

APPENDIX VIII

STATUS OF MAJOR SPECIES IN LAKE MICHIGAN

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Our resource assessment on Lake Michigan during 1975 focused on chubs, alewives, and yellow perch, and the results are reported here.

Chubs

While the states continued efforts to ban chub fishing on a lakewide basis, we observed little or no improvement in the severely depleted stocks during surveys in Michigan, Wisconsin, and Illinois waters.

Lakewide fall assessment surveys: Bottom trawl catches of adult chubs (age I and older) in the regular fall surveys were slightly larger than in 1974 but still far below those of 8 and 9 years ago at four southern index stations sampled each year since 1967 (Table 1, Fig. 1). Changes in the catches of adults at one southern location (Port Washington) and three northern locations (Frankfort, Manistique, and Sturgeon Bay) surveyed since 1973 were also small and without significant trend.

Young-of-the-year chubs, which mainly occupy midwaters above the depth range of bottom trawling, were less than half as available to trawls at the southern stations in 1975, as compared to 1974 (Table 1, Fig. 2). Catches of the young chubs were also smaller in 1975 off Port Washington, Frankfort, and Sturgeon Bay.

Special survey: Six widely distributed gillnet and trawl stations established in 1960-61 and revisited on several occasions in 1974, were sampled several times again during April-October, 1975. Sampling in 1975 was identical with that of the earlier years with respect to gear and depth, and nearly so with regard to dates. The catches in 1974 had shown that chub numbers then were only a small fraction of what they had been in 1960-61--less than 1% in western and northern parts. Results in 1975 indicated a further slight decline. Modest increases in 2- and 3-year old chubs were not enough to offset losses in older (commercial-sized) fish. The results of this special survey are somewhat at variance with those of the regular fall assessment (slight increase in some areas, little change in others). Perhaps the best conclusion is that the abundance of larger chubs has declined, but that the number of all sizes combined has not changed greatly.

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Table 1.--Number of adult (> 140 mm) and young-of-the-year chubs per bottom trawl transect ^{1/} at four index stations in Lake Michigan, late October-November 1967-75. [Either one or two transects (asterisk) were fished at each location.]

Life stage and location	1967	1968	1969	1970	1971	1972	1973	1974	1975
Adult									
Ludington	319	699*	542*	436*	403	220	264	78	93
Saugatuck	213*	303*	120*	139*	129	100*	22	33	43
Benton Harbor	411*	180*	151*	204*	226	89	46	39	73
Waukegan	594	631*	567*	484*	134*	35*	33	48	63
Mean	384	453	345	316	223	111	91	50	72
Mean ^{2/}	406	371	279	276	163	75	34	40	63
Young-of-the-year									
Ludington	5	14*	22*	28*	27	2	44 ^{3/}	137 ^{3/}	23 ^{3/}
Saugatuck	2*	15*	16*	30*	5	4*	52	15	7
Benton Harbor	10*	22*	20*	70*	11	1	14	24	7
Waukegan	17	60*	91*	72*	8*	3*	18	2	6
Mean	8	28	37	50	13	2	32	44	15

^{1/} The standard transect includes twelve 10-minute tows at depths of 3 (5 minutes only), 5, 7, 10, 12, 15, 17, 20, 25, 30, 35, and 40 fathoms; catches at 3 fathoms were adjusted to 10-minutes except for Ludington where the depth was not sampled.

^{2/} Ludington excluded.

^{3/} Numbers in missing tows at 7, 12, and 17 fathoms were estimated from adjacent tows.

