Counts of shorebirds at Barr al Hikman and Ghubbat al Hashish, Oman, winter 1989-90

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INTRODUCTION

The migration of shorebirds along what may be described as the West Asian Flyway is comparatively poorly understood (Summers *et al.* 1987) and the setting of realistic conservation criteria based on population estimates is not yet possible. Nevertheless, enough knowledge exists to demonstrate that this route, following the rivers of west and central Siberia to the Caspian and Black Seas and onwards to Iran, the Arabian Gulf, Pakistan, India, Sri Lanka and east and southern Africa is of considerable importance to shorebirds breeding in Scandinavia and west and central Siberia (Behrouzi-Rad, 1991; Chernichko *et al.* 1991; Curry 1978; Etheridge 1980; Rogers 1988; Smart *et al.* 1983; Summers *et al.* 1987, Tucker 1985; Uttley *et al.* 1988; Zwarts *et al.* 1991). The identification of important sites and estimation of population sizes was highlighted as a priority requirement to further knowledge of shorebirds in this region by Summers *et al.* (1987).

The Barr al Hikman area, on the central-eastern coast of the Sultanate of Oman, has been known to be of importance for migratory wetland birds for several years (Gallagher & Woodcock 1980). However, despite its reputation as a site of importance for birds, no systematic survey had ever been carried out, primarily because of the huge difficulties in covering such a large area.

In order to achieve such a count, a visit by the authors was organised between 23 December 1989 and 12 January 1990. The primary aim of our visit to Barr al Hickman was to assess the importance of the area to wintering shorebirds and other wildfowl by counts of birds in mid-winter. This time was chosen to coincide with the midwinter counts organised by the Asian Wetland Bureau (AWB) and the International Waterfowl and Wetlands Research Bureau (IWRB) (Perennou *et al.* 1990). Our second aim was to identify the important roosting and feeding areas, and describe them in terms of habitats available. Thirdly, we aimed to catch as many birds as possible in order to assess breeding origins from biometrics and plumage features. Finally we aimed to investigate some aspects of the ecology of shorebirds at Barr al Hickman, including abundance of prey species.

This paper presents the results of our primary aim, namely the counts of wetland birds and an assessment of the importance of the area. Further results achieved during the study are contained in a full report (Green *et al.* 1992).

SITE DESCRIPTION

Barr al Hikman lies 340 km south of Muscat on the central-eastern coast of Oman (Figures 1 & 2). It is a low lying peninsula made up largely of sand and sabkah - a mixture of sand, mud and salt - and is almost devoid of vegetation. It is surrounded by extensive tidal mudflats. The results are presented separately for the east coast of the Barr and for the bay of Ghubbat al Hashish. This is partly because of the natural geographic split between the exposed, oceanic side and the sheltered bay side, but there were also noticeable differences between the shorebird and invertebrate communities in each area.

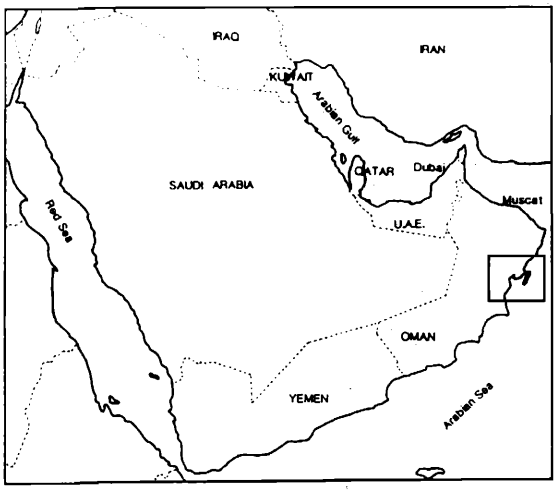

Figure 1. The Arabian Peninsula, showing the position of Oman and the location of Barr al Hikman (inset, Figure 2).

The northernmost extent of the study area was Khawr Barr al Hikman, a large lagoon open to the sea at both ends and with a complex of sandy mudbanks and permanent channels. The coast south of this has a gently sloping shore, exposing very large mudflats at low tide. These mudflats gradually narrow towards the south of the Barr, and there are sections of coral reef. Behind the shore are low-lying dunes, some scrub and sabkah. Much of this coast is accessible by vehicle.

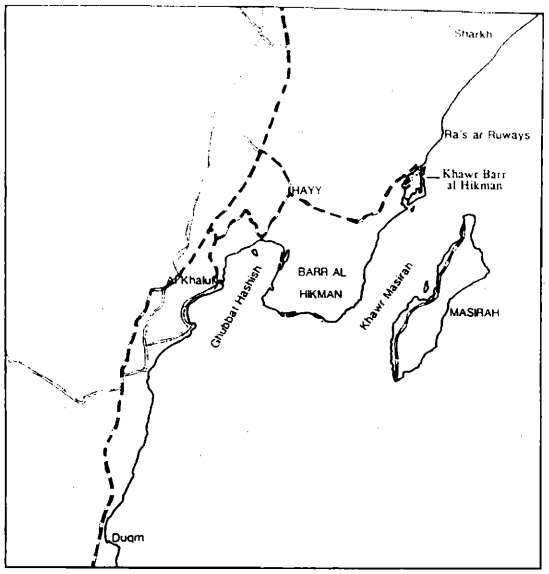

Figure 2. Barr al Hikman, showing the towns of Hayy and Al Khaluf, the Ghubbat al Hashish and Khawr Barr al Hikman, and its position relative to Masirah Island.

