DEPARTURE OF TERNS IN SPRING 1999 FROM NAMIBIA

Guido O. Keijl

Keijl G.O. 2003. Departure of terns in spring 1999 from Namibia. Atlantic Seabirds 5(3): 111-118. *During a study of terns wintering along the Namibian coast in February-April 1999, departing terns were recorded. Most terns departed in the evening when other terns went to roosts. Departing flocks consisted only of Sandwich* Sterna sandvicensis, *Common* S. hirundo *and White-winged Black* Chlidonias leucopterus *Terns, of which the first two species originate from north-western European breeding grounds. A major drop in roosting numbers occurred from late February onwards and also a decline in body mass of Common and Sandwich Terns was noted during this period, while departure was observed from early March onwards. Even though the observational data are anecdotal, they suggest that the three tern species migrate not only at night, but also that they may well cross at least part of their route in a straight line. The dominant tern migration strategy remains obscure, but time constraints seem an unlikely cause of jump migration. The jump migration strategy might indicate that the number of suitable stop-over sites is limited.*

Brederodestraat 16a, NL-1901 HW Bakkum, The Netherlands, E-mail: guido@hetnet.nl; WIWO, P.O. Box 925, 3700 AX Zeist, The Netherlands

INTRODUCTION

Palearctic terns migrating between the northern hemisphere and the southern part of Africa seemingly face a tight time schedule. Flight feathers are moulted, which takes several months (Stresemann 1963), and they have to complete this moult in the wintering areas or at stop-over sites. Migration of terns as known to most observers takes place along the coast at altitudes up to some tens of metres above sea level (Marr & Porter 1992; Krüger & Garthe 2001). This type of low-level migration may involve thousands of birds per day, both in spring and autumn (Camphuysen & van Dijk 1983; Johansson & Jakobsson 1997). Terns are also known to migrate at night (Grimes 1977; Lambert 1988) and over land (Jellmann & Vauk 1978; Camphuysen 1992), however, but the extent of it remains largely unknown. Alerstam (1985) observed migrating Common *Sterna hirundo* and Arctic Terns *S. paradisaea* leaving Sweden in autumn at great altitude and supposed that terns try to cover large distances in one flight, just as waders (Piersma *et al.* 1990). Little is known about high-altitude migration in terns. Departing Black Terns *Chlidonias niger* and Common Terns from Lake IJsselmeer in autumn ascend to great heights before moving S or SW (Schouten 1982; Lensink *et al.* 2002). High-altitude migration has not been described for

terns in spring, and not at all for Sandwich Terns *S. sandvicensis* and White-winged Black Terns *C. leucopterus*. Lambert (1988) mentioned individual terns or tern flocks coming down at night from 'great altitude' to his well-lit observation post at sea in the Gulf of Guinea in spring, indicating that terns pass this area at high altitude at night.

In this contribution, observations from Namibia in spring 1999 are presented, where departing tern flocks were seen to ascend to great altitudes. From a review of available data, it is suggested that this type of high-altitude long-distance migration in terns wintering in Africa could be a common phenomenon.

METHODS

A project on Palaearctic terns was carried out by the Avian Demography Unit (ADU) and Foundation Working Group International Wader and Waterbird Research (WIWO) in Namibia, 1 February-2 April 1999 (Arts *et al.* in prep.). Observations were done along the coast between Walvis Bay and a saltpan complex just north of Swakopmund, Namibia. In Swakopmund, terns were ringed. Departing tern flocks were mainly discovered while counting roosting terns. Flight altitudes and flight direction were estimated by eye.

OBSERVATIONS

In March we noticed several tern flocks leaving the study area. Only three tern species of Eurasian breeding origin were involved: Common Tern, Sandwich Tern and White-winged Black Tern. Other terns present in the area were Eurasian Black Tern and the southern African Damara *S. balaenarum*, Swift *S. bergii* and Caspian Terns *S. caspia*. The detailed observations are presented below:

- 4 March – Yacht Club (Walvis Bay), 19:30 hrs, compact flock of four White-winged Black Terns leaving towards the N, discovered when at considerable altitude, continuing to climb until out of sight (estimated at four kilometres distance).
- 6 March – Mile4 Saltworks (Swakopmund), 20:00 hrs, compact flock of approx 50 Sandwich Terns left silently from the roost, flying N and ascending steeply.
- 8 March – Yacht Club, 18:10 hrs, compact flock of 18 White-winged Black Terns discovered overhead at 1000 m by their agitated calls, flying NE. The terns continued to ascend and did not change direction until out of sight.
- 9 March – sewage ponds at Walvis Bay, 19:15 hrs, compact flock of 28 White-winged Black Terns heading NW, flying at great altitude and still ascending.

