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THE STURGEON FISHERY OF BLACK, BURT, AND MULLETT LAKES, CHEBOYGAN COUNTY, 1957-1958

by

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A questionnaire-type census of Michigan's winter sturgeon fishery at Black, Burt, and Mullett lakes, Cheboygan County, was conducted in 1956-1958. Questionnaires (identical for each of the 3 years) were mailed to the owners of ice shanties on the sturgeon-spearing grounds at the beginning of the open season; a second form was sent approximately 2 months after the close of the season to all owners who failed to answer the first inquiry.

In an effort to collect material for the analysis of age and growth of sturgeon, a 9 by 12-inch Manila business-reply envelope, containing aluminum foil for wrapping the pectoral fin, accompanied the questionnaires to each fisherman during the 1957 and 1958 seasons. A conventional scale-sample envelope was attached to the back of the large envelope so that the fisherman could record the locality, length, weight, and sex for each sturgeon speared. Each fisherman sending in a fin was later notified of the age of his sturgeon. The return-postage envelope provided spearers with a convenient method for returning questionnaires, whether or not any sturgeon were taken.

Census findings for the 1956 sturgeon season were summarized in a previous report[1] (which includes a copy of the questionnaire and a map showing the location of the sturgeon-spearing grounds). The present report compares the 1956 data with the 1957-1958 results, and presents age and growth data obtained thus far.

In 1958 the sturgeon season was shortened from a two-month season (January and February) to only the month of February.

Methods

The total number of ice shanties on each of the three lakes each year was determined by an aerial count in midseason (Table 1). A direct count by a man on the ice then revealed the number of personal, rental, and unnamed shanties (classification undetermined) on the sturgeon grounds. Questionnaires were sent to all owners of shanties for personal use on the sturgeon grounds and, from the number of returns, the percentage of fishermen who did not spear for sturgeon was determined. (Unnamed shanties were considered as personal shanties.)

At the onset of the 1957 season, questionnaires were mailed to all fishermen who had speared for sturgeon in 1956. Later (February 25-26), a personal inventory indicated that many of the 1956 spearers did not spear in 1957, and that there were shanties on the sturgeon grounds that had not been there in 1956. Also, it was found that many shanties had already been removed from the ice. Although 117 individuals were contacted by

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[1] Henry J. Vondett. 1957. A questionnaire census of sturgeon spearing, January-February, 1956, on Black, Burt and Mullett lakes, Cheboygan County. Institute for Fisheries Research Report No. 1529.

Table 1. --Total number of shanties on the ice and the number of personal, rental, and unnamed shanties on the sturgeon-spearing grounds of Black, Burt, and Mullett lakes, 1956-1958

Type of shanty	Lake and year[1]								
	Black			Burt			Mullett		
	1956	1957	1958	1956	1957	1958	1956	1957	1958
Total shanties (Aerial count)	153	148	181	129	125	164	191	177	159
Sturgeon-spearing shanties									
Personal	51	45	49	17	16	19	38	25	13
Rental	13	22	25	11	11	2	17	17	15
Unnamed	6	3	0	1	1	0	2	2	1
Total	70	70	74	29	28	21	57	44	29

[1] Figures for 1957 (except rental shanties at Black Lake) are estimates based on an average of the ratios of total number of shanties seen from the air to the total number of shanties on the sturgeon-spearing grounds in 1956 and 1958.

questionnaire in 1957, this did not reflect accurately the number of individuals who speared for sturgeon. Therefore, a ratio of the total number of shanties (determined by aerial count) to the number of sturgeon-spearing shanties (determined by survey on the ice) was determined for 1956 and 1958. This ratio was then applied to the 1957 aerial count to estimate the number of sturgeon-spearing shanties for 1957. Using this same method the number of personal, rental, and unnamed shanties was also estimated, except for rental shanties at Black Lake (the direct count of 22 was accepted rather than the estimated total of 17). Accordingly, the estimate of the total number of shanties on the sturgeon grounds in 1957 was 142; of these, 129 were estimated to have been used for sturgeon spearing.

Sturgeon spearing results, 1957

Fishing data for 1957 were taken from the questionnaires returned and projected by direct proportion to the estimated number of shanties used for sturgeon spearing.

A total of 701 fishermen days or 3,588 hours were spent by 32 spearers who returned questionnaires. The average number of hours fished per day (total hours divided by the number of days) was 5.1. These same fishermen took a total of 4 sturgeon (1 per 897 hours). Twelve fishermen at Black Lake reported 277 days of spearing; 7 at Burt Lake, 181 days; and 13 at Mullett Lake, 243 days. In addition, 220 rentals of shanties to others were reported by the 32 individuals answering questionnaires. Considering each rental as a fisherman day, and using the average number of hours fished per day by spearers in each lake, the rentals accounted for 1,163 additional hours.

