

BREEDING GULLS AND TERNS IN SENEGAL IN 1998, AND PROPOSAL FOR NEW POPULATION ESTIMATES OF GULLS AND TERNS IN NORTH-WEST AFRICA

GUIDO O. KEIJL¹, ALLIX BRENNINKMEIJER², FRANS J. SCHEPERS¹,
ERIC W.M. STIENEN³, JAN VEEN⁴ & ABDOULAYE NDIAYE⁵

Keijl G.O., Brenninkmeijer, A., Schepers, F.J., Stienen, E.W.M., Veen, J. & Ndiaye A. 2001. Breeding gulls and terns in Senegal in 1998, and proposal for new population estimates of gulls and terns in north-west Africa. *Atlantic Seabirds* 3(2): 59-74. In *May 1998 breeding gulls and terns were surveyed in National Parks Langue de Barbarie and Sine-Saloum Delta, Senegal. This was the first near-complete census of breeding gulls and terns in this part of Senegal. The most numerous breeding species were Grey-headed Gulls *Larus cirrocephalus* (7565 pairs), Slender-billed Gulls *L. genei* (5550 p), Royal Terns *Sterna maxima* (22 693 p) and Caspian Terns *S. caspia* (>8620 p), while Common Terns *Sterna hirundo* (70 p) and Gull-billed Terns *Gelochelidon nilotica* (8 p) occurred in low numbers. The first four species were more numerous than expected from published accounts, the latter two occurred in smaller numbers than expected. Little Tern *Sterna albifrons* (35 p) and Kelp Gull *Larus dominicanus* (1 p) also bred in low numbers. The species are discussed, and a literature review of numbers breeding in the past is presented. Because Senegal, together with the Banc d'Arguin in Mauritania, are the most important areas for breeding gulls and terns in west Africa, and while recent counts are now available from both areas, new population estimates are given and new 1%-levels proposed. There are several threats to breeding birds, among which eggcollecting and overfishing, and the need for proper protection is outlined. Both the islands along the Senegalese coast and the Banc d'Arguin in Mauritania are of major importance for the west African subspecies of Royal Tern, of which almost the entire population breeds in Senegal and Mauretania. Mauritania is of great significance for the east Atlantic population of Bridled Tern *Sterna anaethetus*, a separate subspecies; this population may nowadays comprise as few as 100 pairs, but recent counts are not available.*

¹c/o WIWO, P.O. Box 925, 3700 AX, Zeist, The Netherlands, E-mail guido@hetnet.nl; ²Bureau Altenburg & Wymenga, Postbus 32, 9269 ZR Veenwouden, The Netherlands; ³Bureau voor Natuurbehoud, Kliniekstraat 25, 1070 Brussel, Belgium; ⁴Alterra, P.O. Box 23, 6700 AA, Wageningen, The Netherlands; ⁵Wetlands International, West Africa Office, P.O. Box 8060, Dakar-Yoff, Senegal.

INTRODUCTION

The north-west coast of Africa supports a prolific seabird community throughout the year. Especially important to seabirds are the shallow areas of the Banc d'Arguin in Mauritania, the Senegal River Delta, Ile de la Madeleine, the Delta of the Sine-Saloum, and the mangrove area in Guinea-Bissau (*e.g.* Cooper *et al.* 1984; Cramp & Simmons 1983; Cramp 1985; Burger & Gochfeld 1996; Gochfeld & Burger 1996). There are areas, such as the mouth of the Gambia river in Gambia, and the Casamance in the south of Senegal, that have not been censused yet, but it is likely that they too support seabird colonies. Even although much attention has been devoted to breeding seabirds in these areas in the past (for Senegal: de Naurois 1964; Latour 1973; Dupuy 1975; 1976; 1983; 1984; Erard 1975; Gowthorpe 1979; Delaporte 1991; for the Banc d'Arguin: Cooper *et al.* 1984; Gowthorpe *et al.* 1996), attention has usually focused on terns, especially Royal Terns *Sterna maxima*, while numbers of non-target species have been estimated, often by obscure methods.

Because of the importance of the Senegalese coast for breeding seabirds, and the lack of recent and detailed data, a census was carried out in May 1998. Colonies of gulls and terns were visited at the Langue de Barbarie and the Sine-Saloum Delta. In this paper we report on the results of the survey.

Since the most important areas for breeding gulls and terns in north-west Africa are located in Mauritania and Senegal (Cramp & Simmons 1983; Croxall *et al.* 1984; Cramp 1985; Nettleship *et al.* 1994; del Hoyo *et al.* 1996) we feel that, after the census in 1998, it is possible to give a reliable population estimate for most species breeding along the entire north-west African coast (Morocco to Liberia, including the Madeiran islands, Selvagen islands, Canary Islands and Cape-Verde Islands). We also propose new 1%-levels for the gulls and terns breeding in this area (*cf.* Rose & Scott 1997).

