

# Multiple Nest-Tending Behavior in an Adult Female White Ibis

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**Abstract.**—A non-breeding adult female White Ibis (*Eudocimus albus*) was observed tending multiple nests during the 2006 wading bird breeding season in the Florida Everglades. This is the first known case of adult multiple nest-attending breeding behavior documented for the Ciconiiformes order. Received 2 July 2006, accepted 3 September 2006.

**Key words.**—Breeding, *Eudocimus albus*, Everglades, Florida, nest-attendance, nest behavior, White Ibis.

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Multiple nest-attendance by adults has not been reported previously for any Ciconiiformes species (Skutch 1999; Kushlan and Hancock 2005). Here we report the first documented instances of an adult Ciconiiforme tending multiple nests. An adult radio-tagged White Ibis was observed tending four separate nests, none of which were her own.

The breeding biology of White Ibis (*Eudocimus albus*) was studied at the Arthur R. Marshall Loxahatchee National Wildlife Refuge, Palm Beach County, Florida, during Jan-June 2006. Nesting Colony 3 (26°31'N, 80°17'W) was visited every two to three days and consisted of >20 tree islands, 0.04-0.13 ha in size. Ibis nests were generally less than 1 m apart, numbered 2000-3000, and constituted over 95% of nests at Colony 3.

White Ibis were radio-tagged in Water Conservation Area 2, just south of the Arthur R. Marshall Loxahatchee National Wildlife Refuge, as part of a project aimed at measuring the physiological response of White Ibis to landscape level prey availability. All radio-tagged ibises were classified as adults based on their plumage characteristics (Kushlan and Bildstein 1992). Gender was determined from blood tests conducted by Zoogen Services, Inc., Davis, California. Research techniques were approved by the Florida Atlantic University, Institutional Animal Care and Use Committee (Protocol A0534), and conducted under U.S. Fish and Wildlife Service Research Permit 23354, and Florida Fish and Wildlife Conservation Commission, Scientific Research Permit WX04487.

## OBSERVATIONS

An adult female White Ibis (hereafter the ibis) was radio-tagged on 10 March and found in Colony 3 on 11 April. The location of the bird was narrowed to a specific island within the colony on 25 April. To identify the nest with which the ibis was associated, an observer first triangulated the radio signal of the ibis to a portion of the island and subsequently sighted the ibis with binoculars. On 28 April, three video cameras were placed on a segment of the nesting island to pinpoint the bird's nest. Upon review of the video tape the ibis was observed to approach one of the nests and rearrange the eggs. It was assumed that this nest belonged to the ibis.

On 14 May, both bal-chatri (Bub 1991) and modified cylindrical traps (Frederick 1987) were placed on the nest assumed to belong to the ibis. While setting the traps, the ibis was observed to fly from a cluster of ten nests to an adjacent tree, where the ibis remained until setting the traps was completed and observers departed the island. Within five min, the ibis returned to the cluster of nests, where it remained for >90 min without returning to one particular nest, as had other adult ibises.

The ibis approached three separate unattended nests located one to eight m apart. None of these nests were those that the ibis was seen approaching in the video on 28 April. Two of these nests had clutches of two eggs and the remaining nest contained two 14-day-old chicks (*sensu* De Santo *et al.*

1990). Upon approaching each nest, the ibis first acquired fresh nesting material, usually a branch from a cocoplum tree (*Chrysobalanus icaco*) with live leaves, and then began to weave the fresh material into the nest. Depending on nest contents, the ibis either rearranged the position of eggs or shaded the chicks, which did not seem bothered by the bird's presence. The ibis was not seen to brood or feed chicks, although separate male and female pairs were observed either shading or feeding each of the nests that the ibis was observed tending. At all three nests, an attendant adult male White Ibis standing nearby eventually aggressively approached the ibis, forcing it to abandon its efforts to tend the nests. In total, the ibis was located by radio telemetry and observation on the same nesting island twelve days between 25 April and 22 May.

#### DISCUSSION

Multiple nest-attendance similar to our observation on White Ibis has been documented for only second-year birds (non-breeding age) when adults were not present in the colony (Kushlan and Bildstein 1992). Our observations suggest that adult ibis also participate in this nesting behavior, perhaps after having their own nest fail or as non-breeding adults. We observed multiple nests fail on the nest island in Colony 3. In this case the ibis tended multiple nests in the presence of an adult associated with the nest and was continually associated with only one portion of the nests on one nesting island.

Theory suggests that cooperative breeding should only occur when individuals within a species are inhibited from breeding as result of an ecological constraint (Gaston 1978; Emlen 1982; Arnold and Owens 1998). These constraints may also result in the observed multiple nest-attendance behavior, and could include nest sites, prey availability, and mate availability. Although the nest-attendance behavior we observed does not meet the definition of cooperative breeding, the fact that the female ibis was not driven away immediately suggests that there was at least short-term acceptance of the female at all nests.

In all observations, at least one adult associated with each nest was present in the colony when the ibis tended their nest, however; the ibis could have also tended their nests in their absence, as reported in second year ibis (Kushlan and Bildstein 1992). This behavior, although presumably not common, could result in an energetic advantage for those birds with a helper tending their nest. Nests tended by multiple adults might also be less likely to be depredated in the absence of one of the breeding adults. The frequency of this type of behavior is difficult to ascertain because few researchers conduct detailed observations in White Ibis nesting colonies.

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