The reported fishing pressure was then 4,751 hours. The projection of the actual number of hours spent spearing by the 32 reporting individuals, or spent in their shanties when rented, to the total estimated number of spearers using personal or rental shanties, yielded a total estimated fishing pressure of 10,628 hours for the three lakes (Table 2).

The quality of sturgeon fishing in 1957 was considered to be especially poor (21 out of 29 individuals who responded to this inquiry on the questionnaire felt that spearing was worse than in previous years and 8 considered it to be the same), partly because the ice on the lakes was too thin for the setting of shanties on the first of January, and because visibility in the water was poor during the early part of the season (a period of 2 to 3 weeks is usually necessary after ice formation for the water to clear and offer good visibility to spearers). The 32 individuals who returned questionnaires reported the spearing of only 8 sturgeon, weighing approximately 545 pounds, of which 4 were taken in rental shanties (1 sturgeon per 291 hours of fishing) and 4 in personal shanties (1 sturgeon per 897 hours of fishing). The total estimated catch for the three lakes was 17 sturgeon weighing approximately 1,048 pounds (Table 2).

The 5 sturgeon from Black Lake, for which length and/or weight were reported by fishermen, ranged from a length of 43 inches (weight unknown) to 77 inches (97.5 pounds); the average size was 53 inches and 40 pounds. One sturgeon speared in Burt Lake was 71.5 inches long and weighed 106.5 pounds. One sturgeon taken from Mullett Lake was 72.5 inches in length and weighed 136 pounds; the other weighed 104 pounds.

Table 2. --Summary of sturgeon fishing reported by questionnaires, and estimated total sturgeon fishing, in Black, Burt, and Mullett lakes, 1957

Lake	Shanty type	Number of spearers	Spearers reporting	Census coverage (percentage)	Fishing data from questionnaires					Estimated total fishing	
					Days	Total hours	Average hours per day	Number of fish	Hours per fish	Number of hours	Number of fish
Black	Personal	42	12	28.6	277	1,314	4.7	2	657	4,599	7
	Rental	22	..	...	77	365	4.7	3	122	578	5
	Total	64	..	...	354	1,679	4.7	5	336	5,177	12
Burt	Personal	14	7	50.0	181	823	4.5	1	823	1,646	2
	Rental	11	..	...	39	177	4.5	0	...	487	0
	Total	25	..	...	220	1,000	4.5	1	1,000	2,133	2
Mullett	Personal	23	13	56.5	243	1,451	6.0	1	1,451	2,567	2
	Rental	17	..	...	104	621	6.0	1	621	751	1
	Total	40	..	...	347	2,072	6.0	2	1,036	3,318	3
Total	Personal	79	32	40.5	701	3,588	5.1	4	897	8,812	11
	Rental	50	..	...	220	1,163	5.3	4	291	1,816	6
	Total	129	..	...	921	4,751	5.2	8	594	10,628	17

A total of 10 sturgeon were reported seen, but not speared, by fishermen in the three lakes (one legal-sized sturgeon and 3 smaller ones in Black Lake, one legal and 5 smaller fish in Mullett Lake, and none in Burt Lake).

Sturgeon spearing results, 1958

Fishing pressure for sturgeon declined considerably in 1958. Undoubtedly this was due to the shorter season (only the month of February) and was also influenced to some extent by the poorer fishing quality in 1957, compared to 1956. However, as shown by the census figures, 1958 was a more successful year for the spearers than 1957 (Table 3).

Physical counts of shanties on the spearing grounds were made on February 1 and 22 in 1958. The double check on the fishery was helpful in obtaining more data for age and growth analysis on the sturgeon. An aerial count in February revealed a total of 504 shanties on Black, Burt, and Mullett lakes, whereas the number of shanties on the sturgeon-spearing grounds was determined by direct count to be 124 (74 on Black, 21 on Burt and 29 on Mullett Lake). Of these, 108 (Black, 66; Burt, 16; Mullett, 26) were estimated to have been actually used for spearing.