METHODS

In 1998 the following areas were visited: Ilot aux Oiseaux at Parc National Langue de Barbarie and Parc National Guembeul (17 May), and the salines at Kaolack (20 May), Ile aux Oiseaux (18-25 May, with an additional visit from 21-28 July), Ile de Sangomar (26 May), Ile Senghor (26 May) and the sandbanks north of Ile aux Oiseaux (26 May; Figure 1) at Parc National du Delta du Sine-Saloum. The survey was carried out in the second half of May because this appeared to be the main breeding period for Royal Terns (*e.g.* Delaporte 1991). Nests of gulls and terns (*i.e.* Grey-headed Gull *Larus cirrocephalus*, Slender-billed Gull *L. genei*, Kelp Gull *L. dominicanus*, Gull-billed Tern *Gelochelidon nilotica*, Caspian Tern *S. caspia*, Common Tern

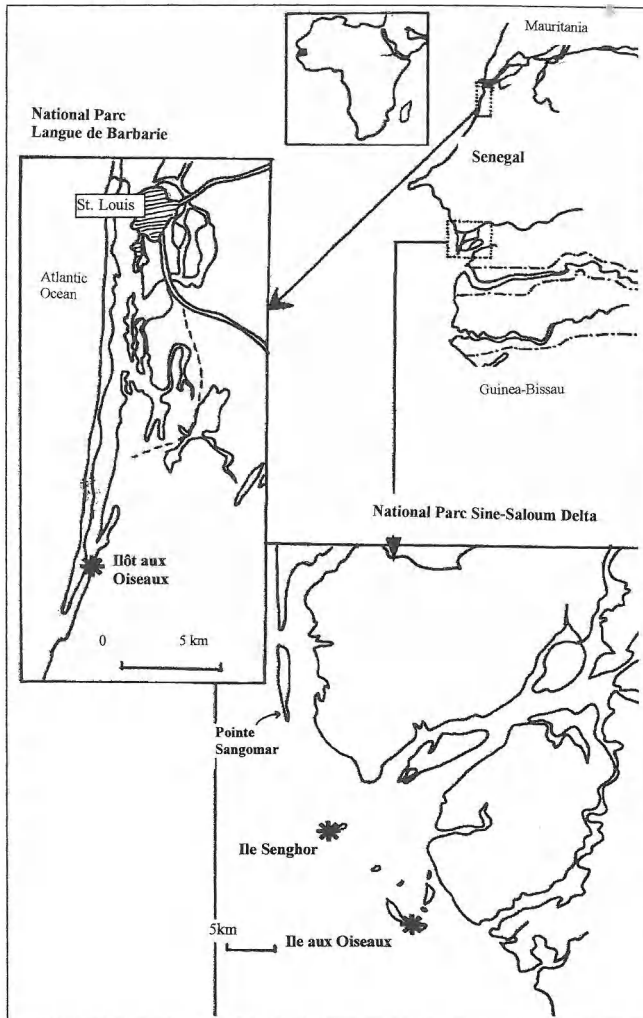


Figure 1. National Park Langue de Barbarie and National Parc Sine-Saloum Delta in west Africa. Sites with large colonies of gulls and terns in 1998 are indicated with asterisks.

Figuur 1. Ligging van Nationaal Park Langue de Barbarie en Nationaal Parc Sine-Saloum Delta in West-Afrika. De grote meeuwen- en sternkolonies in 1998 zijn met sterretjes aangegeven.

Table 1. Counted or estimated numbers of breeding gulls and terns at Langue de Barbarie (including National Park Guembeul) and Sine-Saloum Delta (Ile aux Oiseaux, Ile Senghor, salines at Kaolack) in Senegal in May 1998.

Tabel 1. Getelde of geschatte aantallen broedende meeuwen en sterns op Langue de Barbarie (inclusief Nationaal Park Guembeul) en Sine-Saloum Delta (Ile aux Oiseaux, Ile Senghor, zoutpannen Kaolack) in Senegal in mei 1998.

Species	Langue de Barbarie	Sine-Saloum	Total
Grey-headed Gull <i>Larus cirrocephalus</i>	3000	4565	7565
Slender-billed Gull <i>L. genei</i>	2100	3450	5550
Kelp Gull <i>L. dominicanus</i>	0	1	1
Total gulls	5100	8016	13 116
Gull-billed Tern <i>Gelochelidon nilotica</i>	0	8	8
Caspian Tern <i>Sterna caspia</i>	>10*	8610	>8620
Common Tern <i>S. hirundo</i>	0	70	70
Little Tern <i>S. albifrons</i>	35	0	35
Royal Tern <i>S. maxima</i>	1650	21 043	22 693
Total terns	>1695	29 731	>31 426

* 10 fledglings

S. hirundo and Royal Tern) were counted one by one. Gull nests of the previous year were easily recognisable as such and were not included. At Langue de Barbarie, however, Caspian Terns had almost completed their breeding cycle, and the majority of young birds had already fledged. Therefore an estimate of the breeding population was made on basis of the number of adult and young birds present, and by counting the empty nests in the colonies. Royal Terns were still breeding, but there were also pairs with large young. The colony of Grey-headed Gulls at Langue de Barbarie was partly counted, after which numbers were extrapolated. For details on counting methods on Ile aux Oiseaux, which differed according to species, see Keijl *et al.* (2000).

RESULTS AND LITERATURE REVIEW

A total of 16 waterbird species (including herons, egrets and ibises) was found breeding in coastal Senegal in 1998. Among these were three species of gull and five species of tern (Table 1). In 1998, the Langue de Barbarie supported at least 5100 pairs of gulls and at least 1700 pairs of terns. In the Sine-Saloum Delta (including the salines at Kaolack) 8016 pairs of gulls and 29 731 pairs of terns were counted, giving a grand total of 44 574 pairs. The majority comprised only four species: Grey-headed Gull, Slender-billed Gull, Caspian and Royal Tern.

Grey-headed Gull *Larus cirrocephalus* In 1998, 7565 nests were counted along the Senegalese coast. The species also breeds on the Banc d'Arguin, Mauritania, with 50 pairs in 1984; c. 25 pairs during 1984-1985 and 10-20 pairs in 1995 (Campredon 1987; Lamarche 1988; Gowthorpe *et al.* 1996). Apart from the colonies in Senegal, there are apparently no breeding sites holding large numbers along the entire south and west African coast (Cooper *et al.* 1984; Nettleship *et al.* 1994; Gatter 1997; Hafner *et al.* 1998; Brooke *et al.* 1999). Our results show that the population estimate for Grey-headed Gull in west Africa given by Cooper *et al.* (1984; Table 3) is much too low. Moreover, even though most of the Grey-headed Gulls breed from mid-May onwards, the species apparently has an extended breeding season, with pairs possibly starting as early as March, while others are still seen with small young as late as July (wardens of Ile aux Oiseaux pers. comm). We estimate that the north-west African population presently holds about 10 000 pairs, corresponding to a 1%-level of 300 individuals.

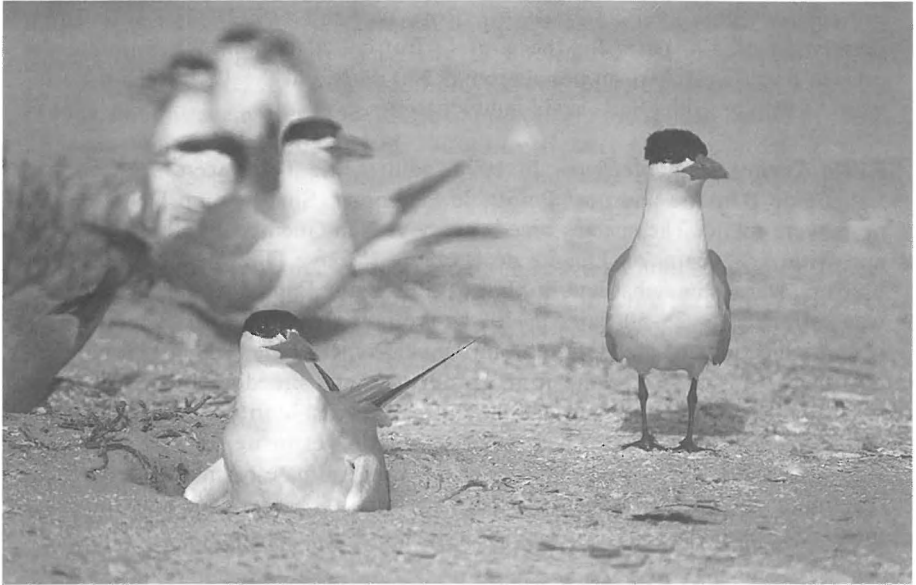
Slender-billed Gull *Larus genei* In 1998, 5550 nests were counted. Interestingly, Cooper *et al.* (1984) mentioned 2850 pairs in west Africa (Table 3; numbers based on Dupuy 1976; Trotignon *et al.* 1976 and Gowthorpe 1979), while in the same year Dupuy (1984) reported the species to be "on the increase" and estimated the population at the Langue de Barbarie, in the Sine-Saloum Delta, and at Kalissaye (S-Senegal) combined at 5000 pairs. In contrast to Grey-headed Gull, the entire population of Slender-billed Gulls appears to breed simultaneously in May-June. In 1998, 1776 were counted on the Banc d'Arguin (Hafner *et al.* 1999). The (derived) estimate of Rose & Scott (1997) is 3333 breeding pairs. The present estimate for the entire north-west African population is 7500 pairs, with a 1%-level of 225 individuals.

Kelp Gull *Larus dominicanus* During our visit (18-25 May) there were up to four (sub) adult Kelp Gulls present on Ile aux Oiseaux. A nest was found on 25 May, close to a Caspian Tern subcolony. It contained one chick of one day old, one recently hatched ('wet') chick and one egg (photo on p. 27 in Keijl *et al.* 2000). This is the third breeding record of this species in Senegal. The first nest was found between 26-30 June 1980 on Ile Téréma (a small island close to Ile aux Oiseaux) and probably belonged to a mixed pair of Kelp Gull and Lesser Black-backed Gull *L. [fuscus] graellsii* (Dupuy 1984). A second nest was found on Ile aux Oiseaux between 28-30 May 1983 (Erard *et al.* 1984). This pair of Kelp Gulls is probably the only one breeding in the northern hemisphere, and is the northernmost one in Africa (*cf.* Burger & Gochfeld 1996).

