

FOOD HABITS OF THE HERRING GULL IN RELATION
TO FRESH-WATER GAME FISHES IN MAINE¹

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THIS discussion of the summer food of the Herring Gull (*Larus argentatus*) is based on the analyses of the stomach contents of 62 birds from the inland waters of Maine. Special attention has been paid to the relationship between the gull and the game fishes of the State. The collecting of specimens was supplemented by field studies on the feeding habits of the birds, their populations, and the abundance of available food. The stomach analyses and tabulations were largely made by the writer. G. P. Cooper, Ichthyologist in the Zoology Department, University of Maine, assisted in identifying fish material and staff members in the Zoology and Botany Departments helped in the identification of other food items. Tabulation was of dry material and was made according to the percentage-by-bulk method as recommended by the Bureau of Biological Survey. In addition to the stomachs, a few pellets of regurgitated food were obtained from Moosehead Lake. The results obtained by analyzing these are discussed in the report but are not tabulated, as the pellets were taken chiefly from one locality and were a selective collection; consequently, although having a certain degree of interest, they do not represent typical cases.

Of the 62 stomachs collected, 12 were empty or unfit for percentage tabulation. A summary of the food items in the remaining 50 is given in Table 1.

TABLE 1. FOOD OF HERRING GULLS FROM INLAND LAKES, MAINE,
JUNE-SEPTEMBER 1936-1937

	Percentage of total	Percentage of total
FISH		76.90
White Perch (<i>Morone americana</i>)	36.08	
Sunfishes (<i>Eupomotis gibbosus</i> and <i>Lepomis auritus</i>)	10.10	
Yellow Perch (<i>Perca flavescens</i>)	8.18	
Minnows (Cyprinidae)	6.14	
Small-mouthed Bass (<i>Micropterus dolomieu</i>)	4.00	
Common Sucker (<i>Catostomus commersonii</i>)	3.60	
Trout or Salmon (Salmonidae)	2.00	
Unidentified fish	6.80	
MISCELLANEOUS ANIMAL FOOD		6.86
Insects (chiefly Hymenoptera and Coleoptera)	3.44	
Mollusks (Unionidae)	2.06	
Birds (Compothlypidae and Fringillidae)	1.36	
VEGETABLE FOOD		8.04
Miscellaneous vegetation (Algae, <i>Carex</i> , Graminae)	4.64	
Blueberries	3.40	
REFUSE (garbage and carrion)	8.20	
	100.00	100.00

¹ This study was conducted by the Maine Cooperative Wildlife Research Unit, under the direction of C. M. Aldous, U. S. Biological Survey, leader, the University of Maine, the Maine Commission of Inland Fisheries and Game, and the American Wildlife Institute, cooperating.

From the foregoing Table it would seem that the sport fisherman has little to fear from the food habits of the Herring Gull. Maine's important game fishes—trout and salmon—occurred in only one stomach and represented only 2 per cent of the total stomach contents examined.

This certainly does not warrant any bitter condemnation of the Herring Gull and could not, even to the most avid fisherman, justify a program of its control. Moreover, the habit of trout and salmon of remaining in the deeper water of lakes during most of the summer render it extremely difficult for gulls to obtain them in any numbers even when other food is so scarce as to necessitate a deliberate search for these fishes.

Thirty-six per cent of the total food of the birds examined was found to be white perch. This is a common species throughout Maine, particularly in the southern half of the State. Although a favorite of some anglers in waters not populated with trout and salmon, its numbers are great enough so that there is little danger of the gulls depleting the supply. In fact, unpublished data from growth studies made by G. P. Cooper indicate that the perch population in many Maine lakes is far too high; such overpopulation results in stunted fish. Also, white perch are probably an important factor in causing the gradual disappearance of trout and salmon from many lakes in southern Maine. Thus the gull might be benefiting trout fishermen by reducing the numbers of perch.

The second most important food from the gulls' standpoint is sunfish, represented by two species. Sunfish made up slightly more than 10 per cent of all food eaten. These fish are worthless from the standpoint of the anglers in this State at the present time.

Yellow perch, a fairly common fish in most Maine waters, constituted about 8 per cent of the food material examined. Although a few people eat this species, it is regarded as a nuisance by most sportsmen.

