

**WHITE-FACED IBISES NEST AT
SALT PLAINS NATIONAL WILDLIFE REFUGE, OKLAHOMA**

BY
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The White-faced Ibis (*Plegadis chihi*) is considered a rare migrant and summer visitor in Oklahoma (Baumgartner, F.M., and A.M. Baumgartner, 1992, Oklahoma bird life, Univ. Oklahoma Press, Norman, pp. 74-75). This species is a "rare and erratic nester" in the Great Plains (Johnsgard, P.A., 1979, Birds of the Great Plains, Univ. Nebraska Press, Lincoln, p. 41) but has bred in several locations in the region surrounding Oklahoma (Johnsgard *op. cit.*; Rider, R.R., and E.M. Maney, 1994, White-faced Ibis, in The birds of North America, No. 130 [A. Poole, P. Stettenheim, and F. Gill, eds.], Acad. Nat. Sci., Philadelphia, & Amer. Ornithol. Union, Wash., D.C.). Since about 1970, it has undergone a range expansion (Baumgartner and Baumgartner, *op. cit.*; Sutton, 1967, Oklahoma birds, Univ. Oklahoma Press, Norman, p. 44), due in part to the ban of DDT and to habitat management on state and federal wildlife refuges (King, K.A., D.L. Meeker, and D.M. Swineford, 1980, White-faced Ibis populations and pollutants in Texas, 1969-1976, *Southwest. Nat.* 25:225-240; Ryder and Manry, *op. cit.*). This report represents the first and second known documentations for nesting of this species in Oklahoma.

For several years prior to 1992, White-faced Ibises have been observed annually throughout summer on Ralston Island, a 1.8-ha sliver of land in the northern part of Great Salt Plains Reservoir, in Salt Plains National Wildlife Refuge, Alfalfa County, northcentral Oklahoma (pers. observ.). As the refuge biologist, I decided to ascertain whether or not they were breeding.

In 1995, an estimated 19,000 Cattle Egrets (*Bubulcus ibis*) and about 4000 other herons and egrets of four species used this island for nesting, as did lesser numbers of Great-tailed Grackles (*Cassidix mexicanus*) and Double-crested Cormorants



Fig. 1. White-faced Ibis at nest. Salt Plains National Wildlife Refuge, Oklahoma, 21 June, 1995. Photo by Ron S. Shepperd.



Fig. 2. White-faced Ibis chick and eggs. Nest material primarily horseweed (*Conyza canadensis*). Photo taken 30 June 1995 at Salt Plains National Wildlife Refuge, Oklahoma, by Ron S. Shepperd.

(*Phalacrocorax auritus*; see following paper). These numbers were based on a survey of Ralston Island made 27 June 1995 by Marcus T. Koenen, Bryan R. Winton, and Dr. David M. Leslie, Jr., from the Oklahoma Cooperative Fish and Wildlife Research Unit at Oklahoma State University.

When refuge manager Rod Krey, United States Fish and Wildlife Service regional biologist Bill Howe and I visited Ralston Island on 14 June 1995, we discovered nine juvenile and several adult White-faced Ibises there. One week later, I counted eight adult ibises along that section of the island where we had earlier observed the young birds. After coming ashore, I began to search nearby shrubby vegetation for nests. The island was dominated by exotic salt cedar (*Tamarix* sp.), together with various assemblages and densities of smooth sumac (*Rhus glabra*), hackberry (*Celtis occidentalis*), honey locust (*Gleditsia triacanthos*), cottonwood (*Populus deltoides*), red mulberry (*Morus rubra*) and elms (*Ulmus* sp.). Horseweed (*Conyza canadensis*) and various grasses constituted most of the ground cover.

Presently, an adult ibis flushed from a nest built of horseweed and situated a few inches off the ground. It contained four eggs. Slides and a video tape were made of this nest (Fig. 1). Soon, I found two others, each located about 4.5 m from the first nest. As with the first, these nests also were constructed mainly of horseweed supplemented with small twigs and grasses. One of them had three eggs, the other two.

A subsequent visit by the author on 30 June disclosed 14 additional ibis nests containing either eggs or young birds (Fig. 2). A final search on 5 July was conducted by Krey, Winton, Leslie, and me. By thoroughly searching the island, we managed to locate an incredible 23 previously unknown nests, bringing the total to 40.

On 5 July, Winton and Leslie conducted a wandering quarter transect on both the north and south ends of the island in order to determine tree density. This also allowed them to estimate the number of nests for each species using the rookery. Relying on these data, together with their earlier population estimate (161 ibises) on 27 June, I calculated that perhaps as many as 40 other undiscovered nests might have been initiated during the summer of 1995, which would have brought the total number to about 80 nests!