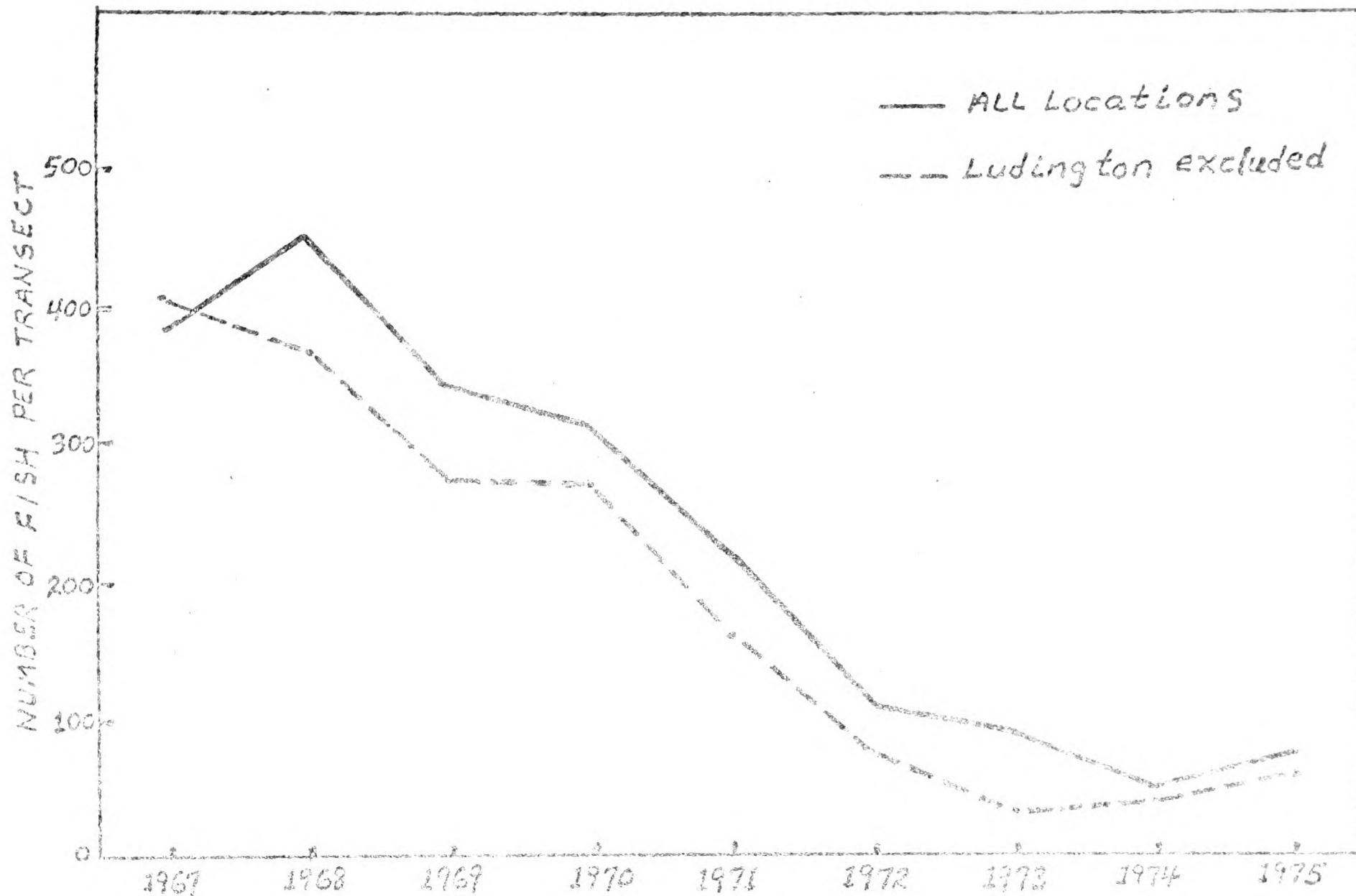


Fig. 1.--Changes in the availability of adult chubs to bottom trawls in southern Lake Michigan off Ludington, Saugatuck, and Boston Harbor, Michigan, and Waukegan, Illinois; late October and November, 1967-75.

