Wader count of the Baie d'Arguin, Mauritania, in February 1997

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A count of waders and other waterbirds was undertaken in the Baie d'Arguin (an isolated bay in the northern part of the National Park du Banc d'Arguin, Mauritania; Figure 1) in February 1997. In total 85,000 birds were recorded, of which 79,000 were waders. These were similar results to the only other count of the area made in December 1978 (Table 1, Figure 2). Also the species composition reflected that of the main area of the Banc d'Arguin, where upwards two million waders spend the winter (Figure 3).

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INTRODUCTION

The National Park 'Banc d'Arguin' (Mauritania) is by far the most important wintering area for waders along the East-Atlantic Flyway. Nearly all these birds are concentrated in the southern part of the National Park, between Cap Tafarit and Cap Timiris where extensive intertidal flats are found along the mainland coast and around several islands. Another complex of tidal flats is situated 50 km north of Cape Tafarit in a bay, called Baie d'Arguin. Wolff & Smit (1990) used satellite images to estimate the surface of these tidal flats. They arrived for the southern area, the Banc d'Arguin proper, at a surface area of 427 km² tidal flats and for the Baie d'Arguin at 66 km².

Waders on the Banc d'Arguin have been counted during four winters (Knight & Dick 1975, Trotignon *et al.* 1980, Engelmoer *et al.* 1984, Gowthorpe et al. 1996), but there is only one winter count of the Baie d'Arguin, undertaken in December 1978 by Trotignon *et al.* (1980). These counts show that about two million waders winter on the Banc d'Arguin, compared with only 89,000 in the Baie d'Arguin. This implies that the wader density is only 13 waders per ha of intertidal flat in the Baie d'Arguin against 47 waders per ha on the Banc d'Arguin. However, since this comparison is based on only one single count for the Baie, more counts of the waders wintering in the Baie d'Arguin would be worthwhile, even, as this paper shows, the density estimate of 13 waders per ha in the Baie d'Arguin is too low since the surface estimate was incorrect.

SITE DESCRIPTION

The Baie d'Arguin is a bay 20 - 25 km wide and 35 km long, surrounded by Sahara dunes, including beautiful sickle-shaped examples, beaches and sebkhas. Sebkhas are usually of no importance for feeding waders since these salt-crusted sand flats are only flooded during the extremely high spring tides in late winter and late summer. Three large islands are situated in the middle of the bay; see Figure 1. The two smaller islands are uninhabited, but there is a small fishing village, called Agadir, on the SE side of the largest island, Île d'Arguin. Most tidal flats are situated north of Île d'Arguin, west of Île Ardent and south of Île Marguerites. At high tide most waders are concentrated on the north side of Île d'Arguin and on south side of the other islands. Île Marguerites and Île Ardent contain colonies of cormorants, herons and terns. However, most notable are the large numbers of Caspian Terns and, in some years, Flamingos that breed on a small isle west of Île Ardent, called Îlot des Flamants (Campredon 1987).

Wolff & Smit (1990) estimated the surface of the tidal flats and sebkha at 66 and 16 km², respectively. However, after digitising their map, we arrived at a somewhat higher total surface (91 km²), but less tidal flats (33.4 km²) and much more sebkha (57.5 km²). We assume that something must have gone wrong in their surface estimates because, as their own map shows (here reproduced as Figure 1), the surface area of the sebkha is indeed larger, and similar in proportion to the total surface of tidal flats. By using the new estimate of the surface of the tidal flats, the density of the waders during the winter of 1980 would rise from 13 to 26 waders per ha. For the interpretation of the counting results, we measured separately the surface of the tidal flats around the islands (23.4 km²) and along the 80 km coastline of the mainland (10 km²).