- 11 March – Langstrand (between Walvis Bay and Swakopmund), 07:30 hrs, 8 Sandwich Terns, calling agitatedly and circling higher and higher until they disappeared in the clouds.
- 11 March – Yacht Club, 18:10 hrs, tight flock of 31 White-winged Black Terns discovered when already at considerable altitude, circling higher and higher and split in two flocks. One flock of 21 individuals left towards the NE, the other flock could not be followed). No calls heard.
- 11 March – Yacht Club, 18:20 hrs, five Sandwich Terns circled higher and higher, calling intensely, disappearing in the mist.
- 15 March – Mile4 Saltworks, 18:20 hrs, compact flock of about 130 Common Terns flew around calling for a while, gradually attaining height until they levelled off at considerable altitude and headed out (direction not noted).
- 16 March – Mile4 Saltworks, *c.* 20:00 hrs, compact flock of 25 Common Terns left the roost just before dark towards the NW.
- 18 March – Walvis Bay Saltworks, 18:00-18:05 hrs, flocks of 4, 3, 2, and 3 Sandwich Terns departed towards the NNW. All birds climbed in tight circles calling continuously and rose to about 200-300m altitude before levelling off. The earliest birds seemingly waited for the later departing birds to join them.
- 18 Mar – Walvis Bay Saltworks, 18:00-18:05 hrs, compact flock of 5 Common Terns ascended steadily and left in NNW direction.

Apparent arrival of terns was observed twice:

- 6 Mar – Mile4 Saltworks, 17:50 hrs, 6 Sandwich Terns, discovered by chance through binoculars, became discernible at an estimated 3 km altitude in a clear blue sky.
- 11 Mar – Walvis Bay, 18:38 hrs, 6 Sandwich Terns appeared from the clouds at probably 1.5 km altitude and quickly descended. They continued low over the water in N direction.

DISCUSSION

As departing terns in Namibia were discovered by chance it is likely that many left unnoticed. Prior to 4 March, departing flocks have probably been overlooked because no attention was paid, even though numbers at the roost in Walvis Bay dropped steeply from 25 February onwards. A drop in body mass of Black, Common and Sandwich Terns was noted, probably indicating that the heaviest individuals had departed (*cf.* Zwarts *et al.* 1990). It is unknown what triggered the terns' departure in spring 1999. They may have left because of changing feeding conditions, for the departure coincided with an influx of warmer water from the north – a phenomenon occurring regularly in the Benguelan system (Shannon *et al.* 1986).

Sandwich and Common Terns from Namibia departed towards the NW or N, White-winged Black Terns towards the NW (one flock), N (one flock) and

NE (two flocks). If birds fly straight N from Walvis Bay they soon find themselves flying over land, to meet the sea again in Central Angola. If terns migrate at night and/or at great altitude there is no need for them to fly over sea. Considering the distance, it is unlikely that terns will cover the entire stretch from Namibia to Europe in one flight (Table 1). The West-African coast, where large numbers of terns occur in winter and spring (Brenninkmeijer *et al.* 2002) is a suitable stop-over site, whereas the Gulf of Guinea seems to be used mainly in autumn (Grimes 1977; Houghton & Mensah 1978; Lambert 1988). On their way from Namibia to the West-African coast the terns would probably cross the Gulf of Guinea quickly.

Table 1. Calculated time needed (h) by terns on their way from Namibia to the African West coast, and from Namibia to West-Europe, assuming a straight line or when following the coastline. Flight speeds from [1]Alerstam (1985) and [2]Gudmundsson et al. *(1992), [3]Brenninkmeijer & Stienen (1994), [4]Stienen & Brenninkmeijer (1994), and [5]Van der Winden & Schobben (2001). 'Commic tern' = Common or Arctic* S. paradisaea *Tern.*

Tabel 1. Berekening van de benodigde vliegtijd (uren) voor sterns van Namibië naar de Afrikaanse westkust en van Namibië naar West-Europa, indien afgelegd in een rechte lijn of langs de kust. Min en max vliegsnelheid van [1]Alerstam (1985), [2]Gudmundsson et al. *(1992), [3]Brenninkmeijer & Stienen (1994), [4]Stienen & Brenninkmeijer (1994) en [5]Van der Winden & Schobben (2001). 'Commic Tern' = Visdief of Noordse Stern.*

	Namibia - Senegal		Namibia – West Europe	
	straight line	along coast	straight line	along coast
	5,500	8,000	8,500	14,000 km
'Commic' Tern[1] 40 km h^{-1}	138	200	213	350
'Commic' Tern[2] 56 km h^{-1}	98	143	152	250
Sandwich Tern[3] 24 km h^{-1}	229	333	354	583
Sandwich Tern[4] 66 km h^{-1}	83	121	129	212
Black Tern[5] 50 km h^{-1}	110	160	170	280

It is very well possible that Sandwich and Common Terns leaving Namibia make use of the predictable SE trade-winds to quickly migrate to West-Africa and skip the Gulf of Guinea. Extra weight is probably not just 'fuel' but also 'insurance' if unfavourable conditions are met with, for instance in rough weather on arrival (*cf.* Dunn 1973, Haney & Stone 1988, Sagar & Sagar 1989).