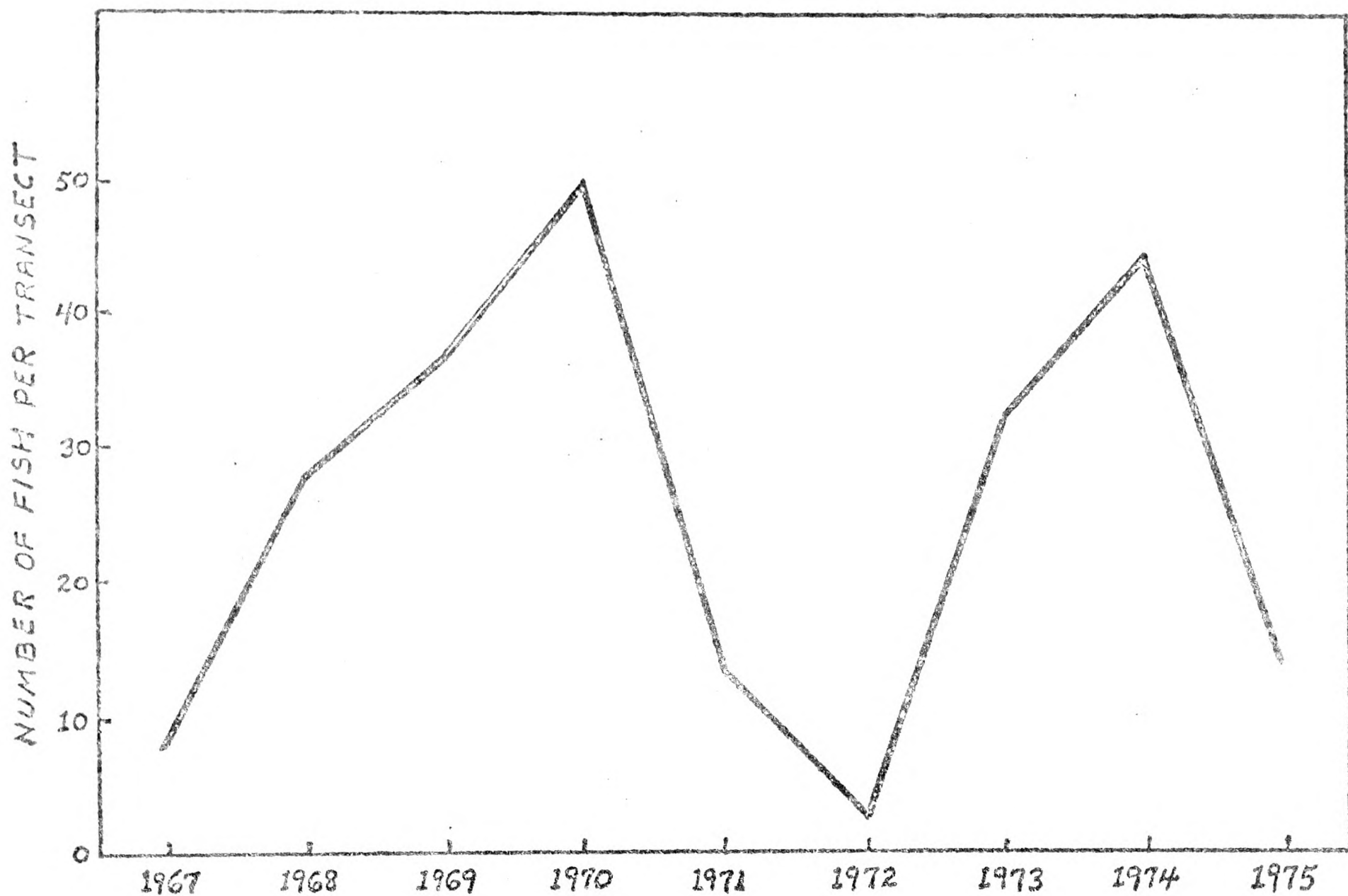


Fig. 2.--Changes in the availability of young-of-the-year chubs to bottom trawls in southern Lake Michigan off Ludington, Saugatuck, and Benton Harbor, Michigan, and Waukegan, Illinois; late October and November, 1967-75.

Commercial fishery: Although the latest commercial catch reports have not all been received from the states, it is evident from returns to date that Lake Michigan chub landings in 1975 were substantially below the 3.2 million pounds landed in 1974. This drop resulted collectively from a lower catch per unit of effort due to the diminished population and from the enactment of temporary bans on chub fishing during part of the year by the states.

As the fishing industry challenged both the legality of the temporary bans and efforts by the states to obtain permanent closures, we assisted state fishery administrators by technically appraising the status of the stock before fishery task forces in Wisconsin and Illinois, and later by testifying in circuit court at Chicago and before a Senate Committee at Madison, Wisconsin.

Alewives

Availability to trawls: Both adult and young-of-the-year alewives continue to be plentiful on the basis of our fall resource surveys with bottom trawls. The combined fall catch-rate for adult alewives at the four southern index stations (410 fish per tow) was the highest of the 9-year survey period because of record CPE's at Benton Harbor, Michigan (555 fish) and Waukegan, Illinois (861 fish) (Table 2). The combined CPE for young-of-the-year alewives was down from 1974 but still the third highest of the 9-year survey period. Considering the entire lake--northern as well as southern index stations--adult alewives were more available to bottom trawls in 1975 than in 1974 and the young were less available although by no means scarce. Despite considerable year-to-year variations at individual stations, the stock overall appears to have stabilized at a substantial level in recent years.

Physical condition relative to potential die-offs: During the laboratory's resource surveys in fall 1974, body-weight indices, which reflect the general physical condition of adult alewives, were at the lowest levels recorded for Lake Michigan since the huge population buildup that preceded the massive die-off in 1967. Because poor physical condition lessens the ability of alewives to withstand temperature stresses in winter and early spring, we predicted that a heavier die-off than in recent years might occur in 1975, even though the adult population appeared stabilized at a level of abundance far below the peak level of the mid-1960's. Moderately heavy concentrations of dead alewives were subsequently observed from research vessels along the east shore of the lake in spring 1975. A commercial fisherman in the Frankfort, Michigan area reported in late June that the die-off there was the largest he had seen in several years. By fall 1975, the physical condition of the adults had improved at all eight index stations lakewide, and we predict that die-offs in the spring of 1976 will be relatively light unless lake temperatures are unusually severe this winter.