COUNT

We arrived by boat on Île d'Arguin on 13 February 1997 and,

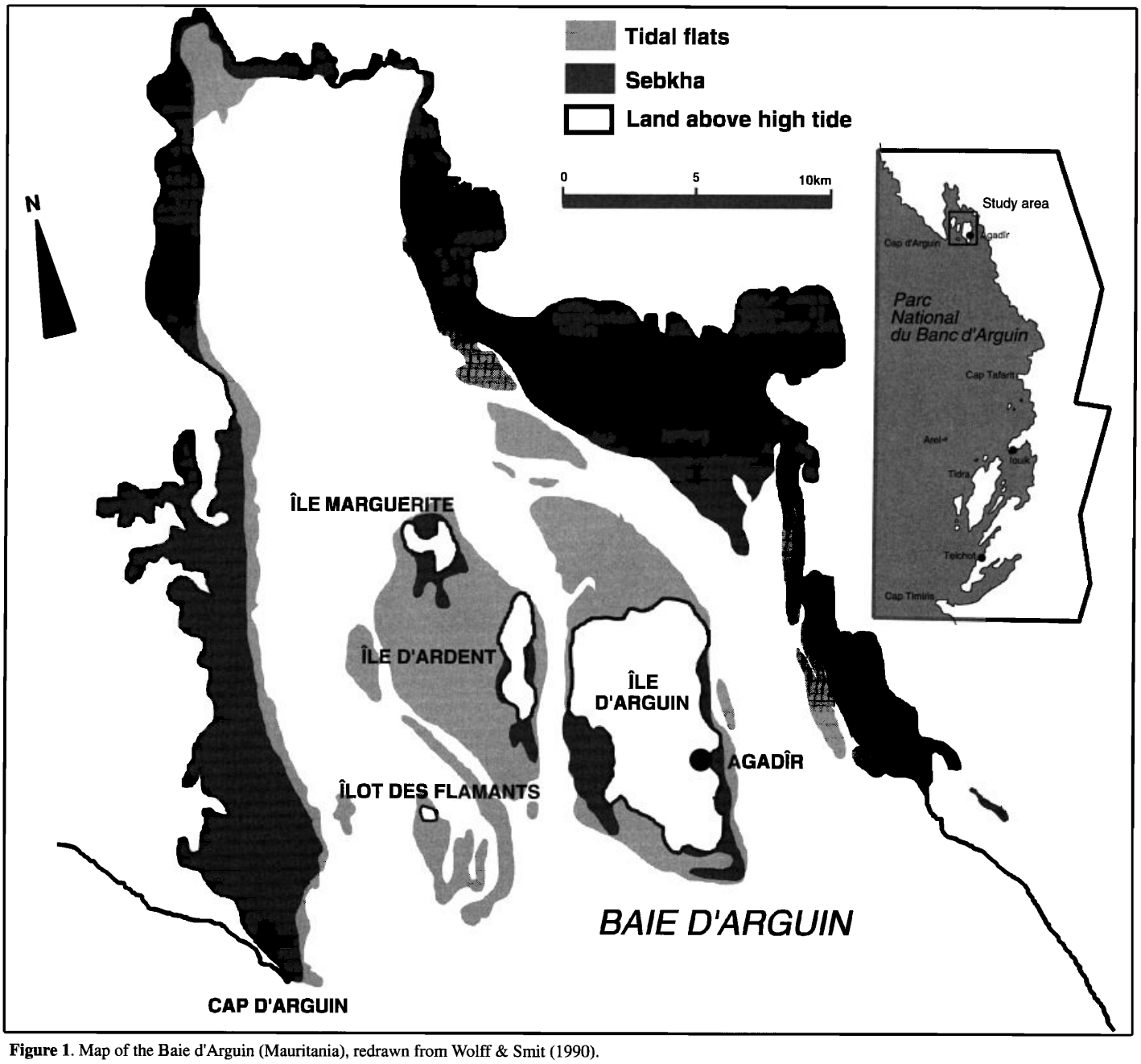

Figure 1. Map of the Baie d'Arguin (Mauritania), redrawn from Wolff & Smit (1990).

as conditions were right, immediately did a first count, just before sunset, of the waders roosting at the northern side of the island. The counting circumstances during the short time we could spend in the area were not ideal because it was high tide around sunrise and sunset. Coupled with this was the fact that the high tide level was close to neap tide and was therefore rather low. We decided to count the three islands the next day in four groups. Two groups walking around Île d'Arguin had an easy job and did a very accurate count of the roosting birds, although a large roost on a sand bank just NE of Île d'Arguin had to be counted from a distance. A comparison between the count of this roost with a count made hours before, during incoming tide, and also with the high water count of the day before, showed such a good agreement, that the numbers estimated for this roost must have also been accurate. The two other groups went by sailing boat and canoe to Île Marguerite and Île Ardent. One group walked around Île Marguerite at high tide and did a complete count, but the canoe of the other group capsized on the way to the isle. The two counters fortunately survived this adventure, but they lost their tripods and telescopes and could not count Île Ardent. The group on Île Marguerite tried to estimate from a large distance the birds present on Île Ardent and Îlot des Flamants. Very early the next morning, another counting group went out again, but since Îlot des Flamants and Île Ardent could only be reached just after high tide, the first waders had already started to spread out over the emerging tidal flats. Hence it was decided to count all birds from the boat while slowly drifting in the creek beside the flocks of birds. Although we had a beautiful view of the roosting and feeding birds, the numbers could not be counted (very) accurately.

