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AN INDEX TO THE FOOD HABITS OF THE AMERICAN MERGANSER ON
MICHIGAN TROUT STREAMS AND OTHER WATERS

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For three years prior to this winter season, the Institute for Fisheries Research has been engaged in accumulating a series of merganser stomach specimens from various types of streams and lakes in Michigan, as a part of the investigation of fish predators being conducted for the State Department of Conservation. From time to time, cooperation in this has been solicited from various other agencies, and was chiefly responded to by the Department's Field Administration Division, and the Kellogg Bird Sanctuary. The greater portion of the more critical material was collected personally by the investigator or by Conservation officers under his directions. Up to this date, 150 specimens have been taken and analyzed. This number seems sufficient to indicate the severity of the merganser's food habits with reference to the State's fishing resources, and in one section seems to indicate a destruction of trout sufficiently serious to conclude that the American merganser is locally a factor of importance in depleting the fish supply.

The situations frequented by the American mergansers in Michigan may be definitely divided into three main geographical areas: (1) The Great Lakes Region, with the attendant bays and river mouths, (2) The trout stream country of the upper and lower peninsulas, and (3) The lakes and streams of Southern Michigan from the Tittabawassee and Grand Rivers south. The feeding habits of the bird will be detailed with reference to each of these regions separately as its effects on the fishing are correspondingly different in each of these regions.

The trout stream area. Stomachs from this area in general show that in the upper

reaches of our better trout streams such as the Au Sable and its branches, the Big and Little Manistee, the Jordan, the Sturgeon, and Black Rivers, and other streams of that area, the food of the merganser is more than 70% trout. By "upper reaches" ~~is~~ meant the portion of the streams which is available to fly-fishing by a man in waders. Downstream from the headwaters, where the water begins to average four feet deep, other and less important species of fishes commence to take correspondingly larger places on the merganser's diet and dilute the trout below the point where the merganser is an important factor in the trout fishing sport. I am confident, however, that under certain weather conditions in certain years, the American merganser is a very important, if not a determining factor, in the ensuing season's fishing returns.

This was very strikingly borne out on the North Branch of the Au Sable this past season. It has been almost universally claimed that fishing on this stream for this year did not nearly come up to its usual standard of productivity, and the same feature was to be observed on all other areas or streams on which heavy merganser concentration occurred last winter. While definite proof is not available, it seems reasonably sure that the trout supply in the streams has suffered a marked depletion in recent years. The large percentage of trout in the stomachs of mergansers shot in these areas does not necessarily show that the merganser selects specifically a trout diet. The preponderance of trout in the merganser's diet in this area is undoubtedly due to the fact that the trout in the headwater region are the most abundant fish in the stream (as is true of all good trout streams), and are of a size most susceptible to the merganser's needs; namely, from five to fifteen inches in length. This view is supported by the manner in which commoner fishes appear in the merganser's ~~stomach~~ further downstream.

The greatest depredations undoubtedly occur ^{those} ~~in such~~ years in which the shallow bays of the Great Lakes and the mouths of the larger rivers entering these lakes freeze over early and remain frozen until late in the spring. At such times, the mergansers are driven inland to the trout water, although normally they prefer to winter on these Great Lakes bays. When this movement occurs, concentrations varying from 50 to 500 birds per mile are the rule, not the exception. It is at such times and places only, that control measures may be expected to be of real importance in maintaining the fish

supply. When birds are scarcer than 25 to 50 per mile of stream, it is doubtful if control measures would "pay". The most effective season for control in the region involving the Au Sable, the Manistee, and the Boardman Rivers would be from the 15th of February to the last of March, with seasonal fluctuations of the date limits in one direction or the other. The Jordan, Sturgeon, and Pigeon Rivers are affected by merganser concentrations somewhat later — from about the middle of March until the middle of April. In the Upper Peninsula, the more important regions where control would likely be needed and effective are the drainages of the Taq^{ua}ammonon, Manistique, and adjacent rivers, and the time interval would be from mid-April to mid-May. Other regions of the Upper Peninsula are relatively free from merganser concentrations.

By field activities, the writer has demonstrated to his own satisfaction that it is perfectly possible to break up the merganser concentrations on the headwater streams and to drive the birds downstream to water of an average depth of four feet or deeper, where their feeding activities are no longer seriously detrimental to the trout fishing.

