

COMPARATIVE BEHAVIOR OF THE KILLDEER AND THE SPOTTED SANDPIPER

JOANNA BURGER

Two shorebirds, the Killdeer, (*Charadrius vociferus*), and the Spotted Sandpiper, (*Actitis macularia*), belong to one suborder, Charadrii even though they are in separate families. Although they are not closely related, their mode of life and habitat are similar. During May, June and July of the summer of 1961, I observed the nesting and juvenile behavior of these two birds. Their nests were located near the Mohawk River, in Schenectady County, New York.

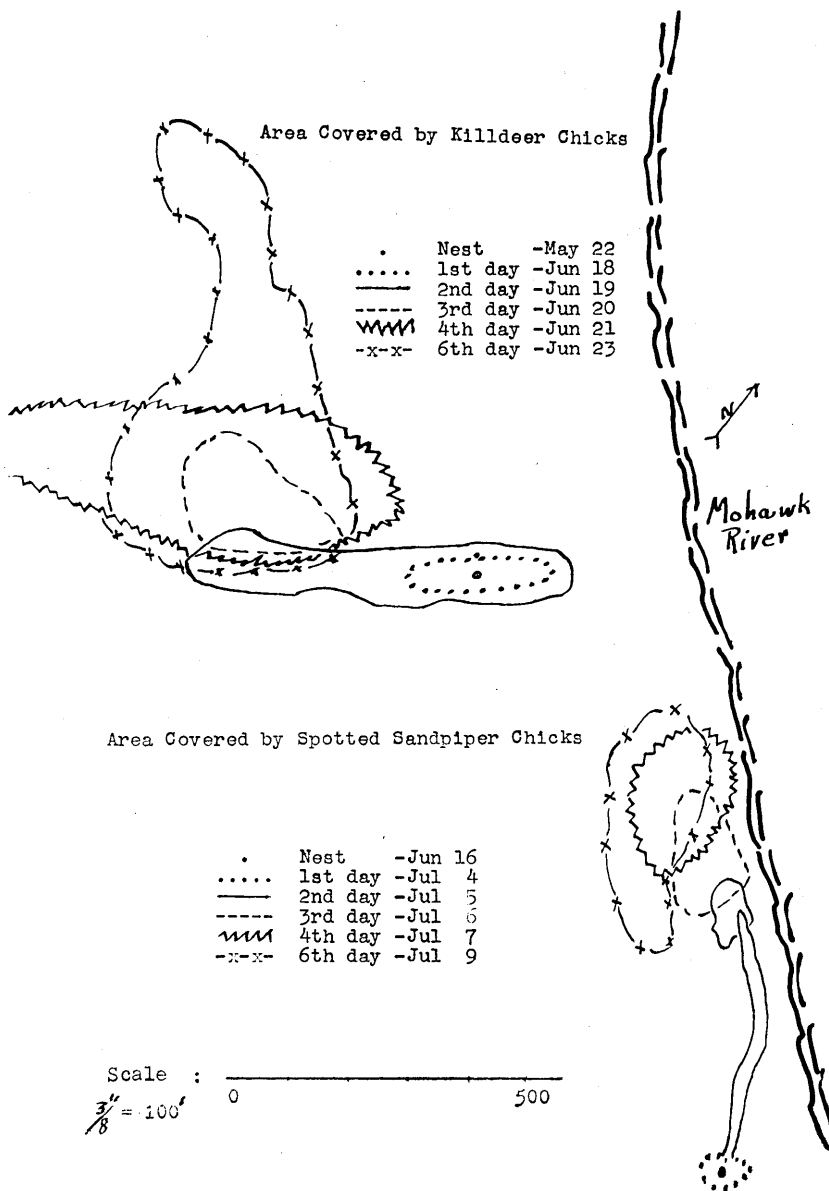
Observations on the Killdeer were made with binoculars, and those on the Sandpiper were made from a box blind three feet from the nest. Observations were directed primarily to releasers, learning and distraction displays, coloration, and agonistic or hostile behavior. Differences in nest site and material, and adult and nesting behavior between the two species were noted. The activities of the chicks were observed, with special emphasis on increased radius of travel with daily growth.

The Killdeer's nest was found 22 May in an open cabbage field. The nest, only a depression in the ground was scantily lined with grass and contained four drab greenish buff eggs, each pointing toward the center. The pair of Killdeer was very noisy, never ceasing their incessant "Kill dee". Both parents and nest blended in well with their surroundings. Only a strip of exposed white between the nest and the wing broke the continuity in the outline of the bird and the nest.

When an intruder appeared, hostile behavior in many forms were elicited. When approached, the parents would slip from the nest, run a short distance, and fly noisily into the air. The closer I came to the nest, the louder their cries, until I came within five feet, when they watched in silence. When I neared the nest, one parents would land very close to me, and then fly and hop away, feigning a broken wing. When the parent had led me away from the nest, it would soar high in the air, only to land about five feet from me, and repeat the act. They would also fly and land in a pattern of circles as if to confuse the intruder. Although the parents would desert the nest temporarily, they never completely deserted the field at any time. The incubation and protection of the nest were obviously a joint effort.