Ringing results have shown that at least some Sandwich Terns breeding in West-Europe winter in Namibia (Vandewalle 1988; Noble-Rollin & Redfern 2002). Sandwich Terns in The Netherlands arrive at the breeding

Sandwich Terns and Common Terns with two Hartlaub's Gulls, Namibia 1999. Grote Sterns en Visdiefjes met twee Hartlaubsmeeuwen, Namibië 1999. *(Tom van der Have)*

colony from late March onwards, with peaks in arrival mid-April (experienced breeders) and mid-May (inexperienced breeders; Veen 1977; Brenninkmeijer & Stienen 1992). This would give birds leaving Namibia in early March 30-45 days to cover the distance to western Europe and arrive in April, flying on average 190-330 km day^{-1}. One Sandwich Tern, ringed as a chick on Griend, was captured in Namibia on 1 March 1999. Only six weeks later, on 18 April 1999, it was present in its natal colony. These data suggest that Sandwich Terns leaving Namibia in early March are indeed able to arrive in the Dutch colonies within six weeks travelling at 190-330 km day^{-1}.

Several Common Terns captured in Namibia during this study were ringed in Sweden, Finland and Estonia. To reach these areas around early May from southern Africa, terns departing in early March have to fly on average 160-280 km day^{-1}. This is considerably more than the 80-110 km day^{-1} calculated by Kasparek (1982).

Migration strategies of marsh terns *Chlidonias* spp. are even less well known than those of *Sterna* spp.. White-winged Black Terns are known to

appear inland in Africa on migration (Bates 1934; Begg 1973; Curry & Sayer 1979; Nikolaus 1987; Goudswaard & Wanink 1993), even over the Sahara (Moreau 1967; Dupuy 1969; Bundy 1971), while they appear to be virtually absent along the western coasts of Africa. White-winged Black Terns are common during spring migration in Sudan (Nikolaus 1987) and these birds may have followed the lake-scattered Rift Valley on their way north from southern Africa. It is not known where White-winged Black Terns are going to after they have left Namibia. The distance between Namibia and the mid-point of the breeding area is over 10,000 km. Most White-winged Black Terns in 1999 left prior to 1 March. To arrive in early May they have to migrate with an average speed of almost 170 km day^{-1}.

The general idea that terns breeding in Europe or Asia migrate in a steady pace along the coast, meanwhile feeding, is probably not true, certainly not for (all) those wintering in southern Africa and possibly not for the entire stretch. Our observations suggest a strategy of jump migration (Piersma, 1987) as is found in several wader species. This could be an indication that the number of suitable stop-over sites is restricted.

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VERTREKKENDE STERNS IN NAMIBIË IN HET VOORJAAR VAN 1999

Ten minste een deel van de in Noordwest-Europa broedende Visdieven *Sterna hirundo* en Grote Sterns *S. sandvicensis* overwintert in zuidelijk Afrika. Gedurende een onderzoek in Namibië zijn sterns gevangen en zijn tellingen en andere observaties aan sterns gedaan. Vooral in maart werden tijdens slaapplaatstellingen (figuur 1) wegtrekkende groepjes Grote Sterns, Witvleugelsterns Chlidonias leucopterus en Visdieven gezien. Van lokale sternsoorten (Reuzen- *S. caspia*, Damara- *S. balaenarum* en Kuifstern *S. bergii*) en de op het noordelijk halfrond broedende Zwarte Stern C. niger is deze wegtrek niet waargenomen. Mogelijke aankomst werd tweemaal waargenomen. Vanaf eind februari nam het aantal overnachtende sterns in het gebied sterk af en bleken ook de gemiddelde gewichten af te nemen. Dit laatste zou echter ook verband kunnen houden met een veranderde voedselsituatie. Vermoedelijk is genoemde periode de gebruikelijke wegtrekperiode van sterns uit dit gebied; de afname van gemiddelde gewichten zou dan verklaard kunnen worden doordat de zwaarste vogels wegtrekken. Na deze periode namen de gemiddelde gewichten weer toe.

Hoewel het om slechts een handvol waarnemingen gaat wordt duidelijk dat in ieder geval deze drie soorten sterns 's nachts trekken, een weinig bekend fenomeen, maar ook dat het daarmee aannemelijk wordt dat de vogels niet per se de kust volgen om op hun volgende rustplaats te komen. Het is bekend dat er zich aan de West-Afrikaanse kust 's winters en in het vroege voorjaar grote aantallen sterns ophouden. Ondanks de rui in de wintermaanden, die enkele maanden in beslag neemt, lijken ze nauwelijks in tijdnood te komen en hoeven ze zich blijkbaar niet te haasten om in het voorjaar weer tijdig op de kolonies aanwezig te zijn. De 'keuze' voor een sprongstrategie in plaats van

dagelijks een stukje vliegen en onderweg foerageren zou een aanwijzing kunnen zijn dat het aantal voedselrijke rustgebieden onderweg beperkt is.

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