

A NON-INDIGENOUS WADING BIRD BREEDING IN THE FLORIDA EVERGLADES: THE SACRED IBIS

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During the 2005 dry season, while studying the breeding biology of Everglades wading birds at the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Palm Beach County), we documented the first nesting efforts of the non-indigenous Sacred Ibis (*Threskiornis aethiopicus*) in the Florida Everglades. The Sacred Ibis is a medium-sized (65-75 cm long) white ibis, with black highlights on its head and neck, wing-tips, and ornamental plumes along its back. The head and neck are featherless and covered with black scaly skin. The adult iris is brown and its lower eyelid is pale pink. The decurved bill is relatively broad and black with gray grooves on the sides of the upper bill. The distinctive black plumes begin at the scapulars and form a loose, lace-like net across the back, closed wings, and tail. Its legs and feet are featherless and also black. Bare skin beneath the wings is bright red during breeding. Males tend to be slightly larger (average 1499 g) than females, (average 1209 g; Clark 1979a). Hancock et al. (1992) provide a detailed description of the species.

Sacred Ibis are colonial wading birds native to wetlands throughout Africa (Hancock et al. 1992). However, they have escaped captivity in 12 European countries and currently breed in the wild in Belgium, France, Italy, the Netherlands and the Canary Islands (Clergeau et al. 2005). The breeding season of the Sacred Ibis coincides with the wet season (December-March) in its native habitat, when prey abundances increase. Their clutch size is generally 2-5 eggs, with an incubation period of 28-29 days. Both sexes incubate and feed the young, which leave the nest at 2-3 weeks post hatching and form conspecific crèches. They fledge at 35-40 days of age, and leave the colony at 35-48 days. Sacred Ibis adults feed principally on aquatic insects, insect larvae, amphibians, and other small aquatic animals (Urban 1974, Clark 1979b, Hancock et al. 1992). Chicks are primarily fed insects and crustaceans

(Kopij et al. 1996) and, after fledging, also forage for insects on dry land during periods of aquatic prey shortages. Adult and chick prey selection is similar to that of the White Ibis (*Eudocimus albus*; Kushlan and Bildstein 1992).

Previous observations in Florida.—The earliest sighting of feral Sacred Ibis in Florida occurred during the mid 1990s at the Miami Metro Zoo shortly after Hurricane Andrew (1992) (J. Sailor, Metro Zoo, pers. comm.). Although the Miami Metro Zoo kept Sacred Ibis in their avian collection before Hurricane Andrew, all of their birds were recovered after the hurricane (J. Sailor, Metro Zoo, pers. comm.). The feral birds may have escaped from a private collection in the Homestead area. Sacred Ibis have been reported at several locations throughout Florida since the mid 1990s; sightings have been scattered both spatially and temporally and primarily in developed regions. Sightings in south Florida, include the Palm Beach Zoo, Palm Beach County (2000; K. Lovett, Palm Beach Zoo, pers. comm.); Dump Marsh, Dade County (2002; B. Rapoza, pers. comm.); Deering Estate, Miami-Dade County (2003; E. Lent, pers. comm.); Caloosa Golf Course, Dade County (2004; E. Einspruch, pers. comm.); and the Palm Beach Waste Management facility, Palm Beach County (1998, 2000, 2004, and 2005; M. B. Morrison, Solid Waste Authority of Palm Beach County, pers. comm.). The only observation of a Sacred Ibis in undeveloped habitat was in 1999 in the Shark River Slough, Everglades National Park (E. Lent, pers. comm.). Sacred Ibis have not been reported as seen during a Christmas Bird Count (CBC) in Florida or across North America (Audubon Society 2005).

Breeding of feral Sacred Ibis in developed areas has been observed at the Metro Zoo in Miami since shortly after hurricane Andrew (J. Sailor, Metro Zoo, pers. comm.) and at the Palm Beach Waste Management Facility in 2004 (M. B. Morrison, Solid Waste Authority of Palm Beach County, pers. comm.). The Metro Zoo population has grown from several to approximately 40 individuals despite efforts to prevent nesting (J. Sailor, Metro Zoo, pers. comm.), suggesting they may be nesting elsewhere in the vicinity.

Breeding in the wild in Florida.—During the 2005 dry season (November-May) we examined wading bird breeding success in the Everglades at the Arthur R. Marshall Loxahatchee National Wildlife Refuge (LNWR), Palm Beach County. To examine nest survival we visited wading bird nesting Colony 111 (26°31N, 80°16W) every 3-4 days. The colony consists of 12 tree islands, 0.04-0.13 ha in size, dominated by cocoplum (*Chrysobalanus icaco*), willow (*Salix* spp.), dahoon holly (*Ilex cassine*), smilax (*Smilax laurifolia*), red bay (*Persea borbonia*), and wax myrtle (*Myrica cerifer*). Over 90% of the nests at Colony 111 were White Ibis, with the remainder being Black-crowned Night-Herons (*Nycticorax nycticorax*) and Great Egret (*Ardea alba*).

