

STATUS OF TERNS ALONG THE SURINAM COAST

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Although no species of tern is known to breed in Surinam, the coastal area constitutes an important staging area for migrants and nonbreeding birds, most of them from the north. Since the status of these species in Surinam has been described in the literature only in general terms, it may be useful to publish the results of regular counts I made on the coast near Krofajapasi (Fig. 1), about 50 km ENE of Paramaribo, during 1971-72, and other observations elsewhere in the country from 1970 to 1977.

STUDY AREA AND METHODS

The Surinam coast, located about 6°N and between 54° and 57°W, consists largely of vast tidal mudflats, covered on the higher parts with forests of Black Mangrove (*Avicennia germinans*). The flats alternate in space and time from an accretion to an erosion coast, with the latter mostly consisting of a narrow, firm and tough bank of clay layers eroding from older deposits. In a few places, the coast is fringed with a narrow sandy beach. Inland, the coastal fringe is bordered by salt marshes and swamps.

The mud deposited along the coast originates from the Amazon River. This river yearly discharges large amounts of fine sediments into the Atlantic Ocean, which are carried along the Guiana coasts by the WNW moving Guiana current. The mud causes a wide band of very turbid

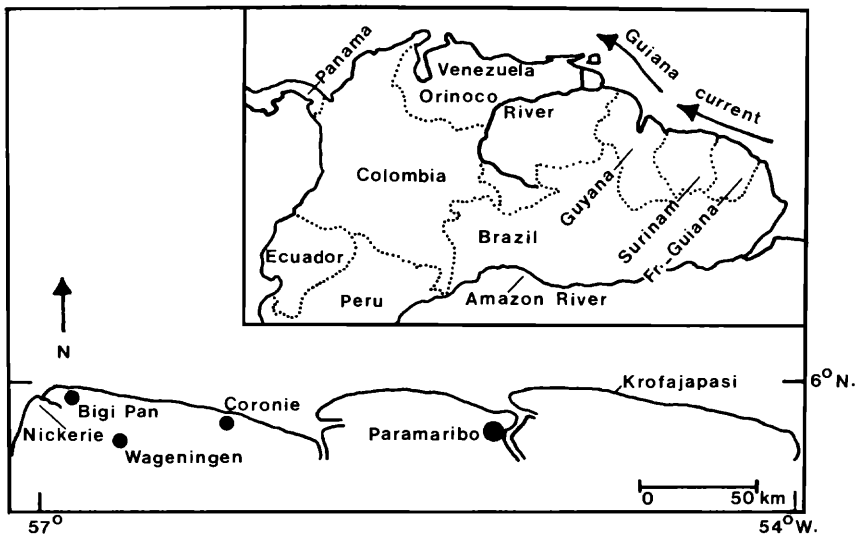


FIGURE 1. Map of the Surinam coast showing the names of places mentioned in the text.

water along the coast. Close to the shore, the Secchi-disc visibility is less than 1 m. The clarity of the water changes gradually with the distance from the coast. At 20–30 km from the coast, the brown color of the muddy water changes abruptly into the bluish-green color of the much clearer shelf water (Eisma and Van Bennekom, 1971). The near-shore surface water contains an admixture of fresh water from the local rivers, locally resulting in salinities far below 35‰. River runoffs vary with the amount of rainfall. Surface water temperatures are about 27°C, with only small variations. The near-shore zone of muddy water has relatively high nutrient concentrations, resulting from an active mineralization of organic matter. The latter originates largely from terrestrial vegetations. Primary production, however, is relatively low, because light penetration is poor. A belt of relatively high primary and secondary production is situated outside this muddy coastal water (Cadée, 1975).

Surinam has a tropical climate. In Paramaribo, mean monthly air temperatures range from 26.4°C in January to 28.5°C in September and October. The amount of rainfall varies seasonally. Most rain falls in April through July (long rainy season) with the least rain in September through November (long dry season). Between November and April, there is a short rainy season (December and January) and a short dry season (February and March), both with a moderate mean monthly precipitation (Meteorologische Dienst, 1965). There is, however, much variation in the onset of the seasons from year to year.