Questionnaires were sent to 81 individual shanty owners; the remaining 43 shanties included 42 being used for rental, plus one unidentified. Of the 81 questionnaires mailed, 3 were returned for insufficient address and 37 were completed and returned by fishermen. A second questionnaire sent to the 41 fishermen who failed to answer the first inquiry resulted in 10 more returns for a total of 47 (58 percent); of the 47, 9 (19 percent) had not fished for sturgeon, leaving a total of 38 spearers reporting. It was estimated that 6

Table 3. --Summary of sturgeon fishing reported by questionnaires, and estimated total sturgeon fishing, in Black, Burt, and Mullett lakes, 1958

Lake	Shanty type	Number of spearers	Spearers reporting	Census coverage (percentage)	Fishing data from questionnaires					Estimated total fishing	
					Days	Total hours	Average hours per day	Number of fish	Hours per fish	Number of hours	Number of fish
Black	Personal	41	24	58.5	240	1,412	5.9	4	353	2,412	7
	Rental	25	..	...	123	723	5.9	8	90	1,288	14
	Total	66	..	...	363	2,135	5.9	12	178	3,700	21
Burt	Personal	14	9	64.3	134	645	4.8	0	...	1,003	0
	Rental	2	..	...	5	24	4.8	0	...	33	0
	Total	16	..	...	139	669	4.8	0	...	1,036	0
Mullett	Personal	11	5	45.5	101	656	6.5	2	328	1,443	4
	Rental	15	..	...	40	260	6.5	0	...	299	0
	Total	26	..	...	141	916	6.5	2	458	1,742	4
Total	Personal	66	38	57.6	475	2,713	5.7	6	452	4,858	11
	Rental	42	..	...	168	1,007	6.0	8	126	1,620	14
	Total	108	..	...	643	3,720	5.8	14	266	6,478	25

(19 percent) of the 34 non-reporting individuals also would not have fished for sturgeon. This leaves an estimated total of 66 (38 reporting and 28 non-reporting) personal-shanty owners who speared for sturgeon. Sampling covered 38 individuals, or 57.6 percent of the estimated spearers (Table 3). Similar computations for each lake indicated that the percentage of the fishing in personal shanties which was covered by the sampling was 58.5 in Black Lake, 64.3 in Burt Lake, and 45.5 in Mullett Lake.

A total of 475 fishermen days (2,713 hours) were spent by the 38 individuals who reported spearing (Table 3). The average number of hours fished per day (total hours divided by the number of days) was 5.7. These same individuals reported taking 6 sturgeon, or 1 per 452 hours of fishing. Spearers reported 240 days of fishing in Black Lake, 134 in Burt Lake, and 101 in Mullett Lake. In addition, 168 rentals of shanties were reported by the 38 individuals who answered questionnaires. Considering each rental as a fisherman day, and by using the average number of hours fished per day by spearers in each lake, they account for 1,007 additional hours. By projecting the reported hours spent by spearers in personal shanties and by spearers in rented shanties to the estimated total hours spent by spearers in each type of shanty, the total fishing pressure for sturgeon on the three lakes was estimated to be approximately 6,478 hours (3,152 hours less than in 1956 and 4,150 hours less than in 1957).

Of the 6 sturgeon reported by the 38 fishermen, 4 were speared in Black Lake, and 2 in Mullett Lake (none in Burt Lake). In addition, spearers in rental shanties took 8 sturgeon in Black Lake, but none in Burt or Mullett

lakes. A total catch of 14 sturgeon in personal and rental shanties was thus reported. By projection of these data, the total estimated catch was 25 sturgeon weighing approximately 1,204 pounds. The amount of fishing time per sturgeon for personal and rental shanties (data combined) was 266 hours, as compared to 127 in 1956 and 594 in 1957 (Table 4).

Of the 30 individuals who answered the question of whether they thought spearing was better or worse than in preceding years, only 3 considered fishing better; 21 felt it was worse, and 6 said it was the same. These opinions are supported by the fishing data from the questionnaires. In 1956, when an estimated 70 sturgeon were speared, the majority of the fishermen felt fishing was the same or better than in previous years, whereas in 1957 and 1958 they reported fishing to be definitely worse.

Numbers of sturgeon seen but not speared during 1958 were reported as follows: in Black Lake, 16 legal-size sturgeon and 10 smaller ones; in Burt Lake, 7 legal-size and 3 smaller sturgeon; and in Mullett Lake, 1 legal-size sturgeon, but no smaller ones. These sightings represented a slight increase from 1957, but a considerable decrease from 1956, especially for Black and Mullett lakes. (Spearers on Black Lake, for example, reported seeing 34 legal sturgeon and 21 smaller ones in 1956.) In the three years of census, the average number of small sturgeon observed in Black Lake was more than 5 times greater than in Burt Lake and twice as great as in Mullett Lake.