Gull-billed Tern *Gelochelidon nilotica* Only eight nests of Gull-billed Terns were found at the salines near Kaolack. It is possible that the number would have increased further in the course of the season, because some tens of adults present in the area could have been birds that had not started breeding yet (*cf.* Browne 1981; Hafner *et al.* 1999). On the other hand, it is also possible that Gull-billed Terns declined considerably since the early 1970s. Outside Senegal, Gull-billed Terns in North-Africa breed only in the Mediterranean, possibly a few pairs every year (Glutz von Blotzheim & Bauer 1982; Meininger *et al.* 1994), and in Mauritania; on the Banc d'Arguin 1600 pairs bred in 1978, on Aftout es Sahéli, Toumbos, an other 1850 pairs bred in September 1987; and 80 kilometres south of Nouakchott there were *c.* eight more pairs (Trotignon 1980 in Browne 1981; Lamarche 1988). More recently, numbers in Mauritania have apparently been lower; after a minimum of 250 pairs in 1994 on the Banc d'Arguin, 660 pairs were counted there in 1995; and in the same year there were 15 pairs near Nouakchott (Gowthorpe *et al.* 1996). In 1972 and 1973 Gull-billed Terns bred with 200 and 300 pairs respectively at the mouth of the Senegal river (Latour 1973), but we have no information on the present situation or on the intervening period. Hafner *et al.* (1999) did not mention Gull-billed Terns as a breeding species during their recent census on the Banc d'Arguin. The colony at Kaolack is the southernmost one in Africa (Cooper *et al.* 1984). Rose & Scott (1997) give 12,000 individuals for west-Europe and north-west Africa together, corresponding to 4000 breeding pairs. In west Europe there are presently about 2000 breeding pairs (Biber 1994; Gochfeld & Burger 1996); this leaves 2000 pairs for the entire African continent (*i.e.* north-west and north Africa). We estimate that the north-west African population presently holds 800 pairs, which corresponds to a 1%-level of 24 individuals.

Caspian Tern *Sterna caspia* Caspian Terns seem to have increased markedly during the past decade; in 1991 the number was estimated at 4700 pairs on Ile aux Oiseaux (Delaporte 1991), but in 1998 we counted 8600 pairs. On Langue de Barbarie, it was not possible to make even a rough estimate of the population, as the breeding season was already finished and only some large fledglings with adults were present. The colony numbered at least 10 pairs. Cooper *et al.* (1984) reported 2400 pairs for the entire north-west African coast, and Gochfeld & Burger (1996) estimated the population at 5000 pairs. Although the situation on the Banc d'Arguin is obscure, because breeding takes place continuously from February until June (Hafner *et al.* 1999; this is also the case in Senegal), the Mauritanian population numbers at least 4000 pairs. (Hafner *et al.* 1999 give a total of 10 903 breeding pairs, but this seems a summation of all numbers counted on eight occasions between 23 February and 8 June 1998.) South of Ile aux Oiseaux Caspian Terns bred in the past with about 1500 pairs in

Gambia and the Casamance, and 400-600 pairs in Guinea-Bissau (Britton 1986), although Brenninkmeijer *et al.* (1998) counted only 84 nests there in November 1992. Rose & Scott (1997) give a breeding population of 4000 pairs. We estimate the present north-west African population at 13 500 breeding pairs, and a 1%-level of 405 individuals.



Caspian Tern *Reuzenstern* (photo Frans Schepers).

Common Tern *Sterna hirundo* We estimated the population on Ile Senghor at 45 pairs and the one on Ile aux Oiseaux at 25 pairs. Numbers at Ile Senghor were difficult to estimate though, because the entire colony was plundered by fishermen immediately prior to our visit. The number of Common Terns at Ile aux Oiseaux was difficult to estimate as well, because the nests were scattered along the edge of the entire gull colony. Because of predation by gulls, the time spent near the Common Tern nests was kept to a minimum. The hundreds of pairs of Common Tern in the Sine-Saloum Delta, mentioned by de Naurois (1964), have probably largely disappeared. Erard (1975) counted 'some dozens' on Ile aux Oiseaux in June 1974; while Gowthorpe (1979) counted only eleven nests on the same island a few years later. Even though Dupuy (1984) noted that the species increased along the Senegalese coast, Delaporte (1991) found only 28 nests in the Sine-Saloum Delta. The only other location in Senegal where Common Terns are known to breed is the Casamance. Elsewhere along the

north-west African coast breeding sites are found on the Banc d'Arguin, Mauritania, with approximately 200 pairs in 1974 (Trotignon 1976), and (in unknown numbers) in Western Sahara, Guinea-Bissau, Nigeria and Libya (Britton 1986). On the Banc d'Arguin, however, the species was not encountered during the most recent censuses (Hafner *et al.* 1998; 1999, but note that these were conducted by aeroplane). There are no indications for breeding in Libya at present (*cf.* Meininger *et al.* 1994). Rose & Scott (1997) give a breeding population of 400 pairs for the entire Afrotropical region. We estimate the present north-west African population at 200 pairs and the 1%-level for north-west African breeding birds at six individuals.