The Surinam coast lies alternately in the northeast and southeast trade wind belts, or on the division between the two. From December through the beginning of April, the northeast trade wind blows strongly on the coast. In these months, the swell is heaviest and the surf strongest. The most important movements of the sandy beaches occur from December through February. From April through June, the wind becomes more variable and the percentage of calms increases. From June through August, the southeast trade wind is slight. In November and December, it gives way to the more definite and stronger northeast trade wind that causes the heavy swell during the winter months (Schulz, 1975).

The study near Krofajapasi was conducted from January 1971 through November 1972. Within 8 km east and west of the Forest Service field station at Krofajapasi, I selected four counting areas: (1) a 3½-km-long sand spit west of the field station; (2) an 8-km-long sandy beach east of it; (3) a complex of lagoons behind the beach at the eastern end of area 2; and (4) a lagoon and a nearby mudbank across the creek near the field station. Counts in area 2 were mainly of foraging terns or of birds flying between inshore feeding areas and roosts on the beach and in the lagoons, those in areas 1, 3 and 4 mainly of resting birds. Habitats used by terns for feeding and resting are summarized in Table 1. Each area was visited for one or more days at intervals of 2–4 weeks. Counts were made at various times of the day and at various tide levels. As a result, numbers counted varied highly from one day to another.

TABLE I
Habitats used by terns for feeding (F) and resting (R) in Surinam.

| Species | Habitats | | | | | | | | | | |
|--------------------|---------------------------------|--|--------|----------------------------------|---------------|------------|------------------|---------------|--|-----------------|---------------------|
| | offshore waters (incomplete) | inshore waters and estuaries of large rivers | creeks | lower courses of large rivers | sandy beaches | clay banks | exposed mudflats | muddy lagoons | shallow lagoons with sandy and muddy islets | brackish swamps | freshwater habitats |
| Black Tern | | F | | | R | | | R | R | F/R | F ¹ |
| Large-billed Tern | | F/R ² | | F | R | | R | R | R | F/R | F |
| Gull-billed Tern | | F | | F | F/R | R | F/R | F/R | F/R | F/R | F |
| Common Tern | | F/R ² | | | R | | R | R | R | | |
| Sooty Tern | F | | | | | | | | | | |
| Yellow-billed Tern | | F/R ² | F | F | R | R | F/R | R | F/R | F/R | F |
| Least Tern | | F/R ² | F | | R | | F/R | R | F/R | R | |
| Royal Tern | | F | | | R | | | R | R | | |
| Cayenne Tern | | F | (F) | | R | | | R | R | | |
| Brown Noddy | F | | | | | | | | | | |

¹ During the summer only.

² On stakes of fishing-nets.

For each species, maximum numbers for each month were summed for the four areas to obtain a relative picture of the seasonal fluctuations in numbers. Special counts during observations made elsewhere along the coast during 1970-73 and 1975-77 have been incorporated in the text where relevant. Throughout the paper, seasonal terms refer to Northern Hemisphere conditions.

ANNOTATED LIST OF SPECIES

Black Tern (*Chlidonias niger*)

According to Haverschmidt (1968:120), the species is an uncommon migrant from the north (17 August-1 February).

In late summer and fall, small flocks (15 birds per group being the highest number) were regularly seen in the Krofajapasi area, either passing east over the sea or resting in lagoons and on beaches (Table 2). My fall sightings for this species are between 3 August (1 bird) and 31 October (about 15 birds). These dates match rather well other fall reports of the species along the northeastern coast of South America (French, 1973:169; Van Halewijn, 1973b). Several birds in August and September were still almost in full breeding plumage. Outside the fall

period, I observed the species twice. On 6 May 1971, 4 birds, 2 of which were in fresh breeding plumage, were seen near Krofajapasi. On 19 June 1975, about 28 Black Terns in nonbreeding and intermediate plumage (1 of which almost in breeding plumage) were observed in the brackish and freshwater swamps of the Bigi Pan in northwestern Surinam. As far as I know, summering birds have not been reported previously from northeastern South America. The species has only occasionally been observed during the winter (Haverschmidt, 1968; B. H. J. de Jong, pers. comm.).