ADDENDUM: Unknown to the author, state game ranger Dakota R. Cagle discovered a White-faced Ibis nest at a Caddo County pond 4 km (2½ mi) north and 18 km (11 mi) east of Binger in late July 1993 (pers. comm.). Cagle initially saw a pair of birds in a willow stand at the swampy upper end of the pond. On several consecutive mornings thereafter, he watched one ibis fly out of these trees. When he searched the willows, Cagle found a nest of reeds and cattails that contained three eggs and that was nestled in the fork of a cottonwood sapling about one m above the water. He checked the nest daily until noting that all three eggs had hatched. Photos were taken of this nest. All five birds remained in the area until early October. In 1994, two ibises returned and may have nested. However, Cagle saw no ibises there in 1995.

In the future, Oklahoma birders should make a point of checking suitable habitat for nesting ibises anywhere in the state during the breeding season.

SALT PLAINS NATIONAL WILDLIFE REFUGE, ROUTE 1, BOX 76, JET, OKLAHOMA 73749, 14 AUGUST 1995.

SPECIES COMPOSITION OF A CICONIIFORM ROOKERY IN NORTHCENTRAL OKLAHOMA

BY

MARCUS T. KOENEN, BRYAN R. WINTON, RONALD S. SHEPPERD, AND DAVID M. LESLIE, JR.

The 3,300-ha Great Salt Plains Reservoir in Alfalfa County, Oklahoma, was created when the United States Army Corps of Engineers dammed the Salt Fork of the Arkansas River in 1941. It is the nucleus of the Salt Plains National Wildlife Refuge (NWR). Ralston Island was created in the north end by the rising water level and encompassed about 60 ha in 1941. Since then, it has gradually eroded away until only about nine ha remained in 1966 and five ha in 1989 (Koenen et al., 1996). In 1995, we estimated that a mere 1.8 ha was still intact. Today, the island is covered with salt cedar (*Tamarix* sp.) and other low-growing woody plants (see description of vegetation in preceding paper) and supports one of the largest heron rookeries in the state.

On 26 June 1995, we circumnavigated Ralston Island in a pontoon boat about 20–30 m from shore and counted nesting birds in 20 transects placed randomly around the island. To minimize disturbances to the nesting birds, we did not go ashore to delimit transects of a uniform length; instead, we ocularly estimated shoreline transects of about 8–10 m each from the boat. Variable length transects were used because we were interested in a single estimate of species composition and not a measure of variation in nesting densities throughout the island. The survey started at 0900 on the northeastern shore of the island and continued clockwise to the northwestern end. Two individuals independently counted all incubating birds in each transect. We stopped the boat at each transect location and waited three to five minutes for birds to resettle if they had been flushed from nests. These data were averaged to calculate species composition of nesting birds.

On 5 July 1995, we conducted two wandering-quarter transects (Catana, 1963) while traversing the island from north to south. We measured distances between 50 nearest-neighbor trees (defined as a living or dead rooted stem) and counted the number of nests per tree on each transect. The wandering-quarter method results in transects of varying length because the goal is to “wander” from one tree to the nearest neighboring tree in a 90° arc (“quarter”) centered on a specific direction (in this case, south) and measure the distances between them. The inverse of the mean area occupied per tree, as calculated from the mean distance between nearest-neighbor trees, provides an estimate of density.

On 7 October 1995, after all breeding birds had left the island, we made a vegetation survey using 18 west-to-east belt transects to determine composition of plants. Each transect was 2 m wide and ranged from 12 m to 110 m, for a total length of 1053 m. Transects differed in length because of the variable width of the island.

Based on the wandering-quarter method, we estimated the mean distance between trees at 2.89 m and the mean number of nests per tree at 5.25. Tree density on Ralston Island was 0.1201 trees/m². Assuming that the island was 18,211.5 m², we estimated the total number of trees at 2,187.2. This figure, multiplied by 5.25 nests/tree, yielded an estimate of 11,482.8 nests on the island. Assuming two adults per nest, we estimated the number of breeding birds on the island at 22,966 (Table 1).

A nest survey in early July of 1982 by Dr. Larry G. Talent and Laura A. Hill (1982) reported the first known breeding of Cattle Egrets (*Bubulcus ibis*) on Ralston Island (ca. 1000 birds). We estimated a breeding population of 19,199 of these birds there in 1995, or a 19-fold increase since 1982. In addition, we noted a 48-fold increase in Little Blue Herons (*Egretta caerulea*) and a 12-fold increase of Black-crowned Night-Herons (*Nycticorax nycticorax*) during this same period. There were about 200 Green Herons (*Butorides virescens*) nesting throughout the island in 1982, but none in 1995.