Little Tern *Sterna albifrons* In 1998, adult Little Terns were seen only at Langue de Barbarie and near Pointe de Sangomar, Sine-Saloum Delta, but no nests were found. The species breeds every year in Guembeul with 35-50 pairs, and with *c.* 35 pairs on Langue de Barbarie (Mbaye Diop pers. comm.), but breeding starts somewhat later in the season. On the Banc d'Arguin, the number was estimated at 25-50 pairs in 1974 (Trotignon *et al.* 1976). There are no recent indications of breeding in Mauritania (Hafner *et al.* 1998; 1999, but note that these censuses are done from aeroplanes, and breeding Little Terns are notably difficult to count because they often breed solitarily, and pairs may be spread over a large area). There is no population estimate for this species in Rose & Scott (1997). We propose a population estimate for north-west Africa (excluding the Mediterranean) of 100 pairs and a 1%-level for individuals of three.

Royal Tern *Sterna maxima* In 1998 we counted almost 23 000 breeding pairs, of which over 21 000 on Ile aux Oiseaux. Together with Mauritania, where a maximum of 11 041 was counted in May-June 1998 (Hafner *et al.* 1998), at least 34 000 pairs were breeding in west Africa in 1998. (In June 1999, however, there were about 43 000 pairs on Ile aux Oiseaux - pers. obs.) Between 1960 and 1998, Royal Terns have been found breeding at the Banc d'Arguin, Mauritania, at the Langue de Barbarie, Pointe de Sangomar, Ile aux Oiseaux, and in the Casamance (all in Senegal), in Gambia, and in Guinea-Bissau, but apparently did not breed every year on every site. In Western Sahara the species did not breed in the 1950s (Valverde 1957), but there is no information before and after this period. In 1974; Erard (1975) saw three displaying pairs on Ile aux Oiseaux, while in the same year Dupuy (1975) found 10 000 chicks on the south point of Pointe de Sangomar, Sine-Saloum Delta. In Gambia and the Casamance (south Senegal) the species bred in the early 1960s (Morel & Roux 1966), but we have no information from these areas from recent years. De Naurois (1964) and Morel & Roux (1966) named several of the above mentioned locations of

breeding in west Africa, but not the Sine-Saloum Delta, so either this site was not visited by them in the 1960s or, more likely, the species was not breeding there. The Royal Terns regularly shift between breeding sites, resulting in seemingly large fluctuations at any site; in Mauritania for instance, the population fluctuated between 3000 and 16 911 pairs during 1984-1998 (Hafner *et al.* 1999; although this may have been due also to variation in counting dates between years, coverage of the area, or differences in census methods). The reason for shifting of breeding site is unclear. The north-west African population was recently estimated at only 25 000 pairs by Gochfeld & Burger (1996), but this seems very low, as Delaporte (1991) found many more in 1991: 2650 on Langu de Barbarie and 27 500 on Ile aux Oiseaux. Rose & Scott (1997) gave a population estimate of 16 667 pairs. We estimate the population at 43 000 pairs, with a 1%-level of 1290 individuals.

Other gull and tern species Apart from the above mentioned species, Black-headed Gull *L. ridibundus*, Laughing Gull *L. atricilla*, Franklin's Gull *L. pipixcan*, Sooty Tern *S. fuscata* and Bridled Tern *S. anaethetus* have (possibly) bred on the Senegalese coast, but were not found breeding in 1998. The breeding of the three gull species is highly erratic (Dupuy 1983; Erard 1984; Mbaye Diop pers. comm.).

A nest of a Sooty Tern was found on 9 July 1954 on Ile Diamanio, Sine-Saloum Delta (de Naurois 1969). Two nests were found between 1977 and 1980 on Langu de Barbarie, and one in May-June 1979 in the Sine-Saloum Delta, after which the species returned for a few more years (Dupuy 1979). On 22 May 1998 one adult was observed on Ile aux Oiseaux, and in July 1998 two were seen on the same site, but there were no indications of breeding.

Until 1999, Bridled Terns unsuccessfully attempted to breed in Senegal (Erard 1975; Britton 1986). The species bred in Mauritania, with 1200-1800 pairs between 1959 and 1965 and only 100 pairs in 1995 (de Naurois 1969; Gowthorpe *et al.* 1996).