According to the A.O.U. Check-list (1957:243), Surinam is the extreme south extension of the species' range in the western Atlantic. Since the species does not occur offshore during the winter (Van Halewijn, in litt.), I conclude from my counts that its winter range extends farther to the south than indicated. The preference for salt water during the nonbreeding season contrasts with the habitat choice during the breeding season, when the species is almost an obligate freshwater bird.

Large-billed Tern (*Phaetusa simplex*)

Haverschmidt (1968:121) records this species as a very common nonbreeding visitor, which is present throughout the year.

In the study area, Large-billed Terns were seen from April through September with highest numbers in June and July (Table 2). From 1 June 1971 through 31 May 1972, I also recorded all Large-billed Terns I observed elsewhere in Surinam, as follows:

| | J | F | M | A | M | J | J | A | S | O | N | D |
|---------|---|---|---|---|----|----|----|----|----|----|---|---|
| Numbers | 3 | 2 | 4 | 1 | 81 | 70 | 75 | 20 | 19 | 20 | 1 | 1 |

My data show that only from May through October is the species present in any significant numbers. As far as we know, this South American species does not breed in Surinam. The reason is unknown. The low numbers seen from November through April, a period in which Large-billed Terns have been found breeding on a sandbank in the Rupununi River in Guyana (Davis, 1935) and in the Orinoco region (Cherrie, 1916), further reinforce the impression that in Surinam the species is a nonbreeding visitor only. On 14 January 1971, I observed a calling bird flying over the Wageningen rice polders with food in its bill.

As a breeding bird, the Large-billed Tern is an obligate freshwater bird. As a nonbreeding bird, the species occurs in both freshwater and coastal habitats (Table 1). In Wageningen and Nickerie, northwestern Surinam, the species was seen feeding over wet rice fields.

Gull-billed Tern (*Gelochelidon nilotica*)

According to Haverschmidt (1968:122), this species is a regular migrant from the north, present all through the year.

In the Krofajapasi area, the species was seen throughout the year with

highest numbers in March and in August and September (Table 2). During the summer and winter, it was present in fair numbers. Although common on the seacoast, Gull-billed Terns were rarely observed feeding at sea. Coastal feeding habitats included mainly exposed mudflats and muddy lagoons, where I observed them feeding on fiddler crabs (*Uca* spp.); salt marshes and swamps with areas of open water; and overgrown beach platforms, where they were assumed to feed on insects. In the long dry season, when the lagoons dry up and many fish die, flocks of several 10's of birds may assemble at places where dead and dying fish are floating.

The species is not confined to the coastal fringe. Farther inland, it is also common on wet and flooded rice fields. For example, 29 October 1970, late in the afternoon, I counted at least 1,000 Gull-billed Terns flying from the Wageningen rice polders to their nightly roost(s) outside the polders. Since only part of the roosting flight could be surveyed, the total number of birds must have been much higher. On 25 March 1971, over 48 ha of wet rice fields in these polders, I counted 350 feeding Gull-billed Terns (7.3 birds/ha).

Gull-billed Terns breed in both North and South America. South American breeding birds (*gronvoldi*) are considered to have a larger bill and longer wings than North American *aranea* (Mathews, 1912:330-331; Hellmayr and Conover, 1948:299), but see also Murphy (1936:1092) and Escalante (1970:152). The bill and wing lengths of 10 birds from Surinam present in the Leiden Museum are as follows:

| Age | Sex | Exposed culmen (mm) | Max. wing chord (mm) | Months |
|--------|-----------------|---------------------|----------------------|---|
| Imm. | 3 ♀ ♀, 2 ? | 33-36, 39.5 | 273-280 | Sept., Oct. (3x), March |
| Adults | 3 ♂ ♂, 1 ♀, 1 ? | 37-39.5 | 288-290, 301 | Sept. ¹ , Oct. ² , Nov. ¹ , Dec. ¹ , April ³ |

¹ = nonbreeding plumage, ² = worn breeding plumage, ³ = fresh breeding plumage.

These measurements are not different from those of typical *aranea*. The recovery from Surinam of a bird banded as a nestling in U.S.A. (Haverschmidt, 1968:122) further reinforces the impression that birds visiting the Surinam coast are migrants from the north rather than from the south. According to Snyder (1966:99), Gull-billed Terns along the Guyana coast would belong to *gronvoldi*. French (1973:171), however, considers birds visiting Trinidad as belonging to *aranea*.

