

GENERAL NOTES

Present Status of Some Colonial Waterbird Species in Surinam, South America.—

The coastal area of Surinam, northeastern South America, lies about 6°N and between 54° and 57°W. The coast consists largely of vast tidal mudflats covered on the higher parts with black mangroves (*Avicennia germinans*). The flats alternate in space and time from an accretion to an erosion coast. In a few places, the coast is fringed with a narrow sandy beach. Inland, the coastal fringe is bordered by shallow salt lagoons and brackish swamps. Large expanses of open water are found locally. The lagoons are former *Avicennia* forests in which the mangroves have died after prolonged inundation by sea water. For many years the trunks are a dominant feature.

The coastal area of Surinam forms a favorite breeding area for large numbers of egrets, herons, and ibises. Of the approximately 20,000 pairs of Scarlet Ibises (*Eudocimus ruber*) found nesting between the mouths of the Amazon (Brazil) and Orinoco (Venezuela) rivers in the early 1970's, 13,500 nested in Surinam (Spaans, Biol. Conserv. 7:245–253, 1975). Of the 21 breeding sites with egrets and herons in the young coastal mangroves between these rivers, 9 were in Surinam with an estimated 20,000–30,000 breeding pairs (Spaans, Natuur Landsch. 28:316–328, 1974). The major species in these 9 colonies were the Tricolored Heron (*Egretta tricolor*) and the Little Blue Heron (*Egretta caerulea*), with possibly over 10,000 breeding pairs of each species. Other species regularly found nesting in these colonies were Snowy Egret (*Egretta thula*) (thousands of breeding pairs), Cattle Egret (*Bubulcus ibis*) (a few thousand), Yellow-crowned Night Heron (*Nycticorax violacea*) (thousands), Black-crowned Night Heron (*N. nycticorax*) (at least several hundreds), and Boat-billed Heron (*Cochlearius cochlearius*) (a few thousands). Locally, Scarlet Ibises join these heron assemblages. Scarlet Ibises may, however, also form separate colonies. Although small numbers of Great Egrets (*Egretta alba*) may breed in these mixed heronries, their main breeding sites lie in tall *Avicennia* trees farther inland. Here they form mixed colonies with White-necked Herons (*Ardea cocoi*) and Anhingas (*Anhinga anhinga*). In the early 1970's, about 2500 pairs of White-necked Herons, 1000 pairs of Great Egrets and tens of pairs of Anhingas were found breeding in the coastal area of Surinam.

In this paper we present the results of an aerial survey we made along the Surinam coast in 1980. The objective of the paper is to assess the population trend in some colonial waterbird species since the early 1970's.

On 4 and 5 June the entire coastal zone was surveyed from a plane operating at an altitude of about 150 m. On 6 and 7 June this was followed by on-ground censusing in 4 colonies where the behavior of the birds on 4 June suggested that the birds were breeding, but where no nests could be seen from the air. Estimates were made independently of each other. In all but one case there was a good agreement between our census results, the exception being colony no. 3 (Table 1). The numbers of breeding coastal waterbirds obtained by aerial surveys are a little underestimated (Spaans 1975 and Table 1). Numbers given in this paper are corrected ones, but in Table 1, actual census results are also given.

Figure 1 shows the distribution of the breeding colonies located from the air. The numbered colonies in Figure 1 are identified in Table 1. All coastal breeding colonies (nos. 2, 4–11) were situated in young black mangrove forests bordering the Atlantic. The other 2 colonies were in tall *Avicennia* trees farther inland. In the mangroves bordering the ocean, 8 heronries were active with an estimated total of 10,000–15,000 breeding pairs (Table 1). We located one Scarlet Ibis colony with about 4000 nests. In the swamps farther inland we found 2 heronries with a total of 300–500 pairs of White-necked Herons. In one colony (no. 3) half of the 400–800 breeding pairs were White-necked Herons, the other half Great Egrets. Other species censused along the coast were Roseate Spoonbill (*Ajaia ajaja*) (10s of birds), Wood Stork (*Mycteria americana*) (2260), and Jabiru (*Jabiru mycteria*) (1), all of which were non-breeding birds.

