

APPENDIX VI[A]

Status of Major Species in Lake Michigan^{1/}

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Chubs

Continuing deterioration of the chub stock was indicated by our annual October and November resource surveys in Michigan, Wisconsin, and Illinois waters and by catch statistics from the commercial fishery. In addition, the severity of the long-term decline was substantiated by the results of a special lakewide gillnet and trawl survey conducted during April-October to compare present chub populations with those of 1960-61.

The combined catch of adult chubs (age I and older) in the regular fall surveys in the southern half of the lake dropped for the sixth consecutive year mainly because of a marked drop in the catch off Ludington, Michigan (Table 1, Fig. 1). An even greater drop in the catch off Frankfort, Michigan (data not shown) produced a similar decline in the combined catch-rate in northern Lake Michigan, where the resource surveys were extended for the second year in a row. As a result of the poorer catches in the Ludington-Frankfort region, we estimated a lakewide fishable biomass of only 5.4 million pounds of adult chubs in 1974 in comparison with 15 million pounds in 1973. This change is consistent with a drop in the catch rate for chubs in the commercial fishery and with indications from fishing reports received to date that 1974 landings were the poorest in 30 years.

Young-of-the-year chubs, which are not as vulnerable to trawls as the adults, were more plentiful at Ludington, Michigan than at any location sampled in southern Lake Michigan since 1967 (Table 1). The comparatively large catch at Ludington together with an increase in the catches at Benton Harbor contributed to the second highest CPE of YOY's in the 8-year (1967-74) survey period (Fig. 2). The value of these CPE's as indices of future recruitment to adult stock is uncertain, however, because the peak 1970 catch of young chubs has not been reflected in improved catches of adults in succeeding years.

The special gillnet and trawl survey which was identical to one carried out experimentally in 1960-61 with respect to gear and depth and nearly so with respect to dates, showed that a precipitous decline in the chub population has occurred lakewide. Abundance appeared to be less than 1% of the 1960-61 levels in the western and northern parts of the lake and 2 to 8% in the eastern portion. Average weight of individual chubs in all parts of the lake was about twice what it had been in 1960-61.

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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 1967-74. (Either one (asterisk) or two transects were fished at each location.)

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

^{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 that depth was not sampled.

^{2/} Ludington excluded.

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

Alewives

The availability of adult alewives to bottom crawls during our lakewide assessment surveys, and complementary echotracings of midwater concentrations, indicate continued population stability in the presence of large standing stocks of lake trout and salmon. A moderate dip in the combined catch-rate for adults at the main southern index stations reflected a sharp drop in availability to bottom gear off Ludington (Table 2). In contrast to the unusually tight distribution near the bottom at that station and off Frankfort 50 miles to the north in 1973, alewives were scattered more at mid-levels from Ludington north in 1974. As a result, our estimate of a fishable biomass of 190 million pounds of alewives for the lake in 1974 was moderately lower than the 1973 estimate of 220 million pounds.

Good reproduction in 1974, represented by 1,708 young-of-the-year alewives per trawl tow at the southern stations (the 8-year average was 707 per tow--see table 2), is additional evidence that alewives are "holding their own" against substantial predation by the salmonids and exploitation by an industrial fishery that had record landings of more than 42 million pounds in 1974.

Yellow perch

The population increase of yellow perch that has occurred along the east shore since the precipitous decline of the mid-1960's still has failed to materialize along the west shore. Graded-mesh gillnets set during July 17-31 in shallow water at several localities along the east shore from Saugatuck to Michigan City took large numbers of perch except at Michigan City where catches were moderate; identical sets in the same time period along the west shore at Waukegan and Milwaukee made only small catches (Table 3). The population in general did not appear to be greatly different than in 1973. The perch along the east shore, particularly at New Buffalo, included good numbers of very large individuals (Table 3)--some over 14 inches long and weighing more than a pound. Age groups III-V were best represented at most localities.

Catches of young-of-the-year perch in fall index sampling with trawls were moderate at Saugatuck, small at Benton Harbor, and nil at Waukegan, Port Washington, Sturgeon Bay, Manistique, Frankfort, and Ludington. Reproduction appears to have been much less successful in 1974 than in 1968-70 in the southeastern part of the lake.

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 1967-74. (Number of tows that took alewives in parentheses.)

