AUTUMN WADER MIGRATION IN BAHRAIN
by Graham Tucker

The recent paper by Smart *et al* (1983) on the waders and waterbirds of Dubai Creek outlined the year-round use of a tidal creek on the southern shore of the Arabian Gulf. They concluded that the peak numbers of shorebirds using the area indicates that the Arabian Gulf may constitute an important staging post for waders migrating between Asia and Africa, and so warrants further investigation. This has prompted me to write this note summarising my observations of waders in another part of the Arabian Gulf, Bahrain, during the peak of autumn migration in September. Although the counts cannot give a measure of the total population size of waders present on Bahrain at any one time, they do indicate the relative proportions of the species involved.

The island of Bahrain is situated approximately mid-way between the head of the Arabian Gulf and the Straits of Hormuz, and lies ten miles off the coast of Saudi Arabia (Figure 1a). It is some 47 km long and 13 km at its widest. The coast is largely surrounded by extensive tidal areas of barren Sabkha - waterlogged sand, often of very high salinity. These areas are most extensive in the south and have been little studied.

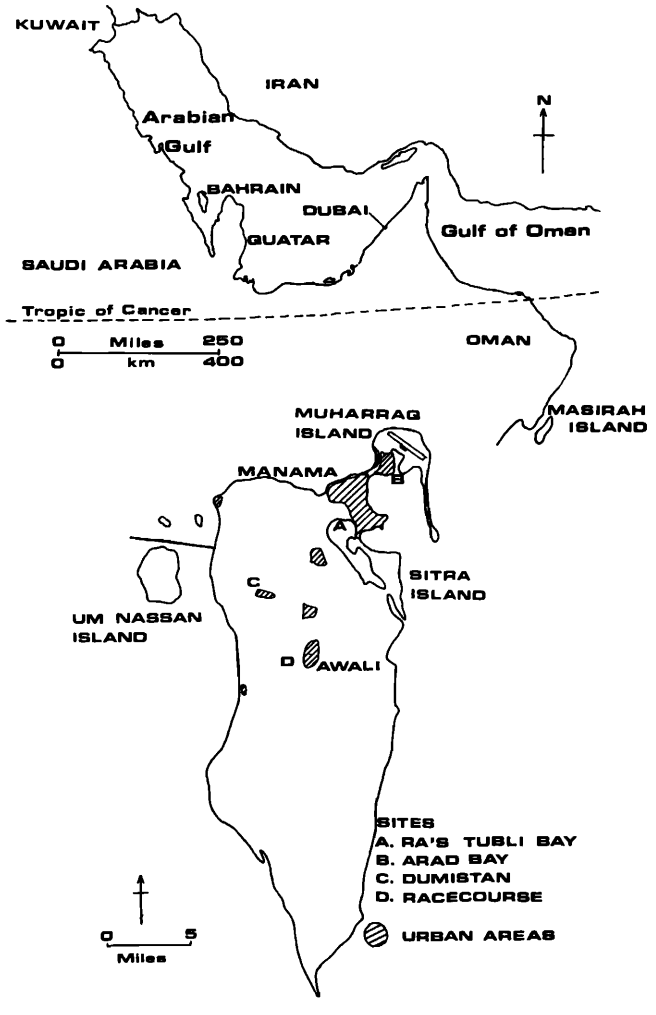

Figure 1. a). the location of Bahrain; and b). the location of survey sites in Bahrain.

Although the importance of the Sabkha to waders is unclear, it is probable that much of the area is too inhospitable to support large resources of food for such birds. However, waders do utilise the more enclosed tidal bays, and my coastal survey concentrated on the two largest of these, Ra's Tubli and Arad Bay (Figure 1b).

Counts were made also at two inland sites: the new racecourse near Awali and the sand pits near Durmistan (Figure 1b). The first site is a racetrack and golf course, with many acres of watered grass surrounding a large freshwater pool and a smaller sewage settlement pool nearby. Durmistan sand pits consist of a large area actively used for sand extraction and is therefore subject to frequent disturbance. The sand pits contain pools of water which are highly saline and so probably of little use for feeding.

Table 1 shows the maximum and minimum numbers of waders using each site between 6 September and 3 October 1982. Each site was visited between 6 and 12 times, shortly before high tide at coastal sites, and during early morning or evening at the inland sites (when disturbance was at a minimum).

