

## THE HERRING GULLS OF HAT ISLAND, WISCONSIN

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HAT ISLAND is a small rocky island in Green Bay about three miles off shore of Egg Harbor, Door County, Wisconsin. The island is roughly triangular in shape and about 300 feet in diameter. It is covered with a heavy growth of nettle and dogwood. About a dozen trees grow on the island. Three to four hundred pairs of Herring Gulls (*Larus argentatus smithsonianus*) nest on the island every year.

My first introduction to the island came when I accompanied Harold Wilson, well-known bird bander of Door County, on his annual banding trip to the island in 1935. Over 800 young were banded on the island during that trip. In 1936 I returned to Hat Island with my wife, intending to camp on the island and make observations. On the first day I fell among the rocks and broke my ankle, forcing a postponement of the work to the next year. In 1937 we returned to the island and made observations and pictures of the nesting life of the gulls through a five-day period. We arrived on June 12 and left the island on June 17.

## NEST AND YOUNG

Upon our arrival we found only 9 nests with eggs. All others had hatched and the island was overrun with young in all stages of development. Six of the 9 nests contained pipped eggs. Our observations of these nests showed hatching in the same clutch of eggs taking place at intervals of 12 to 24 hours. Ten to 48 hours elapsed from the time the egg was first cracked to the time the young finally freed itself of the egg shell. On some of the newly hatched young we found the yolk sac still exposed, the sac ranging in size from one-fourth to three-fourths of an inch in diameter. The new young rested upon the yolk sac as if it were a cushion and only by turning them over on their backs could the sac be observed. The yolk sac disappeared within 24 hours after hatching.

The young generally stayed in the nest for the first 2 or 3 days unless the nest was exposed to the sun and the adults failed to shade the young. In this case the young left the nest on the day of hatching and crawled into the nearest shade. They were very adept at hiding. As we approached, the young would run pell-mell in every direction, hiding in the thick growths of nettle and shrubbery or under logs and driftwood. We had to be very careful in stepping on driftwood for fear of crushing some young gull that might have taken refuge under it. Some young stuck only their heads under the logs, while others merely crouched among the rocks. In either case their gray, mottled down made an effective camouflage. Young gulls near the shore ran to the water and swam out into the lake with determination



Fig. 1. Gulls guarding their territories



Fig. 2. A gull trumpeting

and skill. Occasionally an adult gull would attempt to protect the young by swooping down upon us. Though these gulls skimmed close overhead they did not actually strike us at any time.

#### TERRITORIAL ORGANIZATION OF BREEDING GROUNDS

Several blinds were built to observe the behavior of the gulls on the nesting grounds. From the blinds we noted a very definite organization of the breeding grounds into territorial divisions similar to that described by Herrick (1935) for the Herring Gulls of Great Duck Island, Maine. The territories had an average area of about 65 square feet. Territories were almost constantly guarded day and night by one or both of the adults, though occasionally a territory would be left unguarded for several hours. A few of the territories seemed to be held by only one adult, and these, of course, were left unguarded during some periods of the day. While on guard in the territories the adults spent much of their time in sleeping, preening, scolding, or fighting. The gulls had quite a repertoire of scolding and clucking notes as well as a peculiar trumpeting call. In making the trumpeting call a gull lowered its head almost to the ground and opened its bill widely as if about to regurgitate. Then throwing the head high, and holding the bill wide open, it uttered a series of 4 to 20 harsh but resonant calls which sounded like, *ku-uh, ku-uh, ku-uh, ku-uh, ku-uh, ku-uh*. Often some disturbance, such as a lost young running through the colony, a pair of fighting adults, or the flapping of the burlap on the blind, set the whole colony to bellowing. Occasionally a pair of gulls engaged in a peculiar performance which looked much like a mating dance, though the season for courtship was long over. Two gulls, facing each other, would bend their heads together as if exchanging confidential secrets, clucking softly all the while, and shaking their heads in the jerky rhythm of feeding ducks. These "clucking matches" were usually performed by the gulls during a period of general excitement.

The boundaries of each territory were zealously protected by the gulls on guard. If any other gull trespassed into the territory or even by miscalculation landed in its neighbor's area, a fight was the immediate result. Pecking and parrying fiercely, they would grasp each other by the neck or bill and twist and pull vigorously with much flapping of the wings. Occasionally one gull grasped the other by a wing and jerked it about violently or even twisted the other gull upon its back. After several minutes the fight would end abruptly with the intruder beating a hasty retreat and leaving the rightful owner of the territory to trumpet wildly with excitement. Sometimes the fighting gulls stopped abruptly and one or both would begin to thrust viciously at driftwood and sticks, or sometimes they would savagely tear the leaves from nearby shrubs and nettles. During these periods of high