Life stage and location	1967	1968	1969	1970	1971	1972	1973	1974
Adult								
Ludington	79 (5)	93 (19)	198 (20)	361 (15)	122 (11)	126 (7)	904 (6)	330 (6)
Saugatuck	133 (21)	44 (22)	84 (20)	99 (21)	95 (12)	110 (19)	132 (12)	249 (8)
Benton Harbor	134 (23)	82 (24)	114 (23)	85 (23)	466 (12)	128 (13)	276 (10)	409 (8)
Waukegan	119 (11)	245 (24)	338 (24)	634 (24)	272 (24)	136 (24)	307 (12)	304 (12)
Mean	116	116	184	295	239	126	405	323
Young-of-year								
Ludington	62 (10)	549 (17)	257 (15)	590 (22)	764 (11)	155 (11)	401 (8)	2,790 (11)
Saugatuck	112 (22)	1,578 (18)	1,556 (20)	969 (23)	20 (10)	673 (21)	693 (9)	2,799 (10)
Benton Harbor	435 (20)	98 (18)	1,171 (19)	882 (17)	581 (7)	1,449 (10)	577 (7)	224 (9)
Waukegan	253 (11)	176 (17)	788 (24)	552 (21)	56 (10)	183 (20)	221 (6)	1,020 (12)
Mean	216	600	943	748	355	615	473	1,708

^{1/} Includes only tows that took alewives.

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 300 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 1/2-300 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	
Saugatuck (2 mi. S)	0	6	388	654	180	1,228
Saugatuck (10 mi. S)	0	61	510	403	124	1,098
South Haven (Piers)	0	90	1,351	528	62	2,031
South Haven (Palisades P. P.)	12	78	992	504	75	1,661
Benton Harbor (Piers)	0	42	612	291	17	962
Benton Harbor (Cook P. P.)	0	270	535	526	64	1,395
New Buffalo (3 mi. NE)	0	366	723	557	319	1,965
Michigan City (Piers)	36	240	182	180	18	656
Michigan City (Black Ditch)	0	324	240	111	14	689
Waukegan (Piers)	12	6	12	0	0	30
Milwaukee (Piers)	0	6	66	1	1	74