The four commonest species were Curlew Sandpiper *Calidris ferruginea*, Little Stint *Calidris minuta*, Kentish Plover *Charadrius alexandrinus* and Lesser Sandplover *Charadrius mongolus*, all of which were observed in flocks of over 100 birds. However, these numbers are low in comparison to estimates reported by Hill and Nightingale (1984) for these species during their autumn passage in Bahrain: for example over 1500 Lesser Sandplovers in late June, "thousands" of Curlew Sandpipers and flocks of over 2000 Kentish Plover in August. Most of these were probably individuals on migration, although some do winter in the Arabian Gulf region. Curlew Sandpipers migrating through the Gulf are thought to winter in East and Southern Africa (Wilson, Czajkowski and Pienkowski 1980), but this species was not reported at Dubai by Smart *et al* (1983). Similarly, I recorded Broad-billed Sandpipers in Bahrain, with over 100 birds in one flock, and yet they were not observed at Dubai (Smart *et al* 1983). Cramp and Simmons (1983) suggest that some individuals of this species winter in the Arabian Gulf. However, the records reported by Hallam (1980) and Hill and Nightingale (1984) indicate that, at least in the mid-Gulf, this species is primarily a migrant. It seems unlikely that the absence of the two species from Dubai simply reflects a lack of suitable habitat. A possible explanation is that Broad-billed Sandpipers and Curlew Sandpipers use a migration route over the Arabian Peninsula, rather than a coastal route along the Arabian Gulf to the Indian Ocean. In autumn up to 3000 Curlew Sandpipers and smaller numbers of Broad-billed Sandpipers occur also at Masirah Island (R.A.F.O.S. 1978, Pomeroy 1980) adjacent to Oman in the Indian Ocean. (However these birds could originate from different populations and arrive via a route direct from Asia.) A third possibility could be that Curlew Sandpipers and Broad-billed Sandpipers over-fly Dubai and only use a few sites (such as Bahrain) as migration staging posts. Although Jennings (1981) lists Curlew

Table 1. Wader counts at selected sites in Bahrain in September 1982.

	SITE					
	Ra's Tubli	Arad Bay	Misc Coast	Dumis-tan	Race-course	Total
Oystercatcher						
Haematopus ostralegus		5				5
Black-winged Stilt						
Himantopus himantopus					10	10
Ringed Plover						
Charadrius hiaticula	10-30	10	5	1-10	2	30-60
Lesser Sandplover						
Charadrius mongolus	10-100+	15	10-20	1-20		35-160+
Greater Sandplover						
Charadrius leschenaultii	10-50+					10-50+
Kentish Plover						
Charadrius alexandrinus	10-200+	10-50	10	20-30	15-35	60-300+
Lesser Golden Plover						
Pluvialis dominica	2					2
Grey Plover						
Pluvialis squatarola	1-15	15	2			20-30
Sociable Plover						
Chettusia gregaria					1	1
White-tailed Plover						
Chettusia leucura	1					1
Sanderling						
Calidris alba	3					3
Little Stint						
Calidris minuta	15-200+	+		10-40	10-20	50-250+
Temminck's Stint						
Calidris temminckii	1					1
Curlew Sandpiper						
Calidris ferruginea	20-200+	30+		10-60	30-60+	100-350+
Dunlin						
Calidris alpina	1-5	1-5		1-10		3-20
Broad-billed Sandpiper						
Limicola falcinellus	10-100					10-100
Ruff						
Philomachus pugnax	1			1-5	2-6	4-12
Snipe						
Gallinago gallinago	1-6					1-6
Bar-tailed Godwit						
Limosa lapponica	2-4					2-4
Whimbrel						
Numenius phaeopus		1	1			2
Curlew						
Numenius arquata	8	10+				18+
Spotted Redshank						
Tringa erythropus	1					1
Redshank						
Tringa totanus	3-20+		10	1-2	5-10	20-40+
Marsh Sandpiper						
Tringa stagnatilis					1-2	1-2
Greenshank						
Tringa nebularia	1-6+	1	5-15+		2+	10-20+
Green Sandpiper						
Tringa ochropus	1-2				2+	1-4+
Wood Sandpiper						
Tringa glareola	1-2				1	2-3
Terek Sandpiper						
Xenus cinereus	1-20+		2			20+
Common Sandpiper						
Actitis hypoleucos	1-3		1			1-4
Turnstone						
Arenaria interpres	1		60+	5-50+		70-100+

Sandpipers and Broad-billed Sandpipers to be passage migrants in all the countries of the southern shore of the Arabian Gulf, no details are given and the relative importance of each country to these species cannot be evaluated.