The reason for the large discrepancy between shanty owners and shanty renters in the average number of hours of fishing required to take one sturgeon is unknown. This difference (approximately three times more time required in

Table 4. --Reported and estimated total hours of fishing, number of sturgeon taken, and hours of fishing per sturgeon speared in Black, Burt, and Mullett lakes, 1956-1958

Lake	Year	Census data		Estimated total		Hours per sturgeon		
		Hours	Sturgeon	Hours	Sturgeon	Personal shanties	Rental shanties	Average
Black	1956	3,519	42	5,076	55	131	48	84
	1957	1,679	5	5,177	12	657	122	336
	1958	2,135	12	3,700	21	353	90	178
Burt	1956	1,261	4	1,347	4	261	...	315
	1957	1,000	1	2,133	2	823	...	1,000
	1958	669	0	1,036	0	...	...	...
Mullett	1956	1,802	6	3,207	11	321	199	300
	1957	2,072	2	3,318	3	1,451	621	1,036
	1958	916	2	1,742	4	328	...	458
Total	1956	6,582	52	9,630	70	185	63	127
	1957	4,751	8	10,628	17	897	291	594
	1958	3,720	14	6,478	25	452	126	266

personal than in rental shanties), has been consistent throughout the 3 years of censusing. It seems illogical that an inexperienced spearer, using a rented shanty, would be more adept at spearing than an experienced one using his own shanty. Since the majority of spearers were local people and tended to pursue the fishery commercially rather than for sport, perhaps they were reluctant to report all sturgeon speared, but still reported the hours spent fishing. The estimated total number of sturgeon speared corresponded closely, however, with the total number of sturgeon that spearers themselves thought had been taken. The discrepancy noted could be one fallacy of a voluntary, questionnaire-type census and quite possibly could not be eliminated without considerable difficulty.

Length, weight, and age of sturgeon

In the 3 years of censusing Michigan's sturgeon fishery, the length, weight, and sex of 33 sturgeon were obtained; in addition, the length and weight of 8 sturgeon and the length of 4 other sturgeon were recorded. The length and weight of 15 sturgeon (3 with the sex known) taken in Mullett Lake and 1 from Black Lake in 1955, and 1 from Mullett Lake in 1952, were copied from the "sturgeon contest" records at Glen's Bait Shoppe in Cheboygan. Length, weight, and sex were obtained from 10 additional fish in 1960, thus making a total of 49 individuals for which this information is available (Fig. 1).

The growth rate of sturgeon in Michigan is not accurately known, although the data collected give an indication of their length-weight relationship and the growth pattern for a limited size range. No fish smaller than legal size have

Figure 1. --The length and weight of 68 sturgeon speared in Black, Burt and Mullett lakes, 1952-1960 (solid circles - Black Lake; open circles - Burt or Mullett lakes. Sex indicated when known).

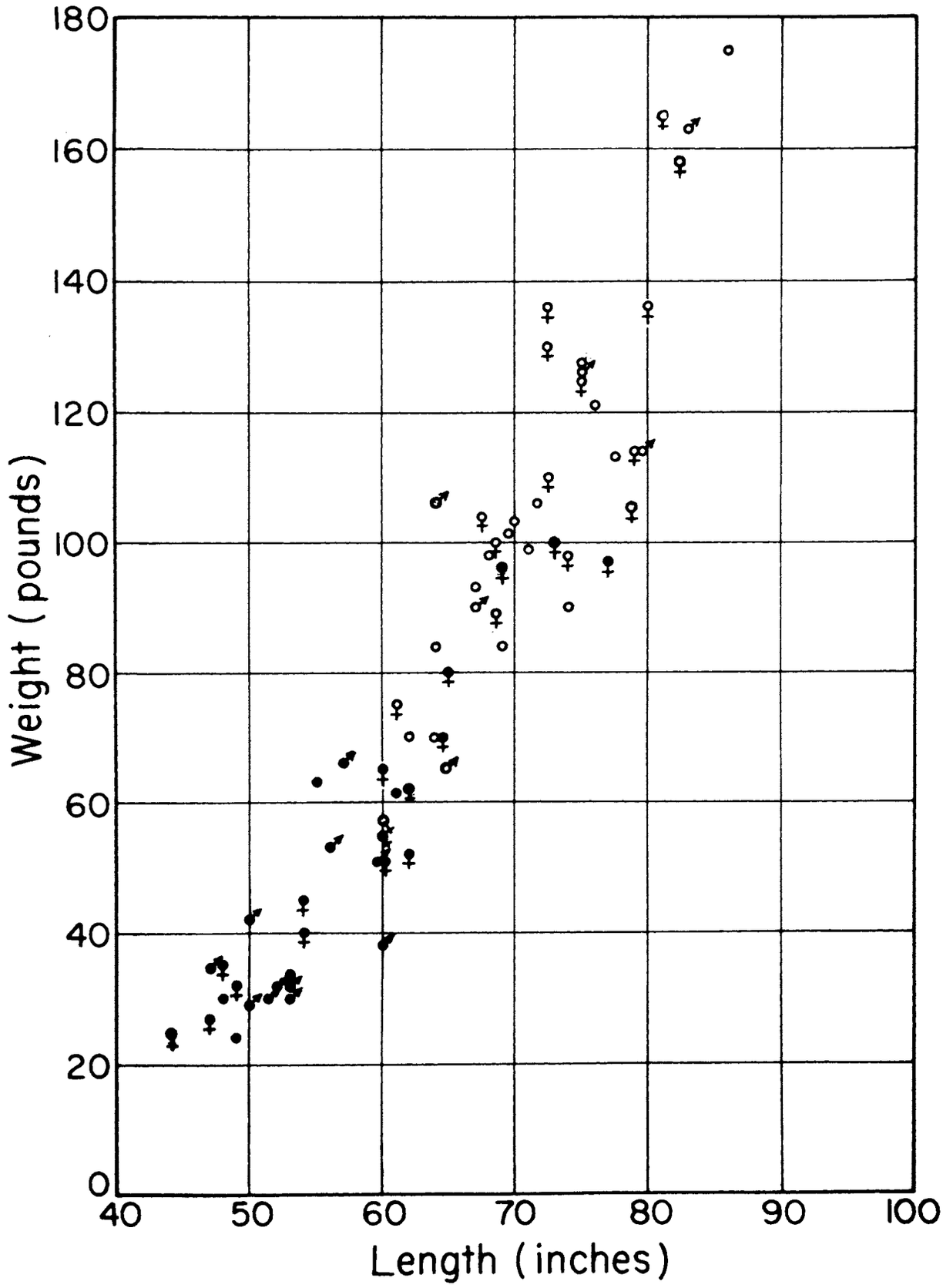
180
160
140
120
100
80
60
40
20
0
Weight (pounds)
40
50
60
70
80
90
100
Length (inches)