Various minnows—largely fallfish or chub (*Leucosomus corporalis*), with a few golden shiners (*Notemigonus crysoleucas*) and common shiners (*Notropis cornutus*)—formed about 6 per cent of the food. These fishes are very common and are valueless except as food for other fishes and as bait. Fallfish were the second most important food represented in the series of pellets collected at Moosehead Lake; since the size of the bones indicated fish of a length up to 15 inches, it seems probable that they had been taken as dead or dying fish. Various field observations I have made indicate that gulls seldom capture living fish exceeding 6 or 7 inches in length.

Black bass appeared to make up 4 per cent of the total food. With one exception, no whole fish of this species greater than 5 inches long was found in any stomach—yet some of the bones and fragmentary remains showed that much larger ones were sometimes eaten. One 9-inch

bass was obtained from a stomach, but the badly decomposed and bloated condition indicated beyond doubt that it had been dead at least two days when eaten by the gull. I believe that the other large bass eaten had been taken under similar conditions. The legal minimum length of bass that may be caught in Maine is 10 inches. It is a familiar fact that many smaller ones are caught—some just short of the legal size—and released; it is also well known that some such fish die and thus become available to the gulls which are probably incapable of catching and killing large, healthy bass. Dead bass are often seen floating on these waters or washed up on shore. I have seen a gull carrying away such a fish, and from the laborious way in which the bird flew—to say nothing of the bloated appearance of the fish—felt that it would be impossible for the gull to have captured it alive.

The common sucker composed 3.6 per cent of the food of the Herring Gull as shown by the stomach analyses, although the pellet examination indicated more remains of sucker than of any other species. Suckers are very abundant in most lakes in Maine; therefore predation by gulls could not be considered a serious liability to sport fishing even in lakes where the small suckers are important food for game fishes. In lakes in which suckers are so abundant as to compete seriously with game fishes for food, predation by gulls on suckers might be an asset to the fisherman. As was the case with bass and minnows, many of the suckers taken were large, 8 to 12 inches long, and consequently the gulls probably had not taken them alive.

Miscellaneous animal food composed 7 per cent of the entire stomach contents. Insects, chiefly ants and beetles, and fresh-water mussels were frequently found. The eating of birds, mainly warblers and sparrows, may or may not indicate predation, since it is usually difficult to determine from stomach analyses the means by which food is obtained. Remains of four birds were also found among the pellets collected at Moosehead Lake. My field observations on coastal breeding islands have shown that dead birds are often eaten by gulls but sometimes healthy, living birds are also captured. In any case, the taking of living birds by gulls is not frequent enough to be serious. It is interesting to note that among the regurgitated material collected was the entire carcass of a red squirrel (*Sciurus hudsonicus*).

Vegetable food constituted about 8 per cent of the total contents. The blueberries taken were probably all wild fruit. The remainder of the vegetable food consisted chiefly of algae and seeds of grasses and sedges.

Animal and vegetable material believed to be garbage or carrion made up 8.2 per cent of the food. This consisted chiefly of meat scraps, vegetable peelings, decayed fish refuse, and similar material. The Herring Gull is well known to be a scavenger and it hardly seems necessary to point out its value, particularly at lakes having a large number

of cottages and resort areas. Dead fish and table scraps provide easy meals for the watchful gulls. As a result, the resort lakes in Maine that are frequented by gulls are usually comparatively free from such refuse.

In considering the economic status of the Herring Gull, it should be borne in mind that population densities are often a major factor in determining the beneficial or detrimental qualities of a species. On the coast of Maine, for example, my studies have indicated an abnormally high gull population, with a certain amount of ensuing damage to some of man's interests, but this situation most certainly does not exist at present in inland waters.

SUMMARY

From the results of this study, it does not seem that the presence of Herring Gulls at the inland lakes of Maine need cause any alarm to fishermen. Most of the fishes taken by gulls are either species that are very abundant or else those having comparatively little value; predations on the abundant species cannot be considered as detrimental to sport fishing. The favorite game fishes, trout and salmon, were found to constitute one of the smallest items in the gulls' diet. Herring Gulls are not as yet very plentiful at any locality within the interior of the State except at Moosehead Lake, and unless a large population of the inland birds occurs in the future, it would seem unwise to practice any control. The taking of weak, dying, or dead fishes is probably of distinct benefit as a disease-control measure on behalf of the fish population. The general scavenger qualities of the gull are very commendable, especially in the summer resort areas. Fishermen and summer residents of Maine's lakes should not overlook the fact that, from the food-habits data at hand, the Herring Gull, in its present numbers, is an asset and not a liability.

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