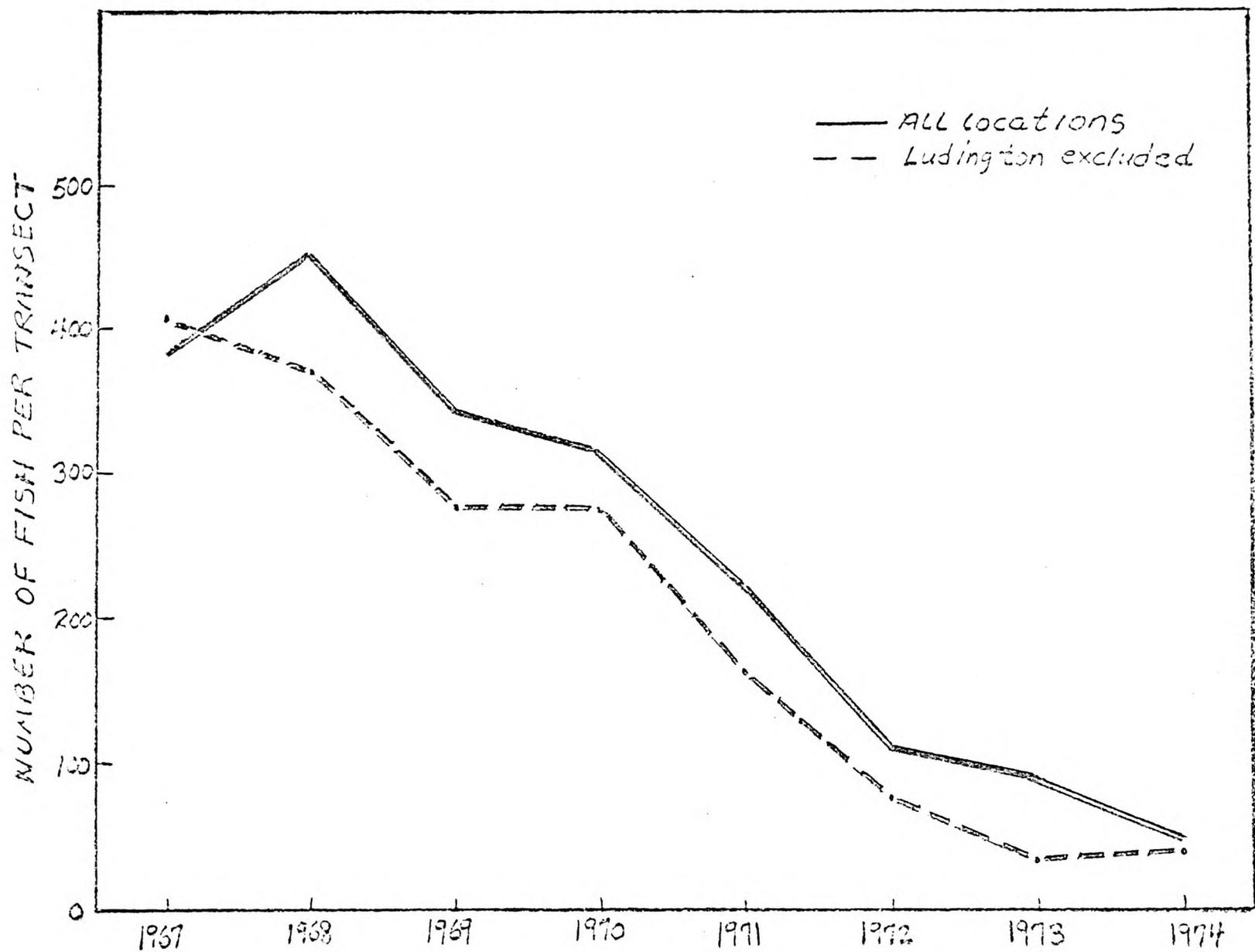


Fig. 1.--Changes in the availability of adult chubs to bottom trawls in southern Lake Michigan off Ludington, Saugatuck, and Benton Harbor, Michigan, and Waukegan, Illinois, late October and November, 1967-74.

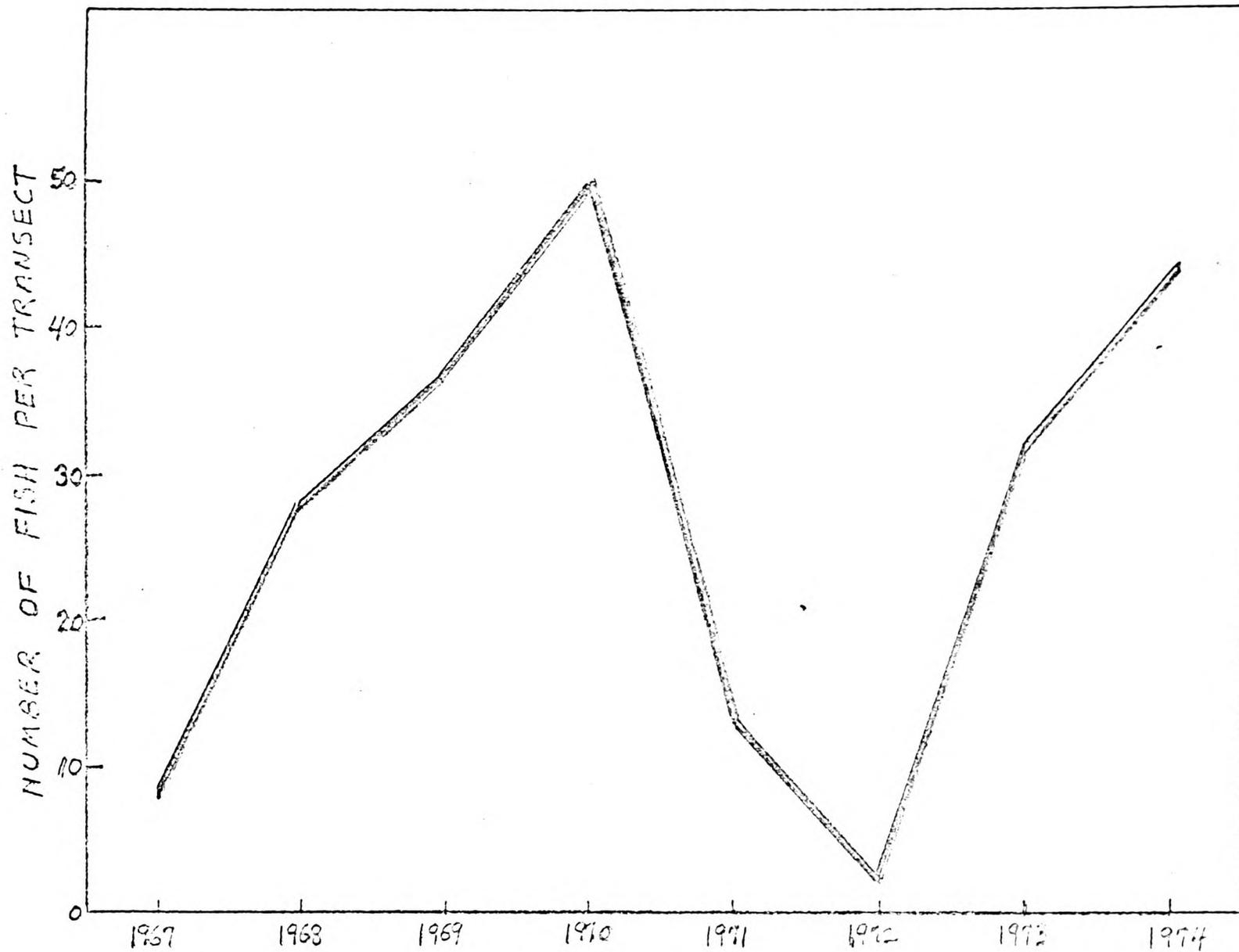


Fig. 2.--Changes in the availability of young-of-year chubs to bottom trawls in southern Lake Michigan off Ludington, Saugatuck, and Benton Harbor, Michigan, and Waukegan, Illinois, late October and November, 1967-74.