Figure 1

been collected. Sturgeon from Burt and Mullett lakes were combined in Figure 1 because no discernible difference in their length-weight relationship in the two lakes could be detected. There is an apparent difference in the size of sturgeon in relationship to their sex; however, due to the small amount of data collected thus far, this statement may not be entirely justified. Females comprised the majority (78 percent of the fish sexed) of sturgeon over 60 inches long and sturgeon of this size were predominantly from Burt and Mullett lakes. All sturgeon under 60 inches long were mainly males (63 percent) and were speared in Black Lake. In fact, only 4 sturgeon over 65 inches in length (all females) were taken from Black Lake. To summarize, the data indicate that a large proportion of the sturgeon removed from Black Lake are removed before they reach 60 inches in length, whereas in Burt and Mullett lakes few, if any, are harvested below this size. The limited data collected thus far suggest that Michigan sturgeon weigh about 12 to 15 pounds when they first attain legal size (42 inches), and about 150 pounds at a length of 80 inches.

The anterior marginal ray of the pectoral fin was used in the determination of the age of sturgeon. Transverse sections, about one-sixteenth inch in thickness, were cut from the dried fin ray with a fine-toothed vibrator jig-saw. Using No. 150 (4/0) carborundum finishing paper, No. 220 A (6/0) Garnet paper, and No. 280 A Rub-Wet Crystalon abrasive paper, the sections were worked down to about 0.015 of an inch in thickness, as described by Pycha (1955). The proper thickness of the cross-section can be determined by checking frequently with a binocular microscope using low or medium magnification and determining when the translucent and opaque zones appear definite in outline. Immersion of the

section in a 50-percent solution of alcohol immediately prior to examination produced a higher degree of differentiation between the two zones (Probst and Cooper, 1954).

The pectoral fin ray, by nature of its development, lends itself for use in age determinations of sturgeon. Probst and Cooper (op. cit.) concluded that the translucent zones visible in cross-sections of the pectoral fin ray are valid year marks, and this was further substantiated by correlation between the length- and age-frequency distribution of sturgeon taken from Wisconsin waters.

Age determinations were made for 25 sturgeon--13 from Black Lake, 11 from Mullett Lake, and 1 from Burt Lake. The age, length, and sex of the fish are shown in Figure 2. Three examples of the fin-ray sections are shown in Figures 3-5. Determination of the age of large or old sturgeon is difficult because the annular markings become closer and less distinct as the fish grows older. The ages shown, and particularly those for Mullett Lake sturgeon, are approximate, but are believed to be within 4 or 5 years of the actual age of the fish. Only one of the sturgeon aged was measured by the authors; length and weight data for the others are as reported by spearers. The available age and growth material suggests (by projection of the age-length curve of Fig. 2) that sturgeon reach the 42-inch minimum legal size at an age of about 15 years.

Factors affecting the population of sturgeon

The construction of dams and the progress of agriculture in the drainage system undoubtedly have had marked effect on the sturgeon population in Black,

Figure 2. --Age-length relationship of 25 sturgeon speared in Black Lake (solid circles) or Burt and Mullett lakes (open circles), 1955-1960. (Sex is indicated when known.)