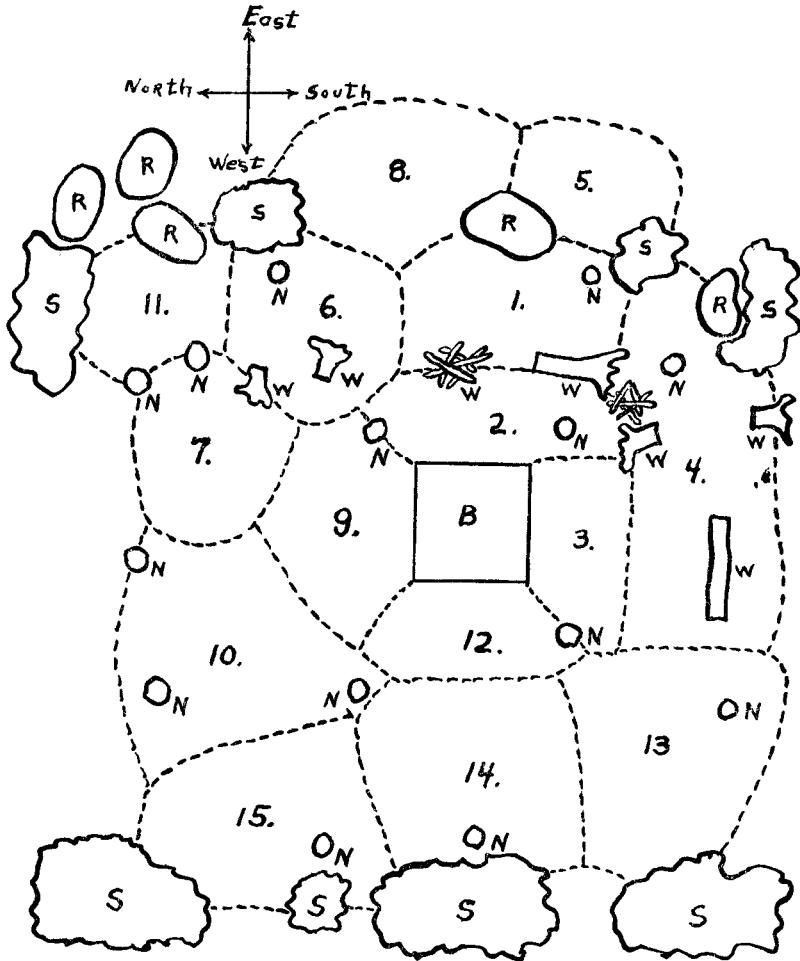


Figure 1. Map of Herring Gull Territories.

B—Bird blind (6 by 6 feet)	N—Old nest
S—Shrub	W—Driftwood
R—Rock	

excitement a gull sometimes picked up and carried about a piece of wood or rubbish. The excitement of the fight was highly infectious and most of the gulls in the vicinity would trumpet loudly during such a squabble. While adults did not seem to injure each other seriously during these fights, they all carried the battle scars on their heads and bills. By watching these fights closely we were able to determine the exact boundary of each territory.

Young gulls as well as adults had to respect these territorial claims. If a young gull was caught in any other territory but that of its parents it was brutally attacked and sometimes killed. This killing of trespassing young probably accounts for the large number of dead young found on the island. Several times we saw unprovoked attacks by adults upon young out in the open water and on parts of the island where no territories existed. The bulk of the killings, however, were due to the vigorous defense of territorial boundaries by adult gulls.

Some of the young gulls never left their home territory and so received the full protection of their parents. These young were usually fortunate enough to have shrubbery or driftwood in their territory under which they could hide in an emergency and where they could find shade during the hot part of the day. Other young habitually left the territory even though they were not disturbed. One family of 2 half-grown young, living in Territory No. 12 (see map), habitually left their territory to go down to the beach to bathe and swim or to sleep in the nearby shrubbery. These two young were experts in running through strange territories and in dodging the vicious thrusts of the adults they passed. Not all young were so successful. Sometimes an adult gull would catch a trespassing young by the neck and shake it unmercifully or pound it over the head until it was seriously injured or dead. During such a struggle the young one would scream pitifully, and the surrounding neighborhood of gulls would be thrown into a chaos of excitement. No gull, not even the rightful parents of the young bird, would come to its rescue. We saw the gull of Territory