Common Tern (*Sterna hirundo*)

Haverschmidt (1968:123) records this species as a not very numerous migrant from the north, with many immature birds spending the summer here.

Near Krofajapasi, this species was recorded in all months, except March, with peak numbers in June, August and November (Table 2).

TABLE 2
Monthly maxima of terns in the Krofajapasi area in 1971-72.

| | J | F | M | A | M | J | J | A | S | O | N | D |
|--------------------|----|-----|------|----------------|-----|-----|----|-----|-----|-----|-----|----|
| Black Tern | | | | | 4 | | | 15 | 18 | 2 | | |
| Large-billed Tern | | | | 1 | 18 | 43 | 75 | 15 | 11 | | | |
| Gull-billed tern | 89 | 121 | 212+ | 38 | 38 | 59 | 9 | 180 | 288 | 85+ | 72 | 18 |
| Common Tern | 4 | 21 | | 8 | 9 | 40+ | 5 | 80 | 8 | 20 | 80+ | 16 |
| Yellow-billed Tern | 11 | 6+ | 89+ | + ¹ | 49+ | 36+ | | 3 | 28 | 16 | 5 | |
| Least Tern | 1+ | 21 | 25+ | 5+ | 132 | 32+ | 8 | 123 | 111 | 44 | 1 | |
| Royal Tern | 1 | 1 | 1 | 2 | 1 | 8 | 3 | 2 | 2 | | | |
| Cayenne Tern | 1 | 33 | 58 | 140 | 84+ | 176 | 41 | 36 | 421 | 19 | 1 | |

¹ + = present in unknown numbers.

I also recorded a large flock of 250 birds on the beach of Coronie in the northwest of the country on 29 July 1971.

Birds fed nearly exclusively at sea (Table 1), but, on an average, not so close to the shore as Least and Yellow-billed terns. In the stomachs of two Common Terns shot by a local hunter on the beach near Coronie on 11 October 1970, I found two unidentifiable fish, and remnants of fish and crabs, respectively. The two birds, both females, probably in their 2nd year, had maximum wing chord lengths of 264 and 267.5 mm, and weighed 125 and 130 g.

In the New World, the species breeds in North America, the Antilles, and off Venezuela. The nearest breeding colony is situated on Los Roques (LeCroy, 1976). Many Common Terns banded in U.S.A. have been recovered in Surinam (Bird Banding Laboratory, in litt.), indicating that Surinam is within the normal wintering area of North American birds.

Although I was on the lookout for Roseate Terns (*Sterna dougallii*), I did not locate any. This species has not been reported from Surinam in the literature, but data from the Bird Banding Laboratory indicate that several Roseate Terns banded in U.S.A. have been recovered in Surinam.

Yellow-billed Tern (*Sterna superciliaris*)

According to Haverschmidt (1972), the species is present along the coast in great numbers throughout the year.

Near Krofajapasi, this species was recorded in all months, except July and December, with highest numbers present from March through June and in September (Table 2). Most probably, numbers were higher than indicated in the table, because in dense flocks of roosting terns, it was

not always possible to distinguish this species from the Least Tern. Elsewhere along the coast, I did see Yellow-billed Terns in July and December and recorded flocks of several 10's in October and November.

This South American species has never been found breeding in Surinam, but it might do so (Haverschmidt, 1972). Haverschmidt's data indicate that the birds visiting the Surinam coast breed during November–February, which may account for the relatively low numbers present there during the winter and the relatively high numbers seen afterwards. In Guyana, the species starts to breed in November (Davis, 1935).

As a breeding bird, the Yellow-billed Tern is confined to freshwater habitats (Haverschmidt, 1972). As a nonbreeding bird, it also occurs in coastal habitats (Table 1). In Wageningen and Nickerie, northwestern Surinam, the species was seen feeding over wet rice fields.

Least Tern (*Sterna albifrons*)

Haverschmidt (1968:125) records this species as a quite common migrant from the north, which is present throughout the year, many immature birds spending the summer here.

In the Krofajapasi area, the species was recorded in all months, except December, with highest numbers in May and in August and September (Table 2). Elsewhere along the coast, relatively high numbers were also recorded in July. I have no observations of Least Terns anywhere in Surinam between 29 November and 22 January.