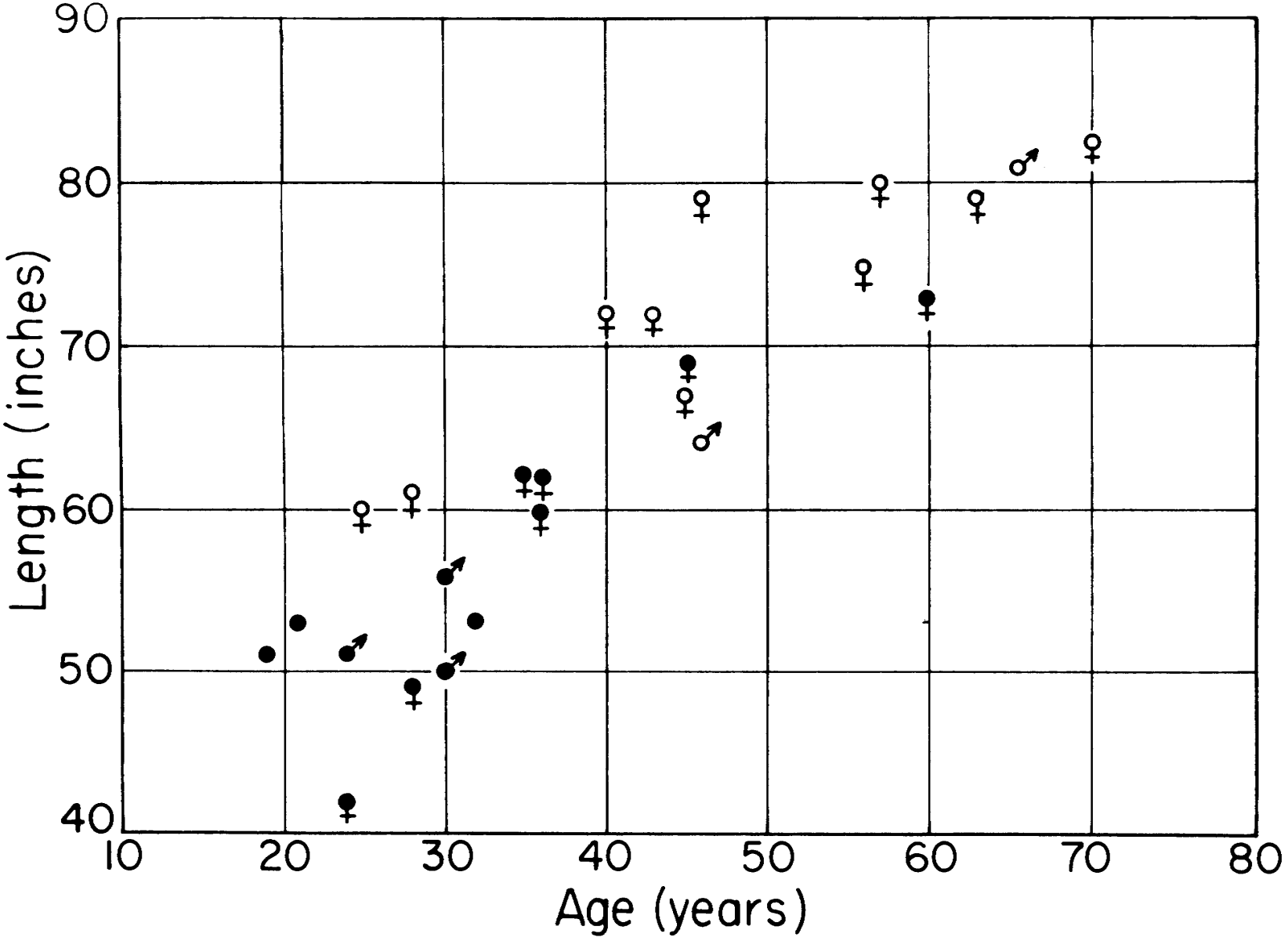

Figure 2

Figure 3. --Fin-ray section from a 50-inch, 42-pound, male sturgeon speared in Black Lake, Cheboygan County, in February, 1957. The fish was estimated to be about 30 years of age.

Figure 3

Figure 4. --Fin-ray section from a 79-inch, 114-pound, male sturgeon speared in Mullett Lake, Cheboygan County, in 1952. The fish was estimated to be about 46 years of age.