DISCUSSION

Senegal is very important for breeding seabirds in west Africa, especially for Grey-headed Gull, Slender-billed Gull, Royal Tern and Caspian Tern, and the 1%-levels given by Rose & Scott (1997) are greatly exceeded for these species at present (Table 2). For several species however there are no population estimates available. With at least 37 000 pairs of gulls and terns, Ile aux Oiseaux hosts the largest seabird colony along the Senegalese coast. Although it is tempting to compare numbers with those found in the past (de Naurois 1964; Latour 1973; Dupuy 1975; 1976; Erard 1975; Gowthorpe 1979; Delaporte

Table 2. 1%-levels for gulls and terns breeding in north-west Africa (Rose & Scott 1997; first column) and the time this number was exceeded in Senegal in 1998 (second column). Also, a proposal for new 1%-levels for breeding populations in north-west Africa is presented. Gulls and terns that have never been found breeding in Senegal, but do breed in north-west Africa (Yellow-legged Gulls *Larus m. michahellis*, *L. m. atlantis*, Roseate Terns *Sterna dougallii*; Zino & Bischoit 1994) are not included. - = no population estimate available, + = present, but comparison not possible.

Tabel 2. 1%-normen voor in Noordwest-Afrika broedende meeuwen en sterns (Rose & Scott 1997; eerste kolom) en het aantal keer dat dit getal werd overtroffen in Senegal in 1998 (tweede kolom). Een voorstel voor een nieuwe 1%-norm staat in de laatste kolom. Meeuwen en sterns die nog nooit in Senegal hebben gebroed, maar dit wel elders in Noordwest-Afrika doen (beide Geelpootmeeuwen *Larus m. michahellis* en *L. m. atlantis* en Dougalls Stern *Sterna dougallii*; Zino & Bischoit 1994) worden hier niet behandeld. - = geen populatieschatting bekend, + = aanwezig, maar vergelijking niet mogelijk.

	1% Rose & Scott 1997	number x 1% in Senegal 1998	1% breeding population NW Africa
Grey-headed Gull <i>L. cirrocephalus</i>	-	+	100
Slender-billed Gull <i>L. genei</i>	33	167	75
Kelp Gull <i>L. dominicanus</i>	-	+	1
Gull-billed Tern <i>G. nilotica</i>	20	0.4	8
Caspian Tern <i>Sterna caspia</i>	40	216	135
Common Tern <i>S. hirundo</i>	4	17.5	2
Little Tern <i>S. albifrons</i>	-	+	1
Royal Tern <i>S. maxima</i>	167	128	400
Bridled Tern <i>S. anaethetus</i>	45	-	1
Sooty Tern <i>S. fuscata</i>	400	-	2

1991), this is not done because of differences in survey methodology. Also, there is no information about movement of breeding birds between the various locations along the west African coast; rendering a comparison even more difficult.

Threats and protection Cooper *et al.* (1984) concluded that most seabird populations in west Africa have increased since the 1960s. Since their publication, numbers appear to have increased further, although there are large differences, both between locations and between species. One explanation for numerical increase could be the marked growth in commercial fishery and the resulting change in the fish community (*cf.* Furness 1984). There have been many studies emphasizing the close relationship between fish populations,

Table 3 Comparison of several estimates in the literature of breeding pairs of gulls and terns along the north-west African coast, that breed in Senegal, or have bred there in the past. The numbers given by Cooper *et al.* (1984, first column) are based on census results dating from 1972-1975. Gulls and terns that have been recorded breeding in north-west Africa but not in Senegal (Yellow-legged Gulls *Larus m. michahellis*, *L. m. atlantis*, Roseate Terns *Sterna dougallii*; Zino & Biscoito 1994) are not considered here. + = present but not counted; - = absent.

Tabel 3. Vergelijking van het aantal in Noordwest-Afrika en Senegal broedende paren meeuwen en sterns tussen verschillende literatuurbronnen. De aantallen die door Cooper *et al.* (1984, eerste kolom) worden gegeven zijn afkomstig uit de jaren 1972-1975. Meeuwen en sterns die nog nooit in Senegal hebben gebroed, maar dit wel elders in Noordwest-Afrika doen (beide Geelpootmeeuwen *Larus m. michahellis* en *L. m. atlantis* en Dougalls Stern *Sterna dougallii*; Zino & Biscoito 1994) worden hier niet behandeld. + = aanwezig maar niet geteld, - afwezig.

Species	Cooper <i>et al.</i> 1984	Urban <i>et al.</i> 1986	del Hoyo <i>et al.</i> 1996
Grey-headed Gull <i>L. cirrocephalus</i>	600-700	-	+
Slender-billed Gull <i>L. genei</i>	2850	3000	6000-7000
Kelp Gull <i>L. dominicanus</i>	-	1	-
Gull-billed Tern <i>G. nilotica</i>	1800	1700-2100	2000
Caspian Tern <i>S. caspia</i>	2400	3500-4300+	5000
Common Tern <i>S. hirundo</i>	400	200-900+	+
Little Tern <i>S. albifrons</i>	150	100s	few 100s
Royal Tern <i>S. maxima</i>	10 500	15 000-21 000	25 000
Bridled Tern <i>S. anaethetus</i>	1500	1700+	+
Sooty Tern <i>S. fuscata</i>	2	-	+