Least Terns were mainly observed feeding at sea close to shore, but I also observed birds fishing over exposed mudflats and shallow lagoons (Table 1). In the stomachs of three Least Terns shot by a local hunter on the beach near Coronie on 11 October 1970, I found 34 small shrimps (*Palaemon schmitti*), 3–5 fish larvae belonging to the family Sciaenidae, and 1 small unidentifiable fish. The three birds (1 ♀, 2 of unknown sex, all at least one year old) had maximum wing chord lengths of 167, 166 and 168 mm, and weighed 41.5, 42.5 and 45.5 g, respectively.

It is unknown from where the Surinam birds come. The nearest breeding colonies are in the south Caribbean off Venezuela (Phelps and Phelps, 1958:113).

Royal Tern (*Sterna maxima*)

According to Haverschmidt (1968:126), this species is a common migrant from the north, which is present throughout the year, many immature birds spending the summer here.

In the Krofajapasi area, Royal Terns were seen in all months, except October through December, with a small peak in June (Table 2). Elsewhere along the coast, I also recorded peak numbers for 1971–72 in July:

| | J | F | M | A | M | J | J | A | S | O | N | D |
|---------|---|---|---|---|---|---|----|---|---|---|---|---|
| Numbers | – | – | – | 2 | 5 | 6 | 31 | 1 | – | – | 5 | – |

The species fed exclusively at sea (Table 1). On 2 November 1971, I observed Royal Terns feeding on juvenile *Mugil* spp.

Royal Terns breed in both North and South America. It is unknown to which population(s) the Surinam birds belong. The nearest breeding colonies are on Soldado Rock off Trinidad (ffrench, 1973:180) and Los Roques off Venezuela (Phelps and Phelps, 1958:113). The reason why the species does not breed in Surinam may be the absence of suitable breeding sites.

Cayenne Tern (*Sterna sandvicensis eurygnatha*)

Haverschmidt (1968:126) records this species as a common bird present throughout the year.

Near Krofajapasi, this species was seen in all months, except December, with highest numbers from April through June, and in September (Table 2). Elsewhere along the coast, I observed the species only twice (possibly the same bird) during December, further reinforcing the impression that it is extremely scarce during the winter.

The species feeds nearly exclusively at sea, probably mainly out of sight of the shore. Once, I observed a Cayenne Tern feeding over a creek.

Bill coloration varied considerably. Of 58 birds seen in February through May 1971, 18 (31%) had a yellow bill and 4 (7%) a black bill. In at least one of the latter birds the bill had a yellow tip. In 36 birds (62%) the bill showed varying amounts of yellow and black. Feet color of the birds investigated was black or black with varying amounts of yellow. Once I saw a bird with yellowish legs. The high percentage of birds with black-spotted bills indicates intergradation or hybridization with the Sandwich Tern (*S. s. acuflavida*).

Cayenne Terns breed off the eastern coast of South America from the Netherlands Leeward Islands through Brazil. The reason why the species does not occur as a breeding bird along the Surinam coast may be the absence of suitable breeding sites. On the sand spit near Krofajapasi, I observed a few times roosting birds attempting to copulate. Once I saw a bird flying to the roost on the sand spit near Krofajapasi with a fish in its bill.

Brown Noddy (*Anous stolidus*)

Haverschmidt (1968:127) lists two records (21 December 1963 and 30 November 1966). There is a third specimen from Surinam—light vessel Surinam River, 3 June 1969—present in the Leiden Museum (G. F. Mees, in litt.). I received an adult bird found ill on the beach near Krofajapasi about 25 February 1971 (specimen in the Zoological Museum, Amsterdam). The origin of these birds is unknown. The nearest breeding colonies lie off Trinidad and Tobago (ffrench, 1973:181). The species is a common breeding bird in the western Atlantic.