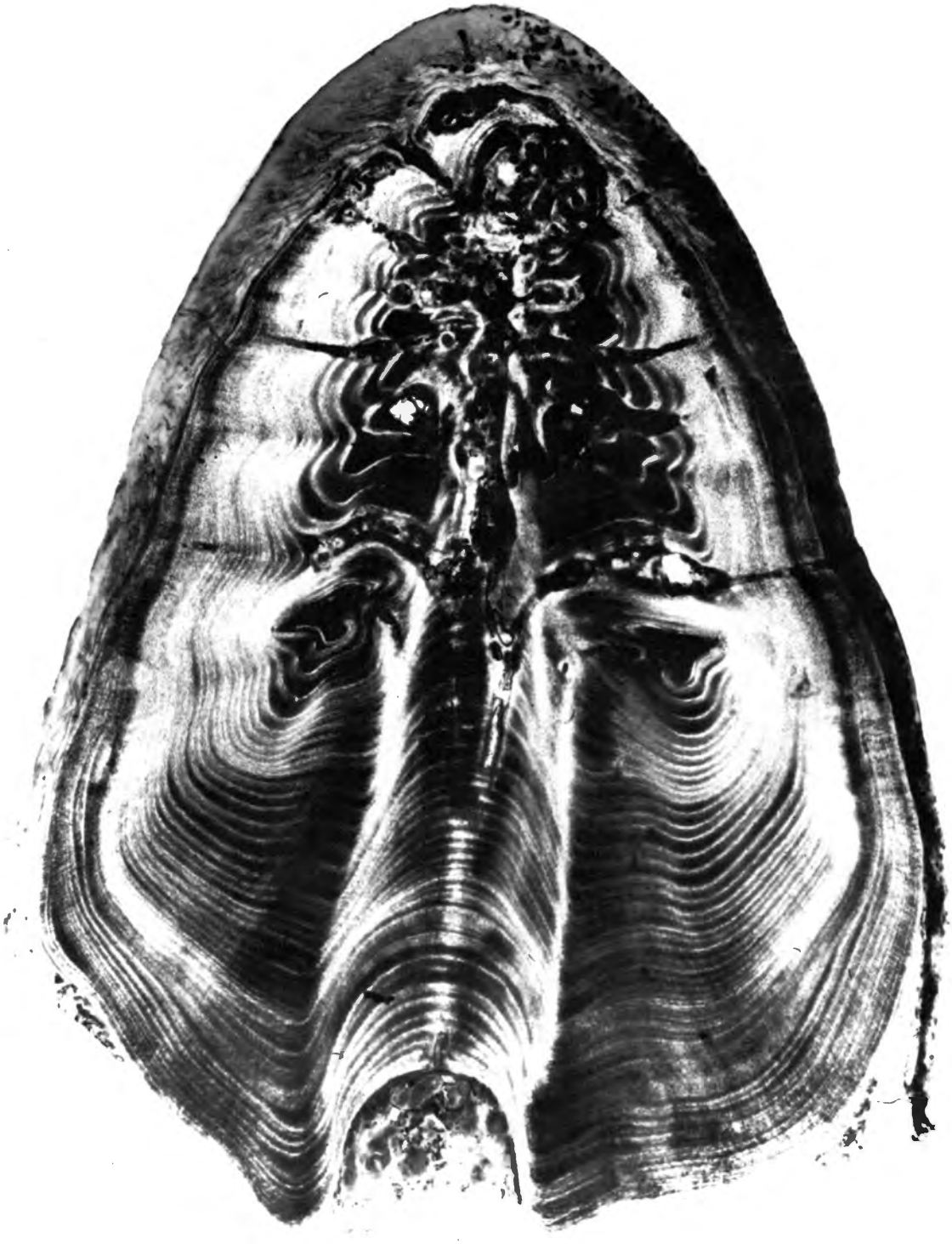

Figure 4

Figure 5. --Photo of a fin-ray section from an 80 3/4-inch, 165-pound, female sturgeon speared in Mullett Lake, Cheboygan County, in January, 1955. The fish was estimated to be 65 (±5) years of age.

Figure 5

Burt, and Mullett lakes. Since about 1868 the population in the three lakes has probably been separated from that of the Great Lakes by a 14.5-foot dam in the Cheboygan River at Cheboygan. In 1903 the Alverno Dam (19.5-foot head) was erected on the Lower Black River, between Black Lake and the Cheboygan River. From then on, the Black Lake sturgeon population must have been separated from that of Burt and Mullett lakes. The building of the Tower Dam (19-foot head) 13 miles up the Upper Black River, a major inlet of Black Lake, in 1922 probably restricted the spawning area of the species, and it was probably further curtailed in 1949 by the Kleber Dam, built approximately 3 miles downstream from Tower. Sturgeon reportedly run up the Upper Black River from Black Lake to the Kleber Dam during the spawning run in May (not observed by the authors) and can be seen in considerable numbers immediately below the dam. Sturgeon on a spawning run have been seen by Department personnel immediately below the Alverno Dam on the Lower Black River, the major outlet of Black Lake, which would indicate that these fish were from Mullett or Burt lakes. The Alverno Dam prevents the sturgeon population of Burt and Mullett lakes from intermingling with the Black Lake population.