Five of the 8 colonies with various species of small egrets and herons were located near 2 former breeding sites, and probably originated from these colonies. Thus, in fact only 5 areas with one or more colonies were found in 1980, the same number as in 1977, but fewer than in 1971–72 when 8 areas with 9 colonies were located (Spaans 1974). The

TABLE 1. Distribution and abundance of breeding egrets, herons, and ibises along the Surinam coast in June 1980.

Number ^a	Location	Species	Estimated number of breeding pairs		Final estimate
			From the air	On-ground	
1	Fräserpan	White-necked Heron	90, 100 ^c		100
2	Bladholecreek	mixed ^b	several thousands		3000-5000?
3	NE of Wageningen	White-necked Heron, Great Egret	800, 400 ^c		400-800
4	NE of Wageningen	Scarlet Ibis	1900, over 2600 ^c		4000
5	Eastern Coromie	mixed ^b	several hundreds	1000 ^d	1000
6	Eastern Coromie	mixed ^b	a few hundred	< 1000 ^d	500-1000
7	Coppenamepunt	mixed ^b	many hundreds		1000-2000
8	Saramacca	mixed ^b	a few hundred	650, 500 ^{cd}	500-1000
9	Saramacca	mixed ^b	many hundreds	no estimate ^d	1000-2000
10	Saramacca	mixed ^b	a few thousand		2000
11	Wia Wia	mixed ^b	many hundreds		1000-2000

^a Refers to locations marked on Fig. 1.^b Various species of small herons and egrets.^c Estimates BHJdeJ and ALS respectively.^d Mainly Tricolored Heron and Little Blue Heron, followed by Yellow-crowned Night Heron and Snowy Egret.

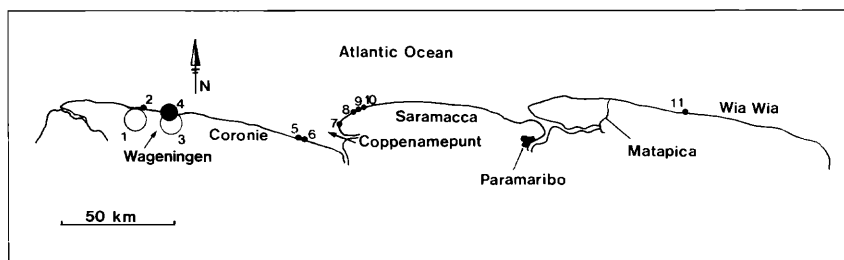


FIGURE 1. Locations of heronries and Scarlet Ibis colony along the Surinam coast in June 1980. The numbered colonies are identified in Table 1. (Small dot = species of small herons and egrets; large dot = Scarlet Ibis; circle = White-necked Heron, Great Egret).

number of breeding birds was also lower than in the 1970's: 10,000–15,000 in 1980 against 20,000–30,000 in 1971–72, a decrease of 50%. The Scarlet Ibis showed an even larger decrease: one colony with 4000 nests in 1980 against 2 or 3 colonies in the 1970's with 6100 (1976) to 13,500 nests (1971) (Table 2). The heron populations in the inland brackish swamps also showed a reduction in numbers. During the early 1970's, 5 breeding colonies with White-necked Herons (2500 pairs) were occupied of which 3 were mixed with Great Egrets (1000 pairs) (Spaans 1974). In June 1980, no colony could be detected in the eastern swamps where 2 were active in the early 1970's. In July, however, L. Autar (pers. comm.) found a colony with about 70 nests of White-necked Herons near Matapica, northeast of the capital Paramaribo, at the same spot where the species nested in the 1970's.

The data show a reduction in numbers for all kinds of colonies. Most probably, the decrease in the numbers of breeding egrets, herons, and ibises in the mangroves bordering the ocean has a natural basis. In Surinam, these birds breed in *Avicennia* forests of 1.5 to 10 m height along an accretion coast. During this study at several locations the mangrove vegetation appeared to have become unsuitable for breeding as a result of erosion or succession. In fact, there was hardly any suitable breeding habitat present along the eastern part of the coast. The succession of accretion and erosion, however, has a cyclic character. So, the situation will probably improve when young mangroves are again covering newly settled mudflats. The decrease in numbers of White-necked Herons and Great Egrets might have been the result of a recent reduction in swamp fish numbers during the last few years. According to information obtained from local people, fewer