These observations indicate that the waders using Bahrain during migration differ significantly from those species using Dubai at the same time of year. In the case of Broad-billed Sandpipers and Curlew Sandpipers, Bahrain may be an important, and possibly isolated, migration staging post. Considering the meagre information on this subject and the limited availability of migration staging posts for waders, further research on wader migration and the role of feeding sites as staging posts in the Arabian Gulf is desirable.

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FURTHER OBSERVATIONS ON THE WING PLUMAGE OF DUNLINS

by Jadwiga Gromadzka

This note is a further contribution to the discussion about Dunlins *Calidris a. alpina* with "adult buff" coverts (Gromadzka and Przystupa 1984, Clark 1984) and about the value of brownish-buff fringed feathers (the remains of juvenile plumage) in the inner median coverts as the feature differentiating 2nd-year from older Dunlins (Prater *et al.* 1977).

As was shown earlier (Gromadzka and Przystupa 1984), adult Dunlins with new "adult buff" median coverts have been appearing at Gdansk Bay (Poland). It was noticed that these birds, as with 2nd-year birds, moult their primaries earlier than individuals older than their second year (Gromadzka in press). Clark (1984), who proposed the term "adult buff" coverts, suggested that these may be 2nd-year birds.

Observations on wing moult and the appearance of the median coverts before and after moult were made in 1984 during Dunlin ringing operations in two places at Gdansk Bay: Vistula mouth and Reda mouth (c. 45 km NW of Vistula mouth). 1209 adult Dunlins, trapped in August and September, were examined for the moult-plumage analysis; all were aged as either 2nd-year or after 2nd-year, according to Prater *et al.* (1977) (i.e. 2nd-year - birds with brownish-buff fringed feathers in the inner medians; after 2nd-year - without brownish-buff feathers in the inner medians).

Amongst those birds analysed, 17% were individuals with new "adult buff" coverts; most of these were in the group of 2nd-year Dunlins, but 8% of the birds with "adult buff" medians did not have any brownish-buff colour in the inner medians (Table 1). 15% of the Dunlins examined had new inner medians with brownish-buff fringes, implying that these birds, if caught next spring or early summer, would be aged as 2nd-year, although their real age would be 3rd year, at least. Distinguishing old and new feathers in the inner medians may seem to be difficult for inexperienced persons, but after handling many birds it is easy to see the difference in colour intensity (old feathers are more pale). Thus, a proportion of birds which are aged as 2nd-year are, *de facto*, older. The same discovery was earlier made by J. Vuorinen (Vuorinen *et al.* 1979, in litt.) amongst Dunlins ringed at Ottenby (Sweden, August 1977) where 13% had new inner medians with brownish-buff fringes. He found that a shape difference exists between 2nd-year (=juvenile) inner medians and those of older birds. This feature needs checking on a larger sample.

Table 1. Numbers of Dunlins examined for moult-plumage analysis at Gdansk Bay between 4 August and 30 September 1984.

age[1]	all birds	birds with "adult buff" coverts
2nd-year[2]	479	192
>2nd-year	730	17
total	1209	209

[1] age estimated according to Prater *et al.* (1977);
[2] included here are also 185 (15%) birds with new inner medians with brownish-buff fringes.

There are also recaptures of ringed Dunlins indicating that the colour of the medians is not necessarily connected with their age. For example, a Dunlin ringed as a juvenile during the autumn in Germany (Schleswig-Holstein) was controlled after two years as a 2nd-year bird at the Vistula mouth. Another Dunlin ringed as a juvenile in Great Britain was controlled at the Vistula mouth after eight years and had new "adult buff" coverts. Two Dunlins ringed as 2nd-year birds at the Reda mouth in 1983 were controlled there next year, again as 2nd-year birds. Another Dunlin ringed at the Vistula mouth in 1983 with "adult buff" coverts again had new "adult buff" coverts when controlled at the same place in the following year.

The brownish-buff colour in the new medians of Dunlins has appeared in birds with much advanced moult, i.e. in those individuals which had started the moult early (Gromadzka in press). Several categories of Dunlins may start the moult early: