

NOTES ON 1995 NESTING ATTEMPT OF GREEN HERON PAIR AT MOUNT AUBURN CEMETERY

by William E. Davis, Jr.

The Green Heron (*Butorides virescens*) is a cryptic breeder, usually nesting in protected sites within trees or shrubs. Hence, although it is a common, widespread species, many aspects of its natural history are poorly known (Davis and Kushlan 1994). Even though its breeding biology has been carefully studied in the northeast (Meyerriecks 1960) and in Mexico (Dickerman and Gavino 1969; Gavino and Dickerman 1982), surprising gaps remain in our knowledge of Green Heron nesting behavior.

On Wednesday, May 24, 1995, I was shown a pair of Green Herons nest building in full view at Auburn Lake in Mount Auburn Cemetery in Cambridge, Massachusetts. Using binoculars and a 20x telescope, I monitored this nesting attempt until June 12 from the ridge that overlooks the pond. I spent a total of 12.5 hours from May 26 through June 1 observing the nest and an additional two hours through June 12. The nesting attempt failed on June 14 with the eggs (or possibly young) missing. The nest with an incubating bird was observed on the evening of June 13 (J. Heywood, personal communication), but had been subjected to predation by the morning of June 14, when both birds were observed near the severely damaged nest (R. Kelley, personal communication).

The following notes include the more interesting aspects of this nesting attempt.

Nest Building and Courtship

Nest Location. The nest location was typical in that it was located over water but atypical in that it lacked the heavy overhanging branches that provide a cryptic setting and protection from the sun. This nest was about sixteen feet above the water surface in a forty-five-foot-high bald cypress (*Taxodium distichum*), which was sparsely foliated throughout the nesting period.

Nest Building. On the morning of Saturday, May 20, people first noticed the birds breaking off sticks and the rudimentary beginnings of a nest platform (R. Stymeist, personal communication). By the following Wednesday morning, May 24, when I made my first observations, the nest was nearly complete, although the male was bringing sticks to the female, which worked them into the nest, at a rate of about one per minute. The first egg was laid that morning. Green Herons typically continue to add sticks to their nests throughout the nesting period, but if we define the nest-building period as ending with the first egg, then the nest-building phase was four days in length. Building time for Green Heron nests has not been previously reported for North American birds (Davis and Kushlan 1994).

The male and female continued to break off six-to-seven inch sticks and bring them to their incubating partner, which would then work the sticks into the nest by "tremble-shoving" (where the bird grasps the twig in its beak and works it into the nest by pushing while vibrating its head), even after egg-laying ceased.

Courtship and copulation. The pair formation and courtship phase of nesting was not observed for this pair. Typically Green Heron courtship involves a variety of display flights and vocalizations, interspersed with "stretch displays" where the displaying bird points its bill straight up with neck extended and plumes erect and fanned. The head and neck are then bent backward until they almost touch the back. Typically, stretch displays are continued through nest building and at nest relief, but I did not see any performed by this pair. There was little or no nest relief ceremony other than bill-clapping and tail-flicking by the female (tail-flicking often occurs in conflict situations), and the male raising its wings slightly before leaving the nest. For descriptions of Green Heron displays, see Davis and Kushlan (1994) or Meyerriecks (1960).

One courtship aspect was well pronounced. Both birds underwent marked soft-part color changes. Initially (May 24), the male (determined by position during copulation) had bright pink-orange legs and solid black lores, while the female had yellow-orange legs and dark lores with light flecks. The male plumage was generally brighter than the female's, and his back and crown were glossier. The pink coloration of the male's legs was distinctive, but pink has not been reported as characteristic for male leg color during courtship for Green Herons, although Pough (1951) described the color as orange-red. The pink color gradually changed to the yellow color characteristic of Green Herons in the nonbreeding season. The female's leg color also faded, and by June 2 I could not identify the herons by leg color with confidence. The lores color differences persisted, however.

Copulation was witnessed on May 26 immediately after the male returned for nest relief (7:20 AM), and on May 30 following nest relief by the female (10:30 AM). There were no ceremonies associated with the copulations other than the male arriving at the nest carrying a twig.

Egg Laying, Incubation, and Related Activities

Egg laying and clutch size. The first egg was laid between 8:30 and 9:30 AM on May 24 (R. Kelley, personal communication). The following morning there was still a single egg, but on the morning of May 26, two eggs were present. By the afternoon of May 30 I counted four eggs, and by June 1 a fifth egg was present. The normal clutch size for Green Heron is three to five (Davis and Kushlan 1994).

Incubation. The pattern of incubation for this pair was consistent with that generally reported for Green Herons. Incubation was intermittent until the third



egg was laid. The male has been reported to incubate mostly in the middle of the day and night, with the female mostly in the early morning and early evening. Since my observation at this nest was intermittent I could not discern any diurnal pattern. However, in the one day when observation began before dawn, the female was on nest at 4:33 AM but was relieved by the male at 5:50 AM. On the only day that observation continued until after sunset, the male was on nest at dark.