We did not attempt to count the birds roosting along the mainland coast. We expected most birds to roost on the islands, because the map (Figure 1) showed a narrow strip of

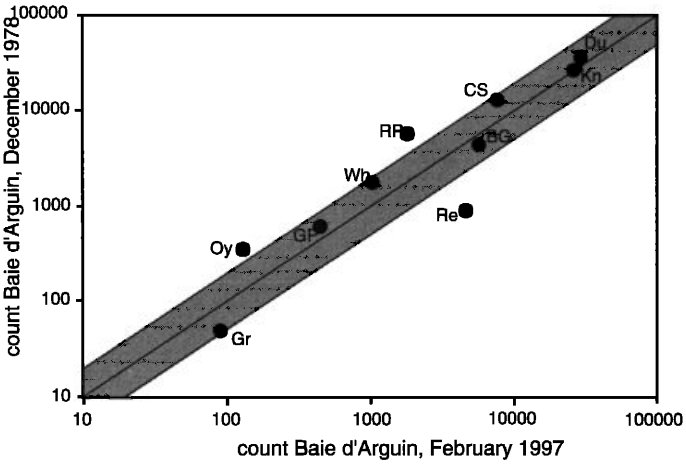

Figure 2. The number of waders counted in the Baie d'Arguin by Trotignon *et al.* (1980) in December 1978 plotted against the numbers counted by us in February 1997. Note that log-scales were used. The abbreviations of the wader species are given in Table 1. The grey bar indicates the area between y=2x and y=0.5x.

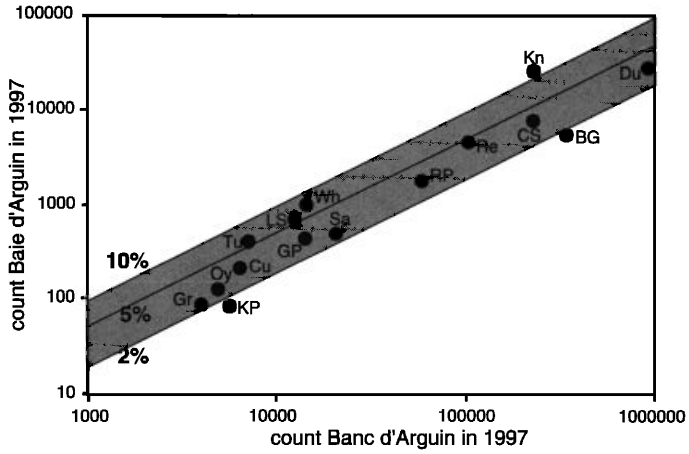

Figure 3. The number of waders counted on the Banc d'Arguin plotted against the numbers counted on the Baie d'Arguin in the same period (January-February 1997; Zwarts et al. 1998). Note that log-scales were used. The abbreviations of the wader species are given in Table 1. The lines give the expected number in the Baie d'Arguin at 2, 5 and 10% relative to the number on the Banc d'Arguin.

tidal flats along the coast line. Moreover, the sebkha was not accessible by car and there was no time to walk the 80 km around the Bay.

RESULTS

Table 1 shows the counted numbers on the four islands. In total we arrived at 86,000 birds of which 79,000 were waders, somewhat less than the numbers counted by Trotignon *et al.* (1980) 18 years before in December 1978. Also the numbers of the different wader species counted were comparable. The numbers for the three most common species (Dunlin, Knot and Curlew Sandpiper) were remarkably similar, as shown in Figure 2 where the numbers of both counts have been plotted on a log-log scale. Fewer Oystercatchers were counted in 1997. Trotignon *et al.* (1980) did not give the numbers of some less common wader species, such as Kentish Plover and Sanderling. It is possible they were then not counted.

DISCUSSION

Table 1 and Figure 2 clearly show that the new count arrived, at least for the most common species, at the same numbers as the previous count by Trotignon *et al.* (1980). We counted, however, far fewer Oystercatchers. A similar difference was found on the Banc d'Arguin (Zwarts *et al.* 1998). On the Banc d'Arguin, this decrease in numbers of Oystercatcher has been attributed to the gradual but large, long-term decline of its main food resource, the Bloody Giant Cockle *Anadara senilis*. This is probably also true for the Baie d'Arguin.