DISCUSSION

No species of tern is known to breed in Surinam. I therefore consider all species observed as migrants and nonbreeding birds from elsewhere:

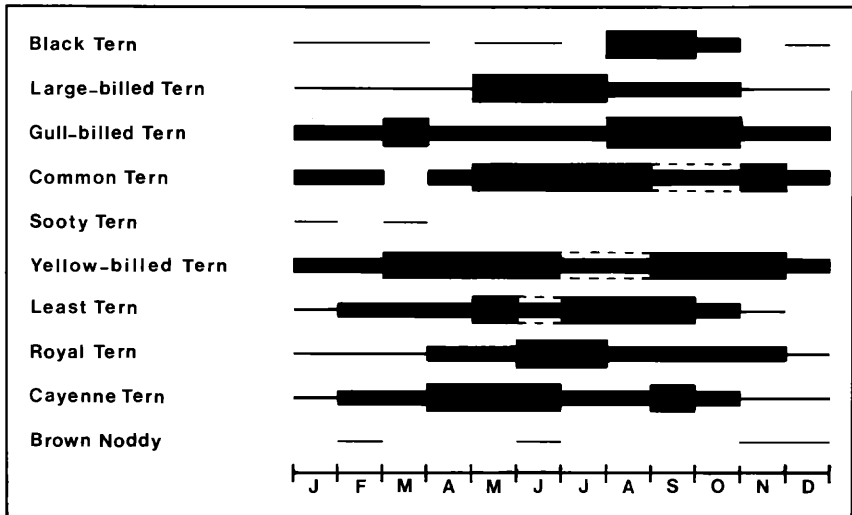


FIGURE 2. Annual pattern of occurrence of terns along the Surinam coast. Solid line = occasionally occurring or present in relatively small numbers; small solid bar = present in moderate numbers; large solid bar = present in high numbers; large open bar = probably occurring in high numbers.

the Large-billed Tern and the Yellow-billed Tern from other parts of South America, the Black Tern, Gull-billed Tern, Common Tern, Least Tern, Royal Tern and the Cayenne Tern from North America and/or the Caribbean. There is no proof of the presence of Gull-billed Terns, Royal Terns and Cayenne Terns from southern breeding populations, although this possibility cannot be fully ruled out.

Roosting sites of terns are distributed rather unevenly along the coast. Therefore, only a rough estimate of the total Surinam populations of the various species can be given. Based on the Krofajapasi counts and the observations I made elsewhere along the coast, I estimate that maximum numbers for the Gull-billed Tern may possibly amount to over 10,000, for the Common Tern, Yellow-billed Tern, Least Tern and the Cayenne Tern to 1,000–10,000 (with the last three more numerous than the first species), and for the Black Tern, Large-billed Tern and the Royal Tern to less than 1,000. The Sooty Tern (*Sterna fuscata*) and the Brown Noddy visit the Surinam coast only accidentally (Haverschmidt, 1968:124 and 127), but occur commonly at open sea off this coast (Van Halewijn, 1973a and in litt.). These pelagic species clearly avoid the muddy coastal waters of the Guianas (cf. Watson, 1966:96).

The annual pattern of occurrence of terns along the Surinam coast is summarized in Figure 2. This figure shows that numbers of terns vary greatly through the year. The numbers are lowest during the winter, when the northeast trade wind blows strongly on the coast and the swell

is most heavy, and highest during the spring and summer when the sea is calm. In fact, only three species are present in fair numbers during the winter (Fig. 2). Of these species, only the Common Tern feeds exclusively at sea.

In the beginning of the 20th century, the Black Tern, Large-billed Tern, and the Yellow-billed Tern were reported as common along the Surinam coast, the Gull-billed Tern, Common Tern, Least Tern, Royal Tern and the Cayenne Tern as scarce (Penard and Penard, 1908:28–45). Half a century later, the last five species had increased in relative abundance (cf. Haverschmidt, 1955:56–57 and 1968:122–126). All species, except the Royal Tern, are still present in fair or good numbers. The Royal Tern seems to have decreased dramatically in numbers since the mid-1960's. In the early 1950's, the species was one of the commonest terns along the coast near Coronie, northwestern Surinam (Haverschmidt, 1955:57 and in litt.). It was still mentioned as common by Haverschmidt (1968:126). During 1971–72 and 1975–77, the species was seen regularly, but in very small numbers only, both near Krofajapasi and elsewhere along the coast. In fact, it is now one of the rarest species in the mixed flocks of roosting terns along the coast. The cause of this decline in numbers is unknown.

SUMMARY

Regular counts of terns made on the coast of Surinam during 1971–72 showed that of the species regularly occurring, only the Gull-billed Tern, Common Tern, and the Yellow-billed Tern remain during the northern winter in fair numbers. The Black Tern, Large-billed Tern, Least Tern, Royal Tern, and the Cayenne Tern, however, occur only occasionally or are present in small numbers during that season, a period which is characterized by a strongly blowing northeast trade wind. During the northern summer, when the sea is calm, all species, except the Black Tern, which was only seen once during this season, are present in fair or good numbers. Maximum numbers of the Gull-billed Tern were estimated at possibly over 10,000, of the Common Tern, Yellow-billed Tern, Least Tern and the Cayenne Tern at 1,000–10,000, and those of the Black Tern, Large-billed Tern and the Royal Tern at less than 1,000. Royal Terns seem to have decreased in numbers since the mid-1960's.

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LITERATURE CITED

- American Ornithologists' Union. 1957. Check-list of North American Birds. 5th ed. Baltimore, Amer. Ornithol. Union.
- CADEE, G. C. 1975. Primary production off the Guyana coast. *Neth. J. Sea Res.*, **9**: 128-143.
- CHERRIE, G. K. 1916. A contribution to the ornithology of the Orinoco region. *Brooklyn N.Y. Mus. Inst. Arts Sci. Bull.*, **2**: 133-374.
- DAVIS, T. A. W. 1935. Some nesting notes from the savannas of the Rupununi District, British Guiana. *Ibis*, (13)**5**: 530-537.
- EISMA, D., AND A. J. VAN BENNEKOM. 1971. Oceanographic observations on the eastern Surinam shelf. *Hydr. Newsl., Spec. Publ.*, **6**: 25-55.
- ESCALANTE, R. 1970. Aves Marinas del Rio de la Plata. Montevideo, Barreiro & Ramos.
- FRENCH, R. 1973. A Guide to the Birds of Trinidad and Tobago. Wynnewood, Livingston Publishing Company.
- HAVERSCHMIDT, F. 1955. List of the birds of Surinam. *Publ. Sci. Res. Surinam Neth. Ant.*, Utrecht, No. 13.
- . 1968. Birds of Surinam. Edinburgh and London, Oliver & Boyd.
- . 1972. Notes on the Yellow-billed Tern *Sterna supercilialis*. *Bull. Brit. Orn. Club*, **92**: 93-95.
- HELLMAYR, C. E., AND B. CONOVER. 1948. Catalogue of birds of the Americas. *Field Mus. Nat. Hist., Zool. Ser.* 13. Part 1. No. 3.
- LECROY, M. 1976. Bird observations in Los Roques, Venezuela. *Am. Mus. Novit.*, **2599**: 1-30.
- MATHEWS, G. M. 1912. The Birds of Australia. Vol. 2. London, Witherby & Co.
- METEOROLOGISCHE DIENST. 1965. Climatological tables various elements Paramaribo. Period 1931-1960, monthly means. Serie 3. No. 2. 2nd ed.
- MURPHY, R. C. 1936. Oceanic Birds of South America. New York, Am. Mus. Nat. Hist.
- PENARD, F. P., AND A. P. PENARD. 1908. De Vogels van Guyana (Suriname, Cayenne en Demerara). Vol. 1. Paramaribo, Wed. F.P. Penard.
- PHELPS, W. H., AND W. H. PHELPS, JR. 1958. Lista de las aves de Venezuela con su distribucion. No Passeriformes. *Bol. Soc. Venezolana Cien. Nat.*, No. 90.
- SCHULZ, J. P. 1975. Sea turtles nesting in Surinam. *Verhand.*, Stinasu, Paramaribo, No. 3.
- SNYDER, D. E. 1966. The Birds of Guyana. Salem, Peabody Museum.
- VAN HALEWIJN, R. 1973a. Kittiwake *Rissa tridactyla* off the coast of Surinam. *Ardea*, **61**: 189.
- . 1973b. Black Tern *Chlidonias niger* in the South Caribbean Sea. *Ardea*, **61**: 189-191.
- WATSON, G. E. 1966. Seabirds of the Tropical Atlantic Ocean. Washington, Smithsonian Press.

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