Because of their high visibility, species with white plumage were easier to count and their numbers may have been overestimated both in 1982 and 1995. By contrast, the darker White-faced Ibises (*Plegadis chihi*) and adult Little Blue Herons flushed easily and may not have always resettled to be counted on a transect. Therefore, we suspect that their numbers were underestimated. Black-crowned Night-Herons also may have been underrepresented because their nests were located toward the interior of dense bushes and thus were difficult to see.

The total number of ciconiiform birds on Ralston Island increased dramatically from approximately 1,240 birds in 1982 to an estimated 22,966 in 1995, despite the island's shrinking size. Population growth was most pronounced among Cattle Egrets, but Little Blue Herons and Black-crowned Night-Herons also showed appreciable gains (Table 1).

Although numbers of some species had grown dramatically since 1982, we found that overall species composition on the island had changed little (Table 1). For example, Cattle Egret composition, 81% in 1982, was 84% in 1995. The percentage of Little Blue Herons and Black-crowned Night-Herons changed from 1.6% of the total each in 1982 to 4.2% and 1.1%, respectively, in 1995.

Population estimates of Great-tailed Grackles (*Quiscalus mexicanus*) were unavailable in 1982, but they constituted less than one percent of the total birds counted in 1995. Four Great Blue Herons (*Ardea herodias*) were tabulated in 1982 and one in 1995, but no nest was discovered. Species found in 1995 but not in 1982 included Snowy Egret (*Egretta thula*), Great Egret (*Ardea alba*), White-faced Ibis and Double-crested Cormorant (*Phalacrocorax auritus*). This was the first year that breeding of the White-faced Ibis had been documented on the refuge (see preceding paper).

Our vegetation survey indicated that salt cedar was the most important species to breeding birds on Ralston Island; it accounted for 64% of the total tree species composition (Table 2). Interestingly, although about 50% of the salt cedars were dead, we found 79% of all nests in live trees. This high percentage may have been attributable to the heavy rains in August 1995 that washed nests out of dead trees more readily than from live ones. Telfair (1994) noted that the build-up of Cattle Egret numbers exacerbates guanotrophication. This process ultimately can kill vegetation, which may lead to abandonment of a rookery. Introduced into North America in the late 18th Century, *Tamarix* has spread throughout the floodplains of most southwestern rivers and reservoirs in the United States (Horton, 1977; Kerpez and Smith, 1987; Koenen et al., *op. cit.*). Specific causes of salt cedar mortality on Ralston Island and its impact on the rookery are not known.

Refuge personnel initiated erosion control measures in 1993 by placing round bales of hay on the southern tip of the island, but these were washed away by

heavy rains during the summer of 1993. More recently, a cement wall extending about 100 m to the northwest from the southern tip of the island has been built. Refuge personnel anticipate that the area will silt in, providing substrate on which vegetation can become established. Because of its attraction to immense numbers of breeding herons and egrets, we contend that additional research and aggressive erosion control on Ralston Island is warranted in the near term.

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Table 1. Proportions of breeding birds on Ralston Island, Salt Plains NWR, Oklahoma, 1982 and 1995. See text for calculations; early data from Talent and Hill, 1982.

Species	Total birds on nests (1995)	Relative % of nests (1995)	Number of adults	
			1982	1995
Cattle Egret	926	83.6	1,000	19,199
Green Heron			200	0
Snowy Egret	61	5.5	0	1,263
Great Egret	50	4.5	0	1,033
Little Blue Heron	47	4.3	20	965
Black-crowned Night-Heron	11	1.0	20	253
White-faced Ibis	8	0.7	0	161
Double-crested Cormorant	4	0.4	0	92
TOTALS			1,240	22,966

Table 2. Species composition of nest trees on Ralston Island, Salt Plains NWR, Oklahoma, 7 October 1995.

Tree Species	% Comp.	% with nests
Salt cedar (dead)	35	8
Salt cedar (live)	29	79
Sumac	29	7
Hackberry	2	4
Honey locust	2	0
Elm	1	1
Cottonwood	1	1
Red mulberry	1	0

GENERAL NOTE

Nest competition in Eastern Meadowlarks — Interspecific and intraspecific nest competition or sharing has been documented in many passerine species (e.g., Holland 1923; Raney 1939; Farber 1972), but I was unable to find any record of intraspecific nest sharing in Eastern Meadowlarks (*Sturnella magna*). Northern Bobwhite (*Colinus virginianus*) eggs have, however, been found in meadowlark nests on a few occasions (e.g., Roseberry and Klimstra 1970). Saunders (*in Bent* 1958) reported that polygyny is frequent in Eastern Meadowlarks, with about 50% of the males in his study having more than one female. Knapton (1988) reported that 66 (64.1%) of the 103 nests he studied belonged to polygynously mated females, and that their nest success was higher than for monogamously mated females. Most blackbirds in North America practice polygyny, with Red-winged Blackbirds (*Agelaius phoeniceus*), Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*), and Great-tailed Grackles (*Quiscalus mexicanus*) usually having three or more females in each male's harem (Orians 1980; Webster 1992). It would seem that polygyny might occasionally lead to intraspecific brood parasitism or nest sharing.

