorded on the blank but these data were not compiled.

Table 1. Number of fishermen.
Pleasant Lake, summer of 1935.

Date	Number of fishermen			Ave. per day
	Male	Female	Total	
June 25-30	264	17	281	46.8
July 1-7	256	50	306	43.7
July 8-14	165	28	193	27.6
July 15-21	184	43	227	32.4
July 22-28	210	32	242	34.6
July 29-Aug. 4	174	35	209	29.9
Aug. 5-11	175	31	206	29.4
Aug. 12-18	184	45	230	32.9
Aug. 19-25	172	25	197	28.1
Aug. 26-Sept. 1	121	18	139	27.0
Sept. 2-8	89	8	97	13.9
Sept. 9-15	76	13	89	12.7
Sept. 16-22	67	9	76	10.9
Sept. 23-30	25	9	34	4.9
Totals	2162	363	2526*	25.8

* Includes one fisherman for whom sex was not listed.

Table 2. Number of fish taken, fish per hour, fish per fisherman (per day), and average size of all fish. Pleasant Lake, summer of 1935

Date	No. of fish taken	Fish per hour	Fish per angler	Average size of fish (in.)
June 25-30	1419	.9	5.0	7.8
July 1-7	1692	1.4	5.5	7.8
July 8-14	890	1.2	4.5	7.7
July 15-21	1006	1.0	4.4	7.5
July 22-28	736	0.8	3.0	8.1
July 29-Aug. 4	811	1.0	3.9	7.6
Aug. 5-11	1104	1.5	5.4	7.6
Aug. 12-18	657	.7	2.9	7.6
Aug. 19-25	750	.9	3.8	7.5
Aug. 26-Sept. 1	323	.5	2.3	7.6
Sept. 2-8	305	.9	3.1	7.0
Sept. 9-15	141	.4	1.6	7.6
Sept. 16-22	223	.8	2.9	7.5
Sept. 23-30	38	.4	1.1	7.8
Total or Average	10,095	1.0	4.0	7.7

Table 3. Analysis of the catch (for 8 species). Pleasant Lake, summer of 1935*

Period	Smallmouth bass			Largemouth bass			Bluegill			Sunfish		
	No.	Ave.	Per	No.	Ave.	Per	No.	Ave.	Per	No.	Ave.	Per
		size	hr.		size	hr.		size	hr.		size	hr.
June 25-30	36	11.7	.02	52	12.0	.03	498	7.2	.32	226	6.8	.15
July 1-7	51	11.0	.05	54	10.8	.05	1009	7.5	.85	264	7.3	.22
July 8-14	72	10.1	.10	21	11.6	.03	403	7.1	0.56	153	6.8	.21
July 15-21	16	10.4	.02	47	11.7	.05	509	6.8	0.51	137	6.9	.14
July 22-28	6	11.0	.01	98	12.3	.11	418	7.2	0.45	60	6.4	.06
July 29-Aug. 4	20	12.3	.02	17	10.8	.02	536	7.3	0.64	79	6.7	.09
Aug. 5-11	..	...	...	33	11.8	.05	932	7.5	1.28	35	6.9	.05
Aug. 12-18	3	11.0	tr.	15	12.5	.02	493	7.3	0.53	36	7.2	.04
Aug. 19-25	..	...	...	18	12.0	.02	578	7.1	0.67	42	7.0	.05
Aug. 26-Sept. 1	..	...	...	1	11.0	tr.	235	7.7	0.35	23	7.3	.03
Sept. 2-8	1	13.0	tr.	5	...	.01	155	7.2	0.44	10	7.1	.03
Sept. 9-15	4	11.5	.01	3	10.5	.01	94	7.3	0.26	11	7.0	.03
Sept. 16-22	..	...	...	8	11.8	.03	162	6.9	0.55	4	7.0	.01
Sept. 23-30	..	...	...	2	11.	.01	26	7.0	0.19	..	...	...
Total	209	11.5	.02	374	11.7	.03	6048	7.2	0.57	1080	6.9	.10