Table 2.--Number of adult and young-of-the-year alewives per 10-minute trawl tow^{1/} at depths of 3-40 fathoms at four index stations in Lake Michigan, late October-November 1967-75. (Number of tows that took alewives in parentheses.)

Life stage and location	1967	1968	1969	1970	1971	1972	1973	1974	1975
Adult									
Ludington	79 (5)	93 (19)	198 (20)	361 (15)	122 (11)	126 (7)	904 (6)	330 (6)	83 (10)
Saugatuck	133 (21)	44 (22)	84 (20)	99 (21)	95 (12)	110 (19)	132 (12)	249 (8)	124 (11)
Benton Harbor	134 (23)	82 (24)	114 (23)	85 (23)	466 (12)	128 (13)	276 (10)	409 (8)	555 (8)
Waukegan	119 (11)	245 (24)	338 (24)	634 (24)	272 (24)	136 (24)	297 (12)	304 (12)	861 (12)
Mean	116	116	161	295	239	126	405	323	410
Young-of-year									
Ludington	62 (10)	549 (17)	257 (15)	590 (22)	764 (11)	155 (11)	401 (8)	2,790 (11)	1,398 (8)
Saugatuck	112 (22)	1,578 (18)	1,556 (20)	969 (23)	20 (10)	673 (21)	693 (9)	2,799 (10)	1,078 (9)
Benton Harbor	435 (20)	98 (18)	1,171 (19)	882 (17)	581 (7)	1,449 (10)	577 (7)	224 (9)	576 (8)
Waukegan	253 (11)	176 (17)	788 (24)	552 (21)	56 (10)	183 (20)	221 (6)	1,020 (12)	154 (5)
Mean	216	600	943	748	355	615	473	1,708	806

^{1/}Includes only tows that took alewives

Yellow Perch

Yellow perch catches in graded-mesh gill-nets fished during early July in shallow water along the eastern shore were light at Grand Haven, heavy at Saugatuck, South Haven, and Benton Harbor, and moderate at New Buffalo and Michigan City; along the western shore they were light at Indiana Shoals (southern Chicago), and extremely light at Wilmette (northern Chicago), Waukegan, and Milwaukee. (Table 3). Compared with 1974, catches were generally considerably larger along the eastern shore and smaller along the western shore. The greater catches in 1975 than in 1974 on the eastern side may not, however, represent an actual increase in abundance of perch. The nets in 1975 were set soon after the spawning season and caught large numbers of freshly-spent males, which apparently were still heavily concentrated in nearshore areas following spawning. Sampling in 1974 was not conducted until mid-July, well after the spawning season, and the males were not nearly so heavily concentrated in the shallow water. The continuing scarcity of yellow perch along the western shore suggests that the recovery of perch stocks there, such as occurred along the eastern shore several years ago, will not take place in the foreseeable future.

Perch were of considerably larger average size along the east shore from New Buffalo northward (State of Michigan waters) than along the more southerly and westerly shores (Indiana, Illinois, and Wisconsin). Fish longer than 8 inches comprised 75% of the catches in Michigan waters, as compared with only 21% in other states; those longer than 10 inches constituted 31 and 5%, respectively, of the catches in the two areas. The larger size of the perch in Michigan waters may result from less intense size-selective fishing. Commercial fishing for perch is banned in Michigan, but allowed in the other states.

Catches of young-of-the-year perch in our regular fall assessment with trawls were similar to those in 1974--moderate at Saugatuck and Benton Harbor, and nil at Waukegan, Port Washington, Sturgeon Bay, Manistique, and Frankfort. Reproduction in the southeastern part of the lake seems not to have been as good in the past several years as in 1968-70.

Table 3.--Numbers by size group of yellow perch in gillnets set overnight in various areas of southern Lake Michigan. (Numbers were calculated on the basis of 100 feet each of six mesh sizes. Actual length of mesh sizes in each set were: 1 1/2-25 feet; 2, 2 1/2, 2 3/4-50 feet each; 3, 3 1/2-100 feet each. Figures for each area represent combined catches from single sets at 3 and 6 fathoms.)

Locality	Total length in inches					Total
	<6.0	6.0-7.9	8.0-9.9	10.0-11.9	>11.9	
Grand Haven	4	109	18	9	3	143
Saugatuck	0	50	871	569	100	1,590
South Haven	2	377	349	214	54	996
Benton Harbor	6	289	535	142	22	994
New Buffalo	2	167	106	109	47	431
Michigan City	8	288	58	20	7	381
Indiana Shoals	0	168	28	1	0	197
Wilmette	0	18	14	0	0	32
Waukegan	0	0	0	0	0	0
Milwaukee	0	4	2	0	0	6