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STUDIES ON MERGANSER DEPREDATIONS IN MICHIGAN TROUT WATERS

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This paper is a report on findings obtained from an analysis of the stomach contents of ninety-eight American Mergansers and two Red-breasted Mergansers, collected during the late winter of 1936 in pursuance of the Merganser Control Program of the Michigan Department of Conservation.

It is generally agreed that mergansers seldom concentrate heavily on trout streams except when severe cold prevails, and ice formation drives them from their preferred feeding areas in the bays and estuaries of the Great Lakes and the larger inland lakes. Michigan's present merganser policy recommends that control measures be adopted when census work reveals a concentration of more than twenty-five mergansers per mile of stream. Such control is customarily exercised by Conservation Officers.

The authors devoted some time during January, February and March, 1936 to stream patrol in various sections of the northern part of the lower peninsula, with a view to determining centers of merganser concentration. These field observations, coupled with distributional data afforded by collections made by Conservation Officers, indicate that the large rivers support a much heavier concentration of mergansers than do the small, fast trout streams. An exception to this is offered by the Platte River, in Benzie County, where the largest single collection of recovered ducks was made. This case may well be explained by the fact that the collection was made at a point within fifteen miles of Lake Michigan. Most of the trout water patrolled by the writers in the central part of the state contained less than six mergansers per mile. These observations lead to the conclusion that when ice formation drives mergansers from the lakes they tend to settle on the first suitable open water to present itself, with the result that streams in the middle of the state are affected much less than those near the lakes. While the majority of the trout water is likely to be relatively free from mergansers, there may exist local areas of dangerous concentration.

On most of the streams which remained at least partly open, American Golden-eyes were present in large numbers. Previous work done by the Institute (unpublished) has shown that the diet of the American Golden-eye under such circumstances is made up almost wholly of roots of submerged vegetation, and of crayfish, insect larvae, and snails.

Of the 100 stomachs examined, fifty-six contained trout; thirty-three had eaten trout exclusively. The average number of trout for each of

TABLE 1.* ANALYSIS OF MERGANSER STOMACH CONTENTS

	Brown Trout	Rainbow Trout	Brook Trout	Trout sp.	Suckers	Perch	Black Bass	Other Fish	Crayfish	Frogs	Insects	Debris
Number of birds containing	20	21	8	11	6	9	1	27	18	4	5	21
Average length in inches (to nearest 0.1 inch)	8.6	6.0	6.2	4.1	4.4	2.8	4.0	2.5				
Average number per stomach	0.48	0.64	0.09	0.15	0.19	0.39	0.05	0.61	0.20	0.04	0.06	
Per cent. of total contents based on measured volume	47.4	22.5	4.9	2.8	8.8	3.3	1.0	5.1	2.1	0.8	0.4	0.9

* **Explanation of table:** All figures based on analysis of 100 stomachs, 98 of American Merganser, 2 of Red-breasted Merganser. Under the heading "suckers" are included 18 Common Suckers (C. commersonnii), and 1 Red-horse, (Moxostoma sp.). Under the heading "other fish" are included lamprey ammocoete, Rock Bass, Common Sunfish, Log Perch, Black-sided Darter, Menona Killifish, Black-nosed Dace, Lake Emerald Shiner, various unidentifiable minnows of the genus Notropis, Mud Minnow and Muddler. The insects include 2 phryganeid caddis larvae, a giant water bug (Lethocerus), and 3 dytiscid beetles. The frogs are apparently all the green frog, Rana clamitans. We wish to express our thanks to our colleague in the Institute, Mr. Gerald P. Cooper, for determination of the non-game fish.

TABLE 2. DISTRIBUTION OF MERGANSER COLLECTIONS, TROUT AND NON-TROUT WATERS

Date (1936)	Locality	Trout or Non-trout	Number of Mergansers	No. containing trout
Feb. 17-Mar. 8	Platte River Benzie County	Trout	36	28
Feb. 21-Mar. 1	Boardman River, Grand Traverse County	Trout	13	4
Feb. 26-29	South Branch Au Sable River, Crawford County	Trout	9	8
Feb. 24-Mar. 17	West Arm of Grand Traverse Bay, Grand Traverse County	Non-trout	7	0
Feb. 23-25	Muskegon River, Newaygo County	Trout	5	1
Feb. 18-25	Baldwin Creek, Lake County	Trout	5	2
Feb. 17-Mar. 19	Big Betsie River, Benzie County	Trout	4	1
Feb. 22	East Branch Big Creek, Oscoda County	Trout	4	3
Feb. 23	Main Stream of Au Sable River, Oscoda County	Trout	3	2
Feb. 19-Mar. 21	North Branch Au Sable River, Crawford County	Trout	3	1
Feb. 23	Middle Branch River, Osceola County	Trout	3	1
Feb. 27-29	Hatchery, Van Buren County	Trout	2	2
Feb. 21	White River, Newaygo County	Trout	2	0
Feb. 28-Mar. 1	Houghton Lake, Roscommon County	Non-trout	2	0
Feb. 29	Hatchery, Marquette County	Trout	1	1
Feb. 29	Pine River, Wexford County	Trout	1	0

the fifty-six stomachs was approximately 2.4. From Table 2, it may be seen that nine of the ducks were taken on non-trout water. Considering only those taken on trout water the percentage containing trout of all species becomes 61.04, almost two-thirds of the total. In certain instances the figure will be seen to be much higher.

It may be of interest to mention that during the peak of the merganser concentration the authors carried on extensive seining operations in the North Branch of the Au Sable, and secured almost no trout, although considerable numbers of Black-nosed Dace, Horned Dace and Muddlers were taken.

It should be borne in mind that the period of heavy merganser concentration on trout streams seldom exceeds thirty days. However, although the figures listed above would have more significance were more known about the merganser's rate of digestion, they do strongly hint that occasional local centers of merganser abundance may reach a strength definitely harmful to the trout population.

Discussion

Dr. Vladykov: I examined twenty-three stomachs of merganser from Nova Scotia. Eight stomachs from the Margaree River contained salmon parr. In other stomachs we found yellow perch, common sucker, and lake chub. In two stomachs of golden-eye only insect larvae were present. The golden-eye stomachs were taken from birds killed during the winter months.

Mr. Adams: What species of merganser do you make reference to?

Dr. Leonard: Ninety-eight American mergansers and two red-breasted mergansers.

Mr. Adams: What about the hooded merganser?

Dr. Leonard: The hooded merganser seldom appears on the trout streams. We find it on lakes in the southern part of Michigan but coming on a little later than this heavy concentration of Americans and red-breasted. I may say that a good many people confuse immatures and females of the American merganser with the red-breasted. This shows that the red-breasted is really very rare, particularly in Michigan in winter. We have had considerable experience with mergansers at the fish hatchery at Oden. From my experience with the mergansers I would say that if there is one per mile of trout stream there is just one too many.