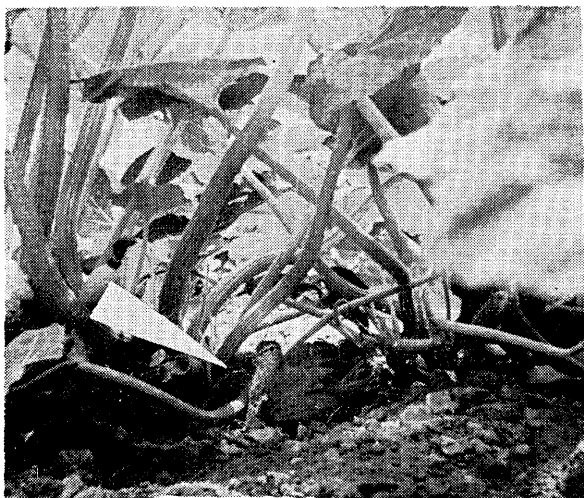
The incubation period lasted 24 days, with an interval of four hours between the first and the fourth egg hatching. When all the eggs had hatched, the parent started walking around the nest, until the chicks all followed. Perhaps this was the time of impromptu behavior patterns on the chicks. The precocial chicks could walk and run immediately, using their wings for balance. The coloration of the chicks, like that of the ground, served to camouflage the birds.

During the next week, the area covered by the chicks was noted. As is shown in the diagram, the chicks stayed within 120 feet of the nest, during the first day. However, they never returned to the nest. During the next day, the area covered increased, but it was interesting to note that the area covered was limited by the rows of plants. On the third and fourth days, they remained in a circular area not restricted by cabbage plants. This forage area was an open field, newly plowed in preparation for a second planting with freshly overturned earth exposed to feeding. By the sixth



day, the chicks had covered an area about 775 feet in length, and 310 feet in width.

The Spotted Sandpiper's nest was located 16 June, in a freshly planted squash patch. The nest, 55 feet from the river, was closer to the water than that of the Killdeer by 295 feet. The nest was a depression in the ground, but unlike the Killdeer's, it did contain a few twigs. The nest was very hard to see. The four brown speckled, cream eggs were smaller than the Killdeer's, and were level with the ground, also making the nest hard to see. Even with the parent on the nest, it was hard to locate.



Spotted Sandpiper on nest

After the first two days, only one parent was observed, the other parent either deserted or had been killed. Although similar in gross appearance to the Killdeer, it had a speckled breast, was constantly teetering, and cried "peet" endlessly. This lone parent had an elaborate scheme of distraction displays, yet its ritual was slightly different from the Killdeer's. When an intruder appeared, it would also slip from the nest. Instead of feigning a broken wing, it spread its wings, hunched its back, fanned its tail, and ran in a straight line for ten to twenty feet. It would repeat this behavioral pattern up to four times, occasionally jumping on the top of a squash plant to observe surroundings. The consummatory act was to fly noisily away, high over the river. Minutes later it would fly quietly back to slip silently onto the nest.

Forage behavior consisted of teetering about, snapping at bugs in the air and on the ground. Normally the bird did not leave the nest for more than ten or twelve minutes at a time.

A box blind three feet from the nest enabled me to observe the nesting behavior more closely. After a few days, the sandpiper treated it merely as another part of its environment. It settled on the nest with its head lowered into its feathers. At the least noise it would crane its neck, and often dart away. When excited, it teetered as much as 135 times per minute, while normally it teetered 60 to 85 times per minute.

Incubation lasted 18 days, and it took nine hours from the time the first egg hatched, about 7:20 in the morning, until the last egg hatched. The chicks were not quite as precocial as the Killdeer's: their bodies wobbled, and their motions were less co-ordinated. The chicks did not wander more than 25 feet from the nest during the first day. The parent used a low gurgling frog-like vocal noise as a sign stimulus. Unlike the killdeer chicks, they did not run about very much on the first day. The second morning the parent led the chicks to another field, probably because of the human activity, or the need for better forage area,. On successive days I located the chicks by the mother's cries and display actions, plus the chicks' noises. On the third day they remained in an area not longer than 185 feet. On the fourth day, the length of the area covered was 210 feet. On the sixth day, the area covered was as long as 375 feet, and as wide as 150 feet. Like the Killdeer, they never returned to their nest. Note the diagram for the area covered by the sandpiper chicks.

It is interesting to note the areas covered by the chicks of both species. Generally the area covered by the sandpiper was closer to the river than that of the Killdeer. The area covered by the sandpiper was parallel to the water, while that covered by the Killdeer was away from the water. In the same period of time, the sandpiper chicks covered less area than did the killdeer chicks. In regard to protective behavior, their displays were slightly different: the Killdeer feigning a broken wing, while running in a zig-zag line, and the Spotted Sandpiper hunched its back, and ran in a straight line. Whereas the Killdeer would never leave the field when an intruder appeared, the Spotted Sandpiper would. The incubation period of the Spotted Sandpiper was 18 days, while that of the Killdeer was 24 days. Although the chicks of both species were precocial, the killdeer chicks appeared better developed. In regard to gross appearance, however, the teetering of the sandpiper was unmistakable. At no time did I see any parent feed the chicks.

Although both species nest at relatively the same time, in the same local, and depend upon coloration and distraction displays for protection, readily apparent differences exist. The killdeer chicks hatched from eggs in a nest in an open field, 350 feet removed from the river and in six days had traveled in daily progressive stages 775 feet from the nest, away from the river.

In comparison the Spotted Sandpiper nest was 55 feet from the water and under the shade of a squash plant. The path of the Spotted Sandpiper chicks was along the shore and in the same time they had travelled approximately the same distance but always closer to the river bank.

1221 Ferry Road, Schenectady 9

Note: — We, the Editorial Board, thank Joanna Burger for this paper on her first ornithological project. Joanna carried out her project and prepared her paper on it, during her freshman year at the State University of N.Y., College at Albany under the supervision of Dr. Margaret Stewart Lemon. We gladly welcome, for consideration for printing in *The Kingbird*, papers on ornithological subjects within N.Y. State from budding ornithologists.

Ed.