seabird populations and commercial fisheries (e.g. Ashmole 1963; Crawford & Shelton 1981; Furness & Cooper 1982; Safina & Burger 1985; Hunt *et al.* 1986; Schaffner 1986; Cairns 1988; Heubeck 1989; Monaghan *et al.* 1992a, b, Clapp *et al.* 1993; Nettleship *et al.* 1994). If we consider all fish-eating bird populations in west Africa (such as cormorants *Phalacrocorax* spp., Red-billed Tropicbird *Phaeton aethereus*, pelicans *Pelecanus* spp., herons and egrets *Ardeidae*, storks *Ciconiidae*, African Fish-eagle *Haliaeetus vocifer* and kingfishers *Alcedinidae*) there are no indications for increases on the Banc d'Arguin. On the contrary, the numbers of cormorants, herons, egrets, gulls and terns have decreased in the mid-1990s after an increase in the 1980s (Gowthorpe *et al.* 1996; Hafner *et al.* 1999). On Ile de la Madeleine, Senegal, the numbers of Great Cormorants *Phalacrocorax carbo lucidus*, however, have increased greatly (Schepers *et al.* 1998). For the other species or species groups

there are no data, either for the Sine-Saloum Delta, for the remainder of Senegal or elsewhere in west Africa.

Other important, more direct threats to seabird colonies in Senegal are tourism, habitat destruction, collecting of eggs, hunting of birds, and (introduction of) ground predators (*e.g.* Stienen *et al.* 1998). Men have collected seabird eggs for hundreds of years (*e.g.* Dragesco 1961). Presently however, at least some of the colonies are over-exploited by egg-collectors. The birds are restricted in their choice of breeding locations, while the human population has increased and continues to do so. In addition transportation has improved, making it possible for people to easily visit every seabird colony.

The north-west African countries have high responsibility for the conservation of several species mentioned in Table 2, especially Royal Tern and Bridled Tern. The African Royal Terns are separated from the North American population as a different subspecies *S. m. albididorsalis*. This means that the world population of this subspecies occurs only in north-west Africa.

The west African Bridled Terns seem to be completely isolated from the other Atlantic populations, and they are sometimes considered to belong to a separate subspecies *S. a. melanoptera*. In the east Atlantic, there is a small population in Mauritania, while other colonies are found only on Ile Virginie, Western Sahara, where 400 pairs were counted in 1960 (Heim de Balsac & Mayaud 1962), and on Pagalu (or Annobon) in the Gulf of Guinea with 200 pairs (Fry 1961; Britton 1986). Rose & Scott (1997) estimated the west African breeding population at 1500 pairs, but this seems too high. It is not known whether Bridled Terns still breed in Western Sahara, while they seem to have disappeared from the Gulf of Guinea (*cf.* Williams 1984; Gochfeld & Burger 1996). The west African Bridled Terns are therefore amongst the most threatened seabirds in the world.

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**BROEDENDE MEEUWEN EN STERNS IN SENEGAL IN 1998, EN
VOORSTEL VOOR NIEUWE POPULATIESCHATTINGEN VAN MEEUWEN
EN STERNS IN NOORDWEST-AFRIKA**

*In 1998 zijn broedende meeuwen en sterns geteld langs de Senegalese kust. Het was de eerste volledige telling van alle soorten meeuwen en sterns in Senegal; in het verleden concentreerden onderzoekers zich meestal vrijwel geheel op Koningssterns *Sterna maxima*, of op enkele soorten sterns, en werden in het gunstigste geval schattingen gegeven van andere soorten. Er zijn twee belangrijke gebieden met grote kolonies, namelijk Nationaal Park Langue de Barbarie, in het noorden van het land, en Nationaal Park Sine-Saloum Delta, juist ten noorden van Gambia. In totaal werden 13.116 paar meeuwen en (ten minste) 31.426 paar sterns geteld (tabel 1). De belangrijkste soorten waren Dunbekmeeuw *Larus genei*, Grijskopmeeuw *L. cirrocephalus*, Reuzenster *S. caspia* en Koningsstern. Kelpmeeuw *L. dominicanus*, Lachstern *Gelochelidon nilotica*, Visdief *S. hirundo* en Dwergstern *S. albifrons* broedden in lage aantallen.*

Hoewel het verleidelijk is om de in 1998 getelde aantallen te vergelijken met die van eerdere tellingen, wordt een directe vergelijking niet gemaakt omdat van eerdere tellingen vaak onduidelijk is hoe de aantallen tot stand zijn gekomen. Wel worden de oude populatieschattingen gegeven. Tevens wordt een voorstel gedaan voor nieuwe schattingen en voor nieuwe 1%-normen (tabel 2). Dit is mogelijk omdat van alle genoemde soorten vrijwel de gehele West-Afrikaanse populatie uitsluitend in Senegal en op de Banc d'Arguin in Mauretanië broedt.