Related activities. While incubating, both birds frequently rearranged sticks by tremble-shoving. On several occasions the incubating bird would stand and "foot paddle," shifting its weight from one foot to the other on the nest platform. The function of this behavior is unknown, but is also practiced by the Black-crowned Night-Heron (personal observation). Egg rolling was a frequent incubation activity. On May 30 I recorded five egg rolling bouts in about three and a half hours, and on June 1 five bouts in two and a half hours.

The nest-sitting position of the birds varied considerably with time of day, but it was my impression that the birds positioned themselves primarily to allow them to observe the road near the nest along which foot traffic and automobile traffic were considerable, and secondarily to avoid looking directly into the sun.

On June 1 it was about eighty degrees in the afternoon, and the birds were clearly stressed by the heat and direct sunlight (there was virtually no protection by foliage). Both birds performed "gular flutter" (used as a cooling mechanism by many avian species), where they held their beaks slightly open and rapidly vibrated the thin floor of their mouth and upper throat. This behavior is common in the Black-crowned Night-Heron (Davis 1993) and is probably common in the Green Heron, although strangely, it has not been previously reported in the literature. The male also rose to a half-crouch with wings dropping suggesting that he was shading the eggs rather than incubating them.

Response to Potential Nest Predators and Human Disturbance

Reaction to birds in the nest tree. When nesting in aggregations, Green Herons generally defend a territory that gradually shrinks during the breeding season until it may encompass only the nest and immediately surrounding area.

They may defend a larger territory when nesting solitarily, but data are not available (Davis and Kushlan 1994). In this instance, sixteen species of birds were recorded perching in the nest tree, and ducks and Canada Geese occasionally swam directly under the nest. The herons' response to birds lighting in the nest tree depended largely on the distance the intruder was from the nest. For example the male heron raised its head and pointed its bill at an oriole that lit four-to-five feet from the nest, but a grackle, a potential nest predator, drew no response when fifteen feet away. The heron watched grackles at distances of seven and ten feet, but stood, turned around, and bristled at a grackle that landed 1.5 feet away. The heron pointed its bill at a goldfinch four-to-five feet away, and my notes read: "clearly doesn't like anything getting within that range." The reactions were somewhat variable, however, as the heron turned its head around and then shifted its sitting position to face a grackle about ten feet away, and on another occasion raised its scapular plumes in an aggressive display when a grackle approached to within seven feet. A Red-winged Blackbird lit within a foot of the nest, and the heron stood up and faced it with feathers erect in a clearly aggressive display. Head movements suggest that the herons usually watched crows that flew over.

Reaction to humans. On May 24 the two Green Herons were heavily involved in nest-building activities despite the fact that dozens of birdwatchers were watching them while others were walking by within thirty feet of the nest under construction. This suggests that these birds were atypical in their response to the presence of humans and may have been habituated to their presence. When incubation began, however, both birds usually indicated that they were aware of human presence by raising their heads and following people with their eyes. There was no noticeable difference in their response to humans on foot, in cars, or trucks, or to lawn mowers. At least in the first week of incubation, it was my impression that the herons were not significantly affected by human activity.

Response to squirrels. Gray squirrels were frequent visitors to the nest tree, and on May 24 one squirrel approached to within ten feet of the nest without any response from the incubating heron. On May 30, however, the male bird was incubating when on two occasions a squirrel approached to within several feet of the nest. The male put on a spectacular aggressive display on both occasions. At 7:48 AM the heron stood up in the nest and while crouched, threw out its wings perpendicular to its body with primary tips pointing skyward and the bend in the wing down so that the fully extended wings faced the squirrel. On the first occasion the heron held this pose for about twenty seconds (I recorded the sequence on videotape) after which the squirrel turned and left the tree. At 8:59 AM a squirrel again approached the nest. This time the male stood in the nest and gave a "full forward display" with its head and neck fully extended forward, crouched, and feathers fully erect, bill open, and eyes bulging. It then lunged at the squirrel with its bill with wings fully extended as

in the first encounter, causing the retreat of the squirrel. At this point a grackle landed near the back of the nest, and the heron turned around, walked back about a foot to the nest, and attacked the grackle. The wing-out aggressive displays in defense of the nest have not been previously described in the literature.

Final Notes

The incubation period for the Green Heron is generally considered to be about 19-21 days from the laying of the last egg, although there is one report of hatching after seventeen days (Burns 1917) and many reports do not specify with which egg the incubation period starts. It is possible, therefore, that the predation of the nest followed or coincided with the hatching of one or more eggs. The first egg was laid on May 24 and the fifth probably on May 31, and it was about twenty-one days from the laying of the first egg to the time of predation. It is possible that the hatching drew the attention of mammalian (e.g., raccoons) or avian (e.g., crows) predators, and the predation of this atypically unconcealed nest occurred at this time. The atypical nest site selection suggests that one or both of the birds may have been naive or first-time breeders.

Neither bird was observed feeding at Auburn Lake, but there were numerous reports of the birds feeding at Willow Pond. Whether this behavior was related to differences in foraging opportunities or nest-vicinity avoidance is problematical.

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