On 23 May 2005, we observed two adult Sacred Ibis roosting on a tree island in Colony 111. We photographed the birds, took field notes on their appearance, and determined that neither bird had leg bands. Later that day we observed one adult thermal soaring with three Wood Storks (*Mycteria americana*) approximately 500 m south of Colony 111. The adult's soaring behavior comprised approximately five seconds of thermal soaring followed by an equivalent period of rapid wing beats. On 30 May, we revisited the site and observed two adults at a nest with two downy chicks (~15 days old) (Fig. 1). The nesting island was 17 × 43 m in size, with approximately 75 White Ibis nests. The nest was constructed of sticks and was similar to adjacent White Ibis nests; it was 2.3 m above the ground in a cocoplum; the nest bowl was round and 46 cm in diameter.

On 7 June, we removed the two chicks and relocated them to the Busch Wildlife Sanctuary, Jupiter, Florida. While removing the chicks, we



Figure 1. Adult (center) with 15-20 day old chick (lower left) at Colony 111, Arthur R. Marshall Loxahatchee National Wildlife Refuge, Palm Beach County, Florida.

discovered a second Sacred Ibis nest, containing one egg (Fig. 2). The second nest, also in a cocoplum, was 2.8 m above ground, and 44 cm in diameter. The nest later failed, perhaps due to the onset of the rainy season.

The discovery of these nesting efforts of the Sacred Ibis in the Everglades is both interesting and alarming. Non-native Purple Swamphen (*Porphyrio porphyrio*) (Pranty et al. 2000, Pranty 2004) and Egyptian Geese (*Alopochen aegyptiacus*) (Braun 2004) successfully breeding in Florida illustrate the potential for future successful Sacred Ibis nesting in the region. While locating medium-sized conspicuous wading birds might seem straightforward, these birds are difficult to detect among other predominantly white wading birds. We visited this colony of over 2000 pairs of White Ibis 18 times before detecting the nesting Sacred Ibis pairs. The vast size of the Everglades ecosystem and number of breeding colonies may prevent detection and dispersal of these birds before they become established throughout the Everglades.

Introductions of non-native species have often resulted in slow but gradual population growth patterns; however, there exists the potential for exponential growth once a population becomes established (e.g., Monk Parakeets (*Myiopsitta monachus*, Pruett-Jones et al. 2004; Mute Swans (*Cygnus olor*, Petrie and Francis 2003). Developing a program to monitor population growth and habitat use of Sacred Ibis and other nonnative birds would provide important information to facilitate a better understanding of the potential for competitive interactions with native birds.



Figure 2. Sacred Ibis egg at Colony 111, Arthur R. Marshall Loxahatchee National Wildlife Refuge, Palm Beach County, Florida.

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LITERATURE CITED

- BRAUN, D. G. 2004. First documented nesting in the wild of Egyptian Geese in Florida. *Florida Field Naturalist* 32:138-143.
- CLARK, R. A. 1979a. Seasonal levels of body fat, protein, ash and moisture in the Sacred Ibis. *Ostrich* 50:129-133.
- CLARK, R. A. 1979b. The food of the Sacred Ibis at Pretoria, Transvaal. *Ostrich* 50:104-111.
- CLEARGEAU, P., P. YÉSOU, AND C. CHADENAS. 2005. Ibis sacré: état actuel et impacts potentiels des populations introduites en France métropolitaine. *L'Institut National de la recherche agronomique. Contract* 137 44-10/60.
- HANCOCK, J. A., J. A. KUSHLAN, AND M. P. KAHL. 1992. *Storks, ibises and spoonbills of the world*. Academic Press Inc., San Diego, CA.
- KOPLJ, G., O. B. KOK, AND Z. N. ROOS. 1996. Food of Sacred Ibis *Threskiornis aethiopicus* nestlings in the Free State province, South Africa. *Ostrich* 67:138-143.
- KUSHLAN, J. A., AND K. L. BILDSTEIN. 1992. White Ibis. *In* A. Poole and F. Gill (eds.). *The Birds of North America*, No. 570. The Birds of North America, Inc., Philadelphia, PA.
- NATIONAL AUDUBON SOCIETY. 2005. The Christmas Bird Count historical results [Online]. Available <http://www.audubon.org/bird/cbc> [6-10-2005].
- PETRIE, S. A., AND C. M. FRANCIS. 2003. Rapid increase in the lower Great Lakes population of feral Mute Swans: a review and a recommendation. *Wildlife Society Bulletin* 31:407-416.
- PRANTY, B. 2004. Florida's exotic avifauna: a preliminary checklist. *Birding* 36:362-372.
- PRANTY, B., K. SCHNITZIUS, K. SCHNITZIUS, AND H. W. LOVELL. 2000. Discovery, distribution, and origin of the Purple Swamphen (*Porphyrio porphyrio*) in Florida. *Florida Field Naturalist* 28:1-11.
- PRUETT-JONES, S., J. R. NEWMAN, C. M. NEWMAN, AND J. R. LINDSAY. 2004. Population growth of Monk Parakeets in Florida. *Florida Field Naturalist* 33:1-14.
- URBAN, E. K. 1974. Breeding of the Sacred Ibis *Threskiornis aethiopicus* at Lake Shala, Ethiopia. *Ibis* 116:263-277.