Period	Calico bass			Perch			Northern pike		Bullhead	
	No.	Ave.	Per	No.	Ave.	Per	No.	Ave.	No.	Ave.
		size	hr.		size	hr.		size		size
June 25-30	74	8.8	.05	475	7.7	.31	2	16.0	54	10.5
July 1-7	34	9.6	.03	232	7.9	.20	1	16.0	44	8.1
July 8-14	61	8.9	.09	103	7.9	.14	2	20.0	27	8.8
July 15-21	133	8.3	.13	133	7.9	.13	2	16.3	29	9.1
July 22-28	18	9.2	.02	66	7.4	.07	8	14.0	61	8.2
July 29-Aug. 4	14	9.0	.02	79	7.4	.09	..	...	66	9.1
Aug. 5-11	32	8.5	.04	52	7.5	.07	..	...	20	8.7
Aug. 12-18	42	7.2	.04	51	8.2	.05	1	18.0	15	10.0
Aug. 19-25	11	9.7	.01	58	8.0	.07	..	...	42	10.4
Aug. 26-Sept. 1	4	8.2	.01	48	7.2	.07	..	...	12	8.6
Sept. 2-8	..	...	...	131	6.6	.37	..	...	3	10.5
Sept. 9-15	2	11.0	.01	24	7.9	.07	..	...	3	7.7
Sept. 16-22	4	8.2	.01	18	7.3	.06	..	...	27	9.9
Sept. 23-30	..	...	...	8	8.5	.06	..	...	1	8.0
Total	429	8.6	.04	1478	7.7	.14	16	15.5	404	9.2

* Rock bass and dog fish were also taken. They constituted an insignificant portion of the total catch.

Method of fishing and kind of bait (See Tables 4, 5 and 6). More than 90% of the records were for still-fishing (of those records listing only one method). Nine per cent fished by casting and approximately 1% by trolling. Since trolling generally produces few fish and large fish in comparison with other methods, the figures for the catch by this method on Pleasant Lake appear unusual. Casting produced the largest fish, on the average, and the fewest. A third of those who still-fished took no fish; over half of those who fished by casting took no fish. Details on methods are shown in Table 4.

Six kinds of bait are listed ~~are listed~~, three artificial and three natural. It will be noted in Table 5 that natural bait took the most fish per hour while artificial bait took fish of the largest average size. A majority of the fishermen fished with worms. Insects produced the most fish per hour. The relationship generally found; that the bait taking the most fish per hour takes also the smallest and visa versa, also that the bait taking the smallest fish is most likely to take fish, applies here also with minor exceptions.

The effectiveness of each type of bait for catching fish of various species is shown in Table 6. It will be noted that large-mouthed bass bit best on artificial flies with spinners a close second, small-mouthed bass bit best on minnows and flies, bluegills bit best on insects with worms second, sunfish bit best on flies with worms second, perch and calico bass bit decidedly better on minnows than on other baits and bullheads bit best on worms.

Relation between fishing and weather. Data on wind direction, air and water temperature, wave action and degree of cloudiness, were taken each day by the census crews at 3 hour intervals. These data have not yet been compiled. They should eventually show to what degree fishing was affected by the various meteorological conditions.

Comparison of men and women as fishermen (Table 7). Table 7 shows the catch per hour and average size of fish caught by males and by females each week. On the average men invariably caught more fish per hour than women and for all weeks except one the fish caught by the males were as large as, or larger than, those taken by the women.

Table 4. General data on methods of fishing.
Pleasant Lake, summer of 1935*

Method	Repts. covering each method		Fish taken by each method	Fish per day's fishing	Fish per hour	Ave. length of fish inches	Repts. indicating no fish caught	
	No.	%					No.	%
Trolling	16	1	123	7.7	1.6	6.5	4	25%
Casting	201	9	281	1.4	0.5	10.1	110	55%
Still-fishing	2104	91	8984	4.3	1.0	7.1	717	34%

* Not including records listing more than one method during the day's fishing.

Table 5. General data on effectiveness of various kinds of bait used.
Pleasant Lake, summer of 1935*

Bait used	No. of records	% getting no fish	Hrs. per fishing day	Catch per hour	No. of fish taken	Ave. size of all fish (in.)
<u>Artificial:</u>						
Spinner	14	43	4.2	0.4	24	9.2
Plug	118	56	2.6	0.3	102	11.4
Art. fly	32	40	3.2	0.7	74	9.7
<u>Natural:</u>						
Minnows	150	24	3.9	1.0	609	8.5
Worms	1,347	36	4.2	.9	5,316	7.5
Insects	172	26	4.6	1.1	1,101	7.5

* Not including records listing more than one kind of bait per day's fishing.

