

Status of Alewives and Yellow Perch in Lake Michigan<sup>1/</sup>

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Alewives

Index catches of adult alewives during our regular fall bottom trawl survey decreased at three stations, increased at two, and remained about the same at two (Table 1). The average catch per tow for all stations combined (177) was somewhat lower than in 1976 (194) and down considerably from 1975 (406). However, consecutive decreases in the last two years do not necessarily indicate that Lake Michigan alewife populations have entered into a long-term downward trend. Catches in fall index sampling have fluctuated considerably since 1970, but without development of a trend. Nevertheless, a further decrease in 1978, particularly a substantial one, would be cause for some concern.

Unless alewife abundance declined more in 1977 than our fall surveys indicated, the severe winter of 1976-77 did not seriously reduce alewife populations--as we had earlier (a year ago) speculated it might. Laboratory experiments have shown that alewives are not able to tolerate as cold water as our native Great Lakes species; and some field evidence suggests that winter temperatures may at times be low enough to stress alewives to the extent that they suffer heavy winter and/or spring dieoffs.

Although limited observations suggest that the winter dieoff of 1976-77 was the largest in Lake Michigan in several years--perhaps the largest since 1966-67--spring mortality did not appear particularly heavy on a lakewide basis. Our assessment of the winter dieoff is based on catches of dead alewives in early spring trawling at depths of 60, 70, and 80 fathoms off Saugatuck. In 1977 we took 144 dead alewives, compared with only 0-25 for the years 1971-76, and 87 in 1970, the first year of sampling. Spring mortality evidently was much heavier than normal only in the southwestern and west central parts of the lake, from about Chicago to Port Washington; it ranged from very light to moderate in other parts of the lake. The events of the past year suggest that although winters colder than normal can cause increased winter mortality, they (at least acting alone) would rarely be a factor in causing serious declines in alewife abundance in Lake Michigan.

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Table 1. Average numbers of adult alewives per 10-minute tow at eight index stations. (Tows at each station were made at 5-fathom intervals from 10 to 50 fathoms.)

Location	1973	1974	1975	1976	1977
Benton Harbor	413	458	492	113	117
Saugatuck	243	391	173	127	141
Ludington	784	360	128	274	103
Frankfort	1669	44	1244	229	123
Manistique	73	11	121	217	315
Sturgeon Bay	187	174	113	138	205
Port Washington	143	299	378	-*	197
Waukegan	441	567	999	360	212
Average (stations combined)	494	288	406	194	177

\*Not sampled.

#### Yellow perch

Catches of yellow perch in graded-mesh gillnets fished in July in State of Michigan waters were large at two Saugatuck stations (the reef, and 8 miles south of the reef) and at South Haven, moderate at Grand Haven and Benton Harbor, and small at New Buffalo. Proceeding westward, in Indiana they were small at Michigan City and extremely small at Indiana Harbor. In Illinois they were extremely small at Lake Bluff (Table 2). The catches, compared with 1976, were considerably larger at one of the Saugatuck stations (the reef), considerably lower at all stations from Benton Harbor around the south end of the lake to Lake Bluff, and about the same at other stations. Large perch made up a much greater portion of the catches in Michigan than in Indiana and Illinois. Fish more than 10 inches long constituted 59% of the total in Michigan, but only 1% in the other states. Large fish were particularly prominent in catches from the reef near Saugatuck, where 79% were over 10 inches long and 33% were over 12 inches long.

The marked declines in catches at stations in the extreme southern part of the lake probably were related more to atypical distributions than to actual decreases in abundance. Thermal conditions were highly unusual last summer. The warm upper level was very thin all summer, and cold hypolimnial waters often extended into shallower areas than normal during the summer. Water temperatures at standard sampling depths (3, 6, and 9 fathoms) at the most southerly stations were generally well below those preferred by perch, and as a result most perch were probably concentrated in warmer waters at depths shallower than those fished. Thermal conditions were essentially unchanged when we repeated the sampling at several of the stations in August. The catches were slightly higher than in July at Benton Harbor and New Buffalo, and slightly lower at Michigan City. We suspect that in both months the catches at the southern stations underrepresented perch abundance.

In an interagency effort with the Michigan DNR, we combined data collected by our laboratory in 1971-76 with information gathered by the MDNR in 1968-73 for computation of an estimated total allowable harvest of perch for Michigan Statistical District 8 (State of Michigan waters south of Holland). We arrived at a rather modest figure of 220,000 pounds for 1977. Although this estimated allowable harvest probably represented a conservative appraisal of actual surplus production, the figure serves to suggest that a cautious approach should be taken should quotas be set for utilization of perch in Lake Michigan.

Table 2. Length-frequency distribution of yellow perch in gillnets set overnight in various areas of southern Lake Michigan in July 1977. (Numbers are projected from catches in 100 feet each of five mesh sizes. Actual amount of netting, by mesh size, in each set was: 2, 2-1/2, and 3 inch--50 feet each; and 3 and 3-1/2 inch--100 feet each.) Figures for each area represent combined catches from single sets at 3, 6, and 9 fathoms. (Table of all sizes of perch combined taken in similar sampling in 1976 shown in parentheses.)

Locality	Total length in inches					Total	
	<6.0	6.0-7.9	8.0-9.9	10.0-11.9	>11.9		
Grand Haven	0	30	52	82	19	183	(181)
Saugatuck (reef)	0	23	198	441	319	981	(442)
Saugatuck (8 mi S. reef)	0	30	222	182	77	511	(403)
South Haven	3	29	345	214	25	616	(535)
Benton Harbor	0	10	72	54	9	145	(599)
New Buffalo	0	6	18	43	18	85	(583)
Michigan City	0	18	70	1	0	89	(129)
Indiana Harbor	0	2	4	0	0	6	(130)
Lake Bluff	0	4	10	0	0	14	(60)