The south and south-west shore of Barr al Hickman has intermittent reef sections, creating lagoons and mudflats behind them at low tide. Behind the shore is firm sand, gravel and sabkah.

Ghubbat al Hashish is a large shallow bay with extensive mudflats at low tide. The shores vary between sabkah, which merges with the mudflats in places, sand, low dunes and short cliff sections. There are several islands within the bay - the largest, Mahawt, is fringed with extensive, well developed mangrove *Avicennia marina.*

Further details of the area are given in Green *et al.* (1992).

METHODS

At high water, birds roosted at the high water mark, or inland on the sabkah. In general, birds did not form distinct roosts, probably because of the topography of the coast, which was largely devoid of promontories or sandbanks. This meant that at high water birds were spread out more or less uniformly along the tide edge, although some concentrations did occur. As a result it was not possible to isolate roosts and make repeat counts of them throughout the survey as had been planned, and an alternative plan was employed.

The period over high water for which birds were countable lasted about four hours. During this time we surveyed as large a length of coastline as possible on each day. At the end of each day's counting period we marked our position and returned to the same point the following day to restart and continue along the coast. This method assumed that the distribution of birds was not changing from day to day. Our subjective impression, from travelling past previously counted areas on subsequent days was that our assumption was valid. Birds were counted using 10 x 40 binoculars and 15-40 x telescopes, either from a vehicle which was used as a hide, or on foot. In some areas access was difficult, and considerable distances (up to 5 km) had to be walked to reach counting areas.

Where possible birds were identified to species level, but in some situations, i.e. poor visibility, or very dense flocks, we had to assign birds to species groups e.g. wader spp., medium-small calidrids. The problem is dealt with in the results section.

RESULTS

In Table 1 are presented, separately, the total west and east coast counts of shorebirds.

Before we look more closely at the distribution and abundance of birds we should first highlight some difficulties we had identifying species. As described in the methods section we occasionally had difficulties in specific identification due to physical conditions or behaviour of the birds. These problems were particularly severe in the following species groups.

The two sandplovers, Greater *Charadrius leschenaultii* and the Lesser *C. mongolus*, present at Bar al Hikman are difficult to identify specifically when in large groups and by unfamiliar observers. Consequently, most (10,083 out of 10,327) were not assigned to a species but to sandplover spp.. Although more greater than Lesser Sandplovers were specifically identified, this should not be taken as an indication that the former were more common; other workers have found Lesser Sandplovers to outnumber greaters by 5-10:1 (Dr J Eriksen pers. comm.).

The second difficult species group was Bar-tailed Godwit *Limosa lapponica*, Great Knot *Calidris tenuirostris* and Grey Plover *Pluvialis squatarola.* These species, although comparatively simple to identify when alone or in loose flocks were very difficult to separate when they were in the dense flocks they formed along the east coast of the Barr. This was particularly so for the Great Knot/Bar-tailed Godwit and was compounded by our lack of familiarity with the former species, which was not expected to occur in such large numbers. It is likely that numbers of Great Knot were underestimated by our counting, rather than overestimated. As with so many bird identification problems this became less taxing as we became familiar with the birds and the local conditions.

Table 1. Counts of shorebirds in the Barr al Hikman region between 23 December 1989 and 12 January 1990.

SPECIES	EAST COAST	WEST COAST	TOTAL
CORMORANTS			
Great Cormorant *Phalacrocorax carbo*	2,700	5,466	8,146
Socotra Cormorant *P. nigrogularis*	0	1,085	1,085
HERONS & EGRETS			
Green Heron *Butorides striatus*	0	1	1
Squacco/Indian Pond Heron *Ardeola ralloides/grayii*	0	7	7
Western Reef Heron *Egretta gularis*	1,023	735	1,758
Little Egret *E. garzetta*	1	0	1
Great White Egret *E. alba*	12	226	238
Grey Heron *Ardea cinerea*	73	515	588
Purple Heron *A. purpurea*	0	1	1
SPOONBILLS			
White Spoonbill *Platalea leucorodia*	26	95	121
FLAMINGOES			
Greater Flamingo *Phoenicopterus r. roseus*	3,837	3,651	9,231
WADERS			
Oystercatcher *Haemotopus ostralegus*	2,969	1,408	4,377
Black-winged Stilt *Himantopus himantopus*	0	7	7
Avocet *Recurvirostra avosetta*	2	46	48
Crab Plover *Dromas ardeola*	2,149	794	2,943
Ringed Plover *Charadrius hiaticula*	1	2	3
Kentish Plover *C. alexandrinus*	103	117	220
Lesser Sandplover *C. mongolus*	0	65	65
Greater Sandplover *C. leschenaultii*	160	19	179
Sandplover spp. *C. mongolus/leschenaultii*	3,423	660	100,083
Plover spp. *Charadrius* spp.	3,035	285	3,320
Pacific Golden Plover *P. fulva*	0	34	34
Grey Plover *Pluvialis squatarola*	1,941	648	2,589
Great Knot *Calidris tenuirostris*	1,104	89	1,193
Sanderling *C. alba*	1,151	557	1,708
Little Stint *C. minuta*	2,152	3,231	5,383
Curlew Sandpiper/Dunlin *C. ferruninea/alpina*	22,928	9,269	32,197
Broad-billed Sandpiper *C. falcinellus*	366	1,282	1,648
'Medium-small' Calidrids *C.ferruginea/alpina/falcinellus*	10,940	1,875	12,815