APPENDIX VII

Agenda Item V
Lake Michigan Committee Meeting

Status of Alewives and Yellow Perch in Lake Michigan[1]

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Alewives

Catches of adult alewives during our regular standard bottom trawl surveys declined at four index stations and increased at three (Table 1). The catch rate for all stations combined (194 fish per tow) was down substantially from 1975 (406 fish), due in considerable part to striking declines at Frankfort and Waukegan. A large part of the differences in the catches between the two years may have been due simply to sampling error. Shifts in vertical distribution of alewives, for example, could cause changes in bottom trawl catches without regard to population changes. In any case, the drop in combined catches from 1975 to 1976 should be no cause for concern. Catches in the fall index sampling have fluctuated considerably since 1970, but no trends have developed. Until a trend does become apparent, it is perhaps safe to assume that the populations are more or less stable. Next year we plan to present the alewife abundance data in terms of biomass and annual production.

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 10-50 fathoms.)

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

*Not sampled.

[1]Presented at: Great Lakes Fishery Commission
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The extreme severity of the present winter has caused apprehension that the alewife dieoff in Lake Michigan will be heavy this year. 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 in the Great Lakes may at times be low enough to stress alewives. However, conclusive evidence is lacking that the deep wintering grounds of alewives in Lake Michigan are ever cold enough to cause mortality. The present unusually cold winter should provide an excellent opportunity to assess the importance of winter water temperatures as a factor in determining the magnitude of the dieoff the following spring. If the dieoff this year is not at least somewhat heavier than in the past several years, then we can probably assume that winter temperatures in Lake Michigan would rarely if ever be cold enough to influence alewife mortality. A heavy dieoff this year should, on the other hand, provide reasonably good evidence that winter temperatures are important. Other factors could be involved in a heavy mortality, but at least one--poor pre-winter physical condition of alewives--can be ruled out. Body weight indices last fall, although down from the previous year, were not at levels low enough to suggest that the alewives were in very poor condition.

Chances for a heavy dieoff seem greater this year than in any year since 1967, but we make that statement with considerable reservation. The likelihood of a dieoff as severe as the one that occurred in 1967 seems remote in any event, inasmuch as populations are lower now.

Yellow Perch

Catches of yellow perch in graded-mesh gillnets fished during July in State of Michigan waters were considerably larger at Saugatuck, South Haven, Benton Harbor, and New Buffalo than at Grand Haven; catches in Indiana at Michigan City and Indiana Harbor were lower than at Grand Haven; and catches in Illinois at Lake Bluff (5 miles south of Waukegan) were smallest of all (Table 2). Although catches were somewhat larger in 1976 than in 1975 at Grand Haven and New Buffalo, they were substantially smaller in the other areas. (Lake Bluff was not sampled in 1975.) The diminished catches may not, however, represent a decline in abundance, because in 1975 perch were probably caught in disproportionately large numbers. Sampling in 1975 was conducted soon after the unusually late spawning season, and at some stations the net caught large numbers of freshly spent males still concentrated on spawning grounds. Spawning occurred at a more nearly normal time in 1976, and sampling areas were free of spawning concentrations during the survey.

As has been the case for the past several years, yellow perch in the catches tended to be larger in State of Michigan waters than in Indiana and Illinois waters (Table 2). Fish larger than 203 mm (8.0 inches) made up 77 percent of the catches in Michigan as compared with only 45 percent in Indiana/Illinois; those larger than 305 mm (12.0 inches) constituted 13 percent of the catches in Michigan waters and only 1 percent in Indiana/Illinois. Preliminary analysis of age and growth shows that the larger size of perch in State of Michigan waters resulted from a greater proportion of fish older than age III in the catches there than in Indiana/Illinois. The relative scarcity of larger perch in Indiana/Illinois might be the result of selective cropping by the commercial fisheries in those states. Commercial fishing has been banned in State of Michigan waters of Lake Michigan since 1970.

Yellow perch were also sampled with gillnets in May and September in a joint effort with the Michigan DNR to gather information necessary for estimating biomass levels and surplus allowable harvest in the area from Grand Haven to the Michigan-Indiana boundary. Considerable progress has been made toward analyzing the nearly 3,000 samples collected for this project, but summarizations of age structure, mortality, etc., are not yet possible.

Catches of young-of-the-year perch in our regular fall trawl survey were not very different than in the past several years. A few young were taken at Saugatuck and Benton Harbor, but none were caught at Waukegan, Sturgeon Bay, Manistique, Frankfort, or Ludington. Reproduction in southeastern Lake Michigan in recent years appears to be less than that of 1968-70, but probably is better than in the early 1960's.

Table 2. Length-frequency distribution of yellow perch in gillnets set overnight in various areas of southern Lake Michigan. (Numbers are projected from catches in 30 m each of five mesh sizes. Actual amount of netting, by mesh size, in each set was: 5.1, 6.4, and 7.0 cm--15 m each; and 7.6 and 8.9 cm--30 m each.) Figures for each area represent combined catches from single sets at 5.5, 11.0, and 16.5 meters.

Locality	Total length, mm and (in parentheses) inches					Total
	<152 (<6.0)	152-202 (6.0-7.9)	203-253 (8.0-9.9)	254-304 (10.0-11.9)	>304 (>11.9)	
Grand Haven	0	18	56	69	38	181
Saugatuck (Reef)	0	16	122	171	133	442
Saugatuck (2 Mi. S. Reef)	0	20	108	178	97	403
South Haven	0	165	228	95	47	535
Benton Harbor	6	190	318	75	10	599
New Buffalo	2	212	252	74	43	583
Michigan City	0	60	56	11	2	129
Indiana Harbor	0	84	46	0	0	130
Lake Bluff	0	33	27	0	0	60