Table 6. Analysis of catch (by species) on various kinds of bait.
Pleasant Lake, summer of 1935

	All species	Largemouth bass	Smallmouth bass	Bluegills	Sunfish	Perch	Calico bass	Bullheads
ARTIFICIAL BAIT								
<u>Spinner:</u>								
Number caught	24	9	...	4	2	3	6	...
Average size	9.2	11.4	...	7.2	6.5	7.5	9	...
Catch per hr.	0.4	.15	...	.07	.03	.05	.10	...
<u>Plug:</u>								
Number caught	102	74	9	13	...	2	2	...
Average size	11.4	12.5	11.	6.2	...	6.8	9.5	...
Catch per hr.	0.3	.24	.03	.04	...	.01	.01	...
<u>Artificial Fly:</u>								
Number caught	74	27	6	12	15	5	3	...
Average size	9.7	12.6	10.5	7	6.0	7.8	7.0	...
Catch per hr.	0.7	.26	.06	.12	.15	.05	.03	...
NATURAL BAIT								
<u>Minnows:</u>								
Number caught	609	46	43	118	20	188	178	10
Average size	8.5	11.6	11.5	7.3	7.1	7.9	8.5	10
Catch per hr.	1.0	.08	.07	.20	.03	.32	.31	.02
<u>Worms:</u>								
Number caught	5316	116	69	3114	733	838	94	296
Average size	7.5	11.	10.8	7.2	7.0	7.7	8.7	9.1
Catch per hr.	0.9	.02	.01	.54	.13	.15	.02	.05
<u>Insects:</u>								
Number caught	1101	8	6	1005	34	19	27	1
Average size	7.5	12.2	...	7.5	7.1	7.2	7.2	10
Catch per hr.	1.4	.01	.01	1.27	.04	.02	0.3	tr.

Table 7. Comparison of men and women in catch per hour and average size of fish

Period	Male		Female	
	Catch per hour	Average size	Catch per hour	Average size
June 25-30	0.9	7.8	0.6	7.8
July 1-7	1.5	7.8	1.0	7.6
July 8-14	1.3	7.7	1.0	7.5
July 15-21	1.2	7.5	0.5	7.5
July 22-28	0.9	8.1	0.3	8.0
July 29-Aug. 4	1.0	7.7	0.9	7.3
Aug. 5-11	1.7	7.7	0.6	7.3
Aug. 12-18	0.8	7.6	0.4	7.9
Aug. 19-25	0.9	7.5	0.5	7.4
Aug. 26-Sept. 1	0.5	7.6	0.2	7.5
Sept. 2-8	0.9	7.0	0.4	6.9
Sept. 9-15	0.4	7.7	0.2	6.8
Sept. 16-22	0.8	7.5	0.5	6.7
Sept. 23-30	0.4	7.8	0.03	7.5
Average	1.0	7.7	0.6	7.5

For the entire season men averaged one fish per hour while women averaged only a little more than half that.

Residence of anglers. Only four reports were listed for non-residents. This is in decided contrast with records for northern Michigan where reports for non-residents constitute a relatively large percentage (varying up to 50%) of the total reports. The average distance traveled by the fishermen is likewise in decided contrast with that for northern Michigan lakes. The distance traveled by 25-mile zones (approximate air line distance) were as follows:

0 - 25 miles	2277	records
25 - 50 "	2	"
50 - 75 "	3	"
75 - 100 "	1	"
No answer	228	"
Not determined	15	"

It will be noted that most of the fishermen traveled 25 miles (by air-line) or less to fish this lake. About half of the fishermen listed their residence as Detroit. The line between the 0-25 mile and 25-50 mile zones passes through Detroit, so some of the fishermen from that city were probably in the second (25-50 mile) zone rather than the first (0-25 miles). All were placed in the one zone in this report since it was impossible to determine in what part of Detroit the fishermen lived. Pontiac ranked second in number of records. Residences of anglers with number of records from each locality are listed below:

Adrian 3, Berkley 2, Big Beaver 3, Birmingham 16, Clarkston 1, Clawson 31, Dearborn 30, Detroit 1334, Drayton Plains 2, Farmington 1, Ferndale 14, Flint 1, Fulton 2, Highland Park 1, Keego Harbor 1, Lincoln Park 3, Manchester 1, Milford 2, Pontiac 788, Rochester 1, Royal Oak 27, Utica 6, Waterford 9, Wayne 3, Woodland 1.

The number of residences is relatively small when compared with the number for fishermen on northern Michigan lakes.

A census on this lake for another season would be especially desirable to show fluctuations between the several seasons and to help determine the general trend of the fishing.

The data for this report were compiled by the Institute assisted by the
Sorting and Tabulating Department of the University of Michigan.

INSTITUTE FOR FISHERIES RESEARCH

By R. W. Eschmeyer
R. W. Eschmeyer