One may doubt, however, whether the two winter counts are fully comparable. We only counted the isles and not the mainland coast, whereas Trotignon *et al.* (1980) counted the entire bay, including the mainland coast. We saw from the boat that during incoming tides waders flew from the mainland coast east of Île d'Arguin to the island to roost there. Were that the case for all waders feeding on tidal flats adjacent to the mainland coast, then it would be irrelevant whether the mainland coast was included in the counted area or not.

However, this is something that still needs to be checked. The maximum number of birds missed, can already be roughly assessed. Assuming that the 79,000 waders counted at high tide on the isles only foraged at low tide on the tidal flats around the islands (2340 ha), their feeding density would be 33.8 birds per ha. If the density was the same on the 1000 ha adjacent to the mainland coast, 34,000 waders would have foraged there. There are two reasons why we must have missed (much) less than 34,000 waders. Firstly, as already mentioned, we saw waders flying from these mainland feeding areas to the isles. Hence at least a part of the mainland birds are included in our count. Secondly, the feeding density of waders on the tidal flats along the mainland coast was probably lower than around the isles, since a high proportion of the flats along the mainland coast is rather sandy and situated in the upper parts of the intertidal zone - a habitat which on the Banc d'Arguin attracts less waders (Zwarts *et al.* 1990). In conclusion, the wintering numbers of waders in the entire Baie d'Arguin may be estimated at 79,000 - <113,000 birds.

The first impression of the tidal flats in the Baie d'Arguin was that they did not differ from the tidal flats on the Banc d'Arguin, being a mixture of sand and mudflats mostly covered by seagrass. The counts show that also the wader composition is the same (Figure 3), although the overall wader density in the Baie d'Arguin is apparently lower than on the Banc d'Arguin as a whole. If the wader density on the tidal flats in the Baie d'Arguin was, as on the Banc d'Arguin, 47 birds ha^{-1}, the total number of waders wintering in the Baie d'Arguin would be 157,000 waders, 1.4 - 2 times as much as the number of waders counted by Trotignon *et al.* (1980) and by us. When a new count is done of the waders in the Baie d'Arguin, it will be necessary to spend more time counting the islands more precisely and checking whether waders roost along the mainland coast.

Table 1. Number of water birds counted at high tide on the four isles in the Baie d'Arguin on 14-16 February 1997. Also the total number counted by Trotignon *et al.* (1980) is given, as well as the abbreviations used in Figs. 2 & 3.

Bird species	Arguin	Ardent	Flamant	Marguerite	TOTAL	TOTAL 1978
Oystercatcher (Oy)	30	5	0	94	129	350
Ringed Plover (RP)	1517	0	0	288	1805	5700
Kentish Plover (KP)	84	0	0	1	85	
Grey Plover (GP)	302	10	120	25	457	620
Knot (Kn)	14095	4240	4000	4300	26635	27300
Sanderling (Sa)	417	0	0	67	484	
Little Stint (LS)	700	0	0	0	700	
Curlew Sandpiper (CS)	2079	600	0	5091	7770	13000
Dunlin (Du)	14001	2500	0	12435	28936	35200
Bar-tailed Godwit (BG)	2409	500	600	2247	5756	4400
Whimbrel (Wh)	512	236	20	280	1048	1800
Curlew (Cu)	34	100	60	19	213	
Redshank (Re)	231	1200	100	3234	4765	900
Greenshank (Gr)	21	0	0	67	88	50
Turnstone (Tu)	339	5	0	64	408	
Cormorant	64	55	0	5	124	70
White Pelican	10	25	20	8	63	30
Western Reef Heron	1	9	0	28	38	12
W.R. Heron/Little Egret	6	14	0	37	57	52
Grey Heron	9	8	0	16	33	39
Spoonbill	8	0	160	65	233	50
Greater Flamingo	69	0	320	363	752	130
Black-headed Gull	4	0	0	0	4	10
Grey-headed Gull	6	0	0	0	6	
Slender-billed Gull	169	0	1	3	173	10
Lesser Black-backed	129	6	2278	10	2423	3500
Gull-billed Tern	3	0	0	0	3	
Caspian Tern	56	400	1200	686	2342	300
Sandwich Tern	12	0	0	0	12	6000
Little Tern	1	0	0	0	1	5
Royal Tern	26	0	0	0	26	220
WADERS-total	**36771**	**9396**	**4900**	**28212**	**79279**	**89320**
ALL WATERBIRDS	**37344**	**9913**	**8879**	**29433**	**85569**	**99748**

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