In response to a request from the Game Division for suggestions as to control procedure, I would recommend that small groups of wardens only, under the strict supervision of a field administration supervisor, and preferably a member of either the Game Division or the Fish Division compose the party. The maximum party should not be larger than eight; and a minimum party of four, with a supervisor, will often do much good. The men should work in groups of two, one on each side of the stream, and should gradually converge upon each other; that is, a party of two should start downstream from a given point, and a party of two should start upstream some three or four miles from below, and gradually work toward each other. In this manner, they will cause the birds to cross the line of fire several times.

Field experience has shown that this patrol instituted twice a week in the early part of the season's concentration period, and later decreased to once a week, can be expected to effect the control desired.

It is suggested that all birds shot be saved for stomach analysis. In line with this, it is suggested that ⁽¹⁾all mergansers dropped in one firing should be retrieved im-

mediately as they have a pronounced tendency to regurgitate the larger fish they have swallowed if not killed outright.

(2). The throats of the birds should be closed to further prevent a loss of contents of the gullet by placing a strong rubber band or string around the throat immediately behind the head.

(3). All birds shot should be kept in a cold situation until they can be expressed either to the Institute for Fisheries Research at Ann Arbor, Michigan, or to the Game Division, Department of Conservation, at Lansing, Michigan.

(4). Shipment should be made without undue delay.

Since this research has indicated that goldeneyes and scaups are relatively unimportant so far as their feeding activities relate to game fish, there seems to be no occasion for shooting these species on the trout stream patrols. The food of these ducks, as determined from specimens taken on the same days as were the merganser specimens, principally consists of ordinary trout-stream insects, with an occasional small minnow and very rarely small fingerling trout. This also applies to the old squaw, with a reservation that small fish are more prevalent in its diet. But this duck is never sufficiently numerous on trout streams to cause any anxiety as to its food habits. If or when any of these other species are accidentally or unavoidably shot, however, the specimens should also be sent in for study.

It may be re-emphasized that it is only on water averaging less than four feet deep that the merganser appears to be ^a serious factor on trout streams. Below this demarcation line, coarse fish and centrarchids loom largely in the diet, although an occasional trout is found.

Great Lakes and river mouth region. The food of the merganser in these areas need cause no concern. It is largely composed of minnows, suckers, sunfish, perch, darters, and an occasional pike, bass and coregonid. The immense water areas obtained here spread their fishing activities so that no one region is adversely affected by their concentrations. Further, there is some indication that in this region, the birds are very active in taking diseased individuals.

Streams and lakes of Southern Michigan. In this connection, it may be noted that many of the rivers and lakes of this region are overpopulated by members of the sunfish group, particularly by small species or dwarfed populations. Or Rock Bass may predominate in waters where Smallmouthed Bass might prosper better if Rock Bass competition were removed. In the Huron River above Ann Arbor, for example, Rock Bass abound. Consequently, one would expect to find Rock Bass predominating in the merganser's diet in this region, and investigation shows that this is the true situation. Any factors which will reduce the less desired sunfish may improve fishing in the southern region. This is exactly what the merganser often accomplishes. At present, considering these and other facts, it does not appear probable that the merganser is a serious factor in the depletion of game fishes in the southern district.

Food habits of the red-breasted and hooded merganser. In Michigan, the red-breasted merganser migrates chiefly along the Great Lakes shores and bays, with occasional appearances on the larger inland lakes. It winters to some extent on the lakes of Southern Michigan. Its food habits on these areas need cause no active concern as a threat to the success of the fisheries.

Regarding the attractive hooded merganser, our research has shown it to feed almost entirely upon crayfish and thin-shelled mussels, along with some of the abundant insect material from the surface and stream bottom and an occasional small fish for good measure.

To summarize, of the seven species of ducks frequenting Michigan waters which habitually include fish in their diet, the American Merganser is the only species whose control may be expected to have any marked effect upon the production of game fishes. Further, the control of this species will probably be effective only in the upper regions of the largest and best trout streams.

It is presupposed that before undertaking this control program, the Conservation Department will make the proper contact with the Bureau of Biological Survey.