TABLE 2. Numbers of Scarlet Ibis breeding pairs along the Surinam coast in 1970–80, based on estimates from the air.^a

Colony location	Number of breeding pairs						
	1970	1971	1972	1975	1976	1977	1980
Wageningen	+ ^b	10,500	6800	2250	3000	1750	4000
Saramacca	0	0	0	2450	0	4000	0
Wia Wia	+	3000	2400	3750	3100	900	0
Total	?	13,500	9200	8450	6100	6650	4000

^a Numbers given are actual census results $\times 1\frac{1}{2}$ (see Spaans 1975).

^b Denotes breeding colony present but number of nests unknown.

Sources: Spaans (1975 and unpublished), this paper (Spaans' estimate).

fish were caught in the Matapica swamps in 1980 than before. As a result nearly all fishermen had left the area. The cause of the reduction in fish numbers is unknown. Further research on the subject is necessary when the situation for the birds does not improve.

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Status of Sibling Aggression in Florida Sandhill Cranes.—Sibling aggression or "cainism" has been frequently reported in chicks of northern, migratory populations of the Sandhill Crane (*Grus canadensis*) (Prill 1922, Hyde 1957, Harvey et al. 1968, Littlefield and Ryder 1968, Miller et al. 1972, Drewien 1973, Miller 1973, Walkinshaw 1973a, 1973b, Quale 1976, Voss 1976, and others); but the status of this behavior in the Florida Sandhill Crane (*G. c. pratensis*), a nonmigratory subspecies and the southernmost population of Sandhill Cranes in the United States, is unknown. During a study of Florida Sandhill Cranes from 1972 through 1979 in an area of south central Florida including all or parts of 10 counties (Charlotte, DeSoto, Glades, Hardee, Hendry, Highlands, Manatee, Okeechobee, Polk, Sarasota), I made a special effort to observe sibling rivalry.

According to Erickson (cited by Miller 1973), sibling aggression in captive Sandhill Crane chicks is pronounced within 2 days after hatching, further increases by day 4 or 5, and subsides after 3 months of age. Thus, I gave particular attention to families with 2 young less than 1 month of age, as sibling rivalry should be most intense during this period. Because young chicks are often difficult to see in heavy cover, I was able to make relatively detailed observations on only 8 family groups with chicks in this age group. Each family was observed on 1 to 6 days for continuous periods of 15 min to 3 h for a total of 15 h. The cranes occurred in improved pastures or native prairie with scattered marshes and patches of pines or hardwoods. The most complete data were provided by a family that could usually be easily observed at distances ranging from 30 to 100 m from a well-travelled road (Layne 1981). I watched this family for periods of 15 min to 3 h each day (total 10 h) from 14 to 19 March. One of the young disappeared, presumably taken by a predator, between 20 and 22 March.

When first observed, the young, estimated to be not more than 2 days old, were with the adult female on an accessory nest platform. The male was nearby. A few minutes later the female walked a short distance away from the nest. During the time the female was with them and after she left, the young moved freely around the nest and rested close together with no sign of animosity. On the following days, the chicks stayed together on accessory nest platforms, sometimes by themselves and sometimes accompanied by an adult, or followed the parents as they foraged near the nest. On the second day, one chick briefly pecked at the other as they accompanied the adults. Thirty minutes later, when the chicks had moved to an accessory nest, they engaged in a vigorous mutual pecking bout that lasted 5 or 6 sec. The adult female, standing beside the nest, ignored the contest. Each chick did an equal amount of pecking, and there was no indication of dominance of one over the other. They appeared to direct their thrusts at each other's beak rather than body. My impression of this behavior was that it was more in the nature of a sparring contest rather than serious fighting. A short time after the pecking bout one of the chicks pecked at a grass stem sticking up from the nest platform in the same way it had pecked at its broodmate's bill earlier. Except for the possibility that the 2 incidents of pecking represented agonistic behavior, I saw no other behavioral interactions between the young that could be interpreted as aggressive during the 6 days they were together.

During the time both chicks were present, the parents made no apparent attempt to keep them separated. The chicks often stayed close together when accompanying the