On August 19-20, 1958, in an attempt to collect young-of-the-year sturgeon for age determination, electrofishing with a 110-volt alternating-current shocker was carried out in two locations on the Upper Black River. Each area fished was approximately three-fourths of a mile in length, one located about 3 miles upstream from Black Lake, the other about 2 miles below Kleber Dam. The lower of the two areas had a barren sandy bottom with holes in the stream bed ranging from 3 to 10 feet in depth. The upper area had a bottom type composed

of coarse gravel, rubble, and rocks; depressions in the river bed ranged up to 6 feet in depth. No young sturgeon were observed in either section of the river. The principal species present were darters and perch, and there were a few suckers and rock bass.

Electrofishing was also carried out in the upper reaches of the Pigeon River flats where the Pigeon River empties into Mullett Lake. This is a floodwater-type area, with many small sluggish channels averaging 1 to 2 feet in depth with a few holes 3 to 4 feet deep. As in the Black River, darters made up a large proportion of the fish population, and perch, suckers, and rock bass were also observed. The bottom was composed of sand, silt, and fine gravel. No sturgeon were captured here either.

If spawning occurred in 1958 the young sturgeon may have moved down into Black Lake earlier than the period of search in August. Their migration is quite possibly influenced by the fluctuations in water level caused by the power dams.

Other tributaries to these lakes are accessible to sturgeon for spawning, but it is unlikely that they are used. Bajkov (1930) found that sturgeon of the Lake Winnipeg region preferred spawning in about 10 feet of water over stony or gravelly bottom near rapids or waterfalls. Except for the Black River, tributaries to these lakes do not have these facilities to any extent. Sturgeon may also spawn occasionally in shallow water along lake shores. Residents along the eastern shore of Burt Lake report the rolling and jumping of sturgeon along that shore in the spring, which would indicate that this area might be the spawning ground of the Burt Lake population. However, since the lake shore

sites are probably not a preferred type of spawning area, this may be a factor causing the apparent wide difference in numbers of sturgeon in Black Lake as compared to Burt and Mullett lakes. In the latter lakes, few small fish were observed by fishermen in 1956-1958, the fishing quality was poorer (probably indicating fewer fish), and all sturgeon which were speared were of large size. In Black Lake numerous small sturgeon were observed, far more sturgeon were speared, and most of the sturgeon recorded were smaller in size. The age determinations made to date have not indicated that fish from Black Lake were growing more slowly than fish from Burt and Mullett lakes. It appears, therefore, that the population in Burt and Mullett lakes may be a remnant and that the rate of reproduction is extremely low, perhaps due to a lack of adequate spawning area. Unless the younger fish have gone consistently unobserved, this population may not be able to sustain a fishery, or even maintain its existence.

In contrast, the Black Lake population appears to be flourishing. Inasmuch as it has been isolated since 1903, and since numerous small sturgeon have been observed, reproduction must be relatively successful. Also, age determinations indicate that the fish which are now being speared must have hatched after the building of the Alverno Dam in 1903. Spawning conditions are apparently adequate, but with the present fishing pressure on the species, this population may not be able to maintain itself indefinitely.

If the sturgeon is to thrive in Michigan waters and continue to hold its position in the State's sport fishery, it needs close observation, supervision, and assistance. Consideration should be given to determining and applying management techniques to augment the present sturgeon population. Experiments

in artificial propagation of the species might be considered while mature fish are still accessible in Black Lake. Measures to preserve and improve the spawning area in the Black River may be in order. Purchase and transfer of young sturgeon from commercial fishermen in the Lake St. Clair and Potagannissing Bay areas might prove beneficial in assuring the sturgeon fishery's continued existence. A regulation enacted in 1959 that added the sturgeon to the game fish list and outlawed the buying or selling of sturgeon taken from inland waters should benefit the fishery. Possible considerations of a regulatory nature might include reduction of the season limit to one fish and the establishment of regulations requiring spearers to register their fish with prescribed authorities. A legal spearing season at 3- or 5-year intervals, rather than annually, may prove to be necessary to maintain a fishery but yet not deplete the population.

It is recommended that plans be made to tag as many sturgeon as possible in the Upper Black River, Cheboygan County, in the spring of 1961 to obtain information on growth and migration habits, and to allow some estimate to be made of the abundance of the Black Lake population by further creel census in February 1962.

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