Grijskopmeeuw was met ruim 7500 paar de talrijkste meeuw. De vorige West-Afrikaanse populatieschatting was 600-700 paar (tabel 3). In Mauretanië broeden enkele tientallen paren, ook elders langs de gehele West-Afrikaanse kust komen geen grote kolonies voor. Tot nog toe waren geen tellingen uit West-Afrika beschikbaar. De nieuwe schatting bedraagt 10.000 paar. Van Dunbekmeeuw werden 5550 paar geteld. In Mauretanië werden recent bijna 2000 paar geteld. De oude populatieschatting voor West-Afrika bedroeg 3300 paar, voorstel voor een nieuwe schatting is 7500 paar. Van Kelpmeeuw werd een nest gevonden met twee jongen en een uitkomend ei. Dit is het derde broedgeval van deze soort in Senegal en vermoedelijk het enige op het noordelijk halfrond. Van Lachstern werden slechts acht paar gevonden in zoutpannen bij Kaolack. Mogelijk vestigden zich later in het seizoen nog nieuwe paren. De grootste aantallen broeden in Mauretanië; recent werden daar bijna 700 paar geteld. In het verleden werden in het noorden van Senegal 200-300 paar geteld, maar hier is geen recente informatie over. De oude populatieschatting bedroeg 2000 paar, de nieuwe 800. Van Reuzenster vonden wij in 1998 ten minste 8600 paar, vrijwel alle op Ile aux Oiseaux. In de Langue de Barbarie was het broedseizoen al voorbij en werden slechts enkele vliegvlugge jongen gezien. Op de Banc d'Arguin broedde recent ten minste 4000 paar, terwijl ten zuiden van het in 1998 bezochte gebied recent ruim 2000 paar zijn geteld. De populatieschatting van 4000 paar voor Noordwest-Afrika is daarom naar 13.500 paar. Van Visdief werden 70 paar geteld, maar een exacte telling was moeilijk, omdat in een kolonie juist voor ons bezoek alle eieren door vissers geraapt waren. In een andere kolonie zaten de Visdieven verspreid langs de rand van de meeuwenkolonie. Om predatie van meeuwen tot een minimum te beperken werd daarom een snelle, globale telling gehouden. In Mauretanië broedden in de jaren 70 nog 200 paar, maar uit de jaren daarna zijn ons geen aantallen bekend. Voorheen werd de totale West-Afrikaanse populatie geschat op 400 paar. Onze schatting bedraagt 200 paar. Van Dwergstern werden geen broedende vogels aangetroffen, maar bewakers in Nationaal Park Langue de Barbarie meldden dat daar jaarlijks 35 paar broeden, zij het iets later in het seizoen. In het naburige park Guembeul broeden jaarlijks 35-50 paar. In Mauretanië broedden in de jaren 70 25-50 paar, maar uit later jaren zijn ons geen getallen bekend. De soort is notoir moeilijk te tellen, omdat zich vaak solitaire paren in afgelegen gebieden vestigen. Wij schatten de Noordwest-Afrikaanse populatie voorzichtig op 100 paar. Van Koningsstern telden wij bijna 23.000 paar, waarvan meer dan 21.000 in een kolonie op Ile aux Oiseaux. Tellingen van de Banc d'Arguin wijzen uit dat de aantallen jaarlijks enorm kunnen

fluctueren. De oude schatting voor West-Afrika bedroeg 17.000 paar. Wij schatten de huidige populatie op 43.000 paar.

Behalve bovengenoemde soorten zijn in het verleden mogelijke of zekere broedgevallen vastgesteld van Kokmeeuw *L. ridibundus*, Lachmeeuw *L. atricilla*, Franklin's Meeuw *L. pipixcan*, Bonte Stern *S. fuscata* en Brilstern *S. anaethetus*. Deze laatste soort broedde in het verleden in Spaanse Sahara en op Annobon in de Golf van Guinée. Na de jaren 1960 is geen informatie over de eerste broedlocatie, maar de broedvogels op de tweede zijn mogelijk verdwenen. De populatie in Mauretanië is derhalve de laatste in het Oost-Atlantische gebied. De oude schatting voor de populatie bedroeg 1500 paar, maar een recente schatting kwam niet verder dan 100 paar.

Het lijkt alsof de aantallen meeuwen en sterns in West-Afrika zijn toegenomen. Een mogelijke verklaring hiervoor zou de sterk toegenomen visserij kunnen zijn. Op de Banc d'Arguin lijken de aantallen echter eerder af- dan toegenomen te zijn. Van Senegal weten we alleen zeker dat de Aalscholvers *Phalacrocorax carbo lucidus* op Ile de la Madeleine zijn toegenomen; van alle overige viseters (aalscholvers, Roodsnavelkeerkringvogel *Phaethon aethereus*, pelikanen, reigers, ooievaars, Afrikaanse Visarend *Haliaeetus vocifer* en ijsvogels) zijn geen populatietrends bekend. Een reeks van andere bedreigingen wordt genoemd, waaronder eierrapers, invoer van grondpredatoren, biotoopvernietiging en jacht. Zowel Mauretanië als Senegal hebben een belangrijke verantwoordelijkheid voor de bescherming van deze vogels en hun biotopen.

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