TABLE 1  
CENSUS OF GULL FAMILIES FOUND AROUND THE BLIND

Territory number	Number and age of young	Remarks
1.—	1 young, $\frac{2}{3}$ grown	
2.—	2 young, $\frac{1}{3}$ grown	
3.—	2 young, $\frac{1}{2}$ grown	
4.—	2 young, $\frac{1}{2}$ grown	
5.—	3 young, $\frac{1}{2}$ grown	On the third day one of these young was killed by the adult in No. 1
6.—	3 young, $\frac{1}{4}$ grown	Two of these young disappeared on the third day
7.—	1 young, $\frac{1}{3}$ grown	
8.—	3 young, $\frac{1}{2}$ grown	On the first day one of these young was killed by the adult in No. 6
9.—	3 young, $\frac{1}{2}$ grown	All of the young in this family disappeared on the second day. Possibly they moved out, though an adult continued to guard the territory
10.—	2 young, $\frac{1}{2}$ grown	
11.—	1 young, $\frac{1}{3}$ grown	
12.—	2 young, $\frac{1}{2}$ grown	
13.—	1 young, $\frac{1}{3}$ grown	
14.—	3 young, $\frac{1}{3}$ grown	
15.—	3 young, $\frac{1}{2}$ grown	

No. 8 stand by and watch the adult of Territory No. 6 brutally murder one of its young. The gull in Territory No. 8 trumpeted and scolded but refused to cross into its neighbor's territory to aid its young. If the young one broke away from its tormentor and crossed the invisible boundary line into its own territory its parents would vigorously protect it, refusing to let any gull other than their own young come into the home territory. Sometimes an adult gull would eat the young it had killed, ripping it open and eating the entrails. On one occasion we saw an adult gull feed to its own young the entrails of a young it had just killed. At another time we saw a gull swallow entire a young about one-third grown.

#### FEEDING OF THE YOUNG

Each gull fed its young in its own territory. Occasionally the young from a nearby territory might rush in to partake of the food delivered, but they were always discovered and summarily driven out by the adult gull. More frequently a neighboring adult would rush in and attempt to snatch away some of the food. At no time did we observe an indiscriminate feeding of young or the mobbing of an adult by the young for food as described by Ward (1906) on Gravel Island, Wisconsin. We did see a few feedings outside of territorial boundaries. Twice we noted feedings out on rocks in the water some distance from shore. These rocks were not held as a territory by the adult gulls. In another case we saw a feeding out on a rocky spit, which was not held as a regular territory by adult gulls. All of these cases happened in the vicinity of our camp and probably were caused by the disruption of the territories by our camping activities. On the undisturbed portion of the island where we kept our blinds and did most of our observing there was no flocking of the young and no feedings outside of territorial boundaries.

Gulls, heavily laden with food, came in from over the lake in straight, business-like flight, and flew directly to their territory. Sometimes the young would rush to the adult as it landed, apparently recognizing the adult while it was still in the air. If the young did not appear promptly the adult would bend its head low and utter a soft cry. This cry usually brought out the young if they were in the vicinity. When the young reached the adult they would stop abruptly in front of it and begin to bow and bob, reaching up occasionally to peck at the bill of the old gull. Within a few minutes the lower neck of the adult gull would begin to swell, the swelling becoming most pronounced just in front of the shoulders. With several convulsive movements the gull would stretch its neck to the ground, open its bill widely, and regurgitate the food upon the rocks. The young would quickly grasp the food and, throwing back their heads, greedily gulp it down. Often they would begin their begging movements again, bowing and bobbing before the adult.

The food most frequently delivered to the young was fish. Once we saw a fish at least a foot in length regurgitated by an adult and swallowed entire by a half-grown young. Occasionally perch 6 to 9 inches long were regurgitated, but the usual fare for the young gulls was chubs and minnows 4 or 5 inches in length. Sometimes the food was so predigested that it was impossible to identify it. This predigested fare formed most of the food for the smallest young, though occasionally the largest young received it. Several times we noticed a very peculiar food regurgitated by the adults. It looked much like coffee grounds which the young would pick up particle by particle. We were very much puzzled by this strange fare and finally, at the next feeding of this kind, ran out of the blind, frightening away the adult and the young before they could recover the food. We found it to be a mass of small beetles partly digested.

Sometimes the adults were very slow in regurgitating, taking as much as 15 minutes from the time the swelling first appeared on the back of the neck until the food was deposited upon the rocks. In such cases the young that had first started the regurgitation process by begging movements often became discouraged and retired into nearby shrubbery. The adults, however, were never perturbed by the failure of the young to partake of their offering; they simply swallowed the whole lot again. There were no leftovers from a meal. In fact, the young and the adult frequently fought and scrambled over the food, once it was regurgitated, both swallowing greedily.

#### SUMMARY

Among the Herring Gulls of Hat Island there was a definite territorial division of the breeding grounds. The young, at least until they were half-grown, were fed almost exclusively in these territories. The adult gulls were discriminating and fed only their own young. Territorial boundaries were protected by the adults by vigorous fighting. Trespassing young from neighboring territories were frequently killed in this defense of territory by an adult gull. Adult gulls made no attempt to rescue their own young which had strayed out of the home territory and were then attacked by other adults. The food brought in by adults consisted usually of fish but sometimes of quantities of small beetles.

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