In 1994, I observed two apparent cases of nest sharing or competition in Eastern Meadowlarks in Osage County, northeastern Oklahoma. The first nest was found on 10 May 1994 along a county roadside about a half mile east of Foraker by Gary A. Cress, Charles L. Lamd, Greg S. Um, Yan Wu, and the author. A meadowlark that flushed from the roadside ditch prompted an immediate search for a nest. When the nest was found, a second meadowlark, presumably a female, flushed and revealed a well-domed nest containing nine eggs. Egg measurement revealed two distinct size clusters. Volumes of eggs in one cluster (five eggs) ranged from 5056 to 5594 (mean = 5286.6) mm³, while those in the second (four eggs) ranged from 6143 to 6604 (mean = 6373.0) mm³. Egg volume was calculated using Hoyt's (1979) formula (LxBxBx0.507). The difference in egg volume between these egg sets was significant ($t=9.195$, $df=7$, $p<0.001$). The next day, the nest contained only five eggs, and three additional ones were about one m from the nest. On 20 May, one chick had hatched and all of the remaining eggs were broken. On 24 May the nest was empty and assumed depredated. I speculate that the removal of the eggs was due to competition for the nest between the two females.

A second similar nest, with eight eggs, was located on 6 June 1994 by Lachovia C. Parrish, Stephanie R. Schmidt, Sandy L. Stevens, and the author on the Nature

Conservancy's Tallgrass Prairie Preserve north of Pawhuska. It was discovered when two meadowlarks flushed from it. All eight eggs were similar in size, ranging from 6316 to 6747 mm³ (mean = 6568.9), but the presence of two birds suggested that the nest contained two separate small clutches rather than a single large one. By 10 June, only six eggs remained in the nest. These six hatched by 14 June. On 20 June the nest was empty, and feces in the nest indicated that the young had likely fledged.

Of 420 Eastern Meadowlark nests found by George M. Sutton Avian Research Center personnel in Osage and Washington counties from 1992 through 1994, most held four or five eggs and eight contained six eggs. However, a 1993 nest in Osage County held four eggs during two visits but three more were deposited at least a week after the clutch was completed. This nest was subsequently abandoned.

It would appear that nest sharing is much less common than either intraspecific or interspecific nest parasitism. Many authors have reported instances of species that are not generally brood parasites, i.e., laying their eggs in nests of other species. Harms et al. (1991) documented intraspecific parasitism in Red-winged Blackbirds, Yellow-headed Blackbirds and Brewer's Blackbirds (*Euphagus cyanocephalus*) following nest destruction during the egg-laying period. Perhaps a similar fate occurred in the aforementioned meadowlarks, but due to the large number of eggs and the presence of two birds at each nest, I suggest that two females were either sharing or competing for the same nest. Because some eggs had been removed from the nest before the second visit in both cases, competition may be the most likely explanation and such events may occur more frequently than observations would indicate.

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From the Editor.—The American Ornithologists' Union updates its *Check-list of North American birds* (1983) with supplementary revisions that appear periodically in *The Auk*. In the 40th Supplement recently published (*Auk* 112: 819-830, 1995), several changes are pertinent to Oklahoma birds. The scientific name of the Great Egret is now *Ardea alba*. The word "American" should be dropped from "American Swallow-tailed Kite." "*Pluvialis dominica*" becomes "*P. dominicus*." Both the scientific and common names of the Scrub Jay are changed; "*Aphelocoma coerulescens*" is now "*A. californica*" and the common name is "Western Scrub-Jay." The Spotted Towhee reclaims full species status as "*Pipilo maculatus*." The Sharp-tailed Sparrow that might be seen in Oklahoma is now "*Ammodramus nelsoni*," "Nelson's Sharp-tailed Sparrow," rather than "*A. caudacutus*," the "Sharp-tailed Sparrow." The "Northern Oriole" reverts to two full species, the "Baltimore Oriole" (*Icterus galbula*) and "Bullock's Oriole" (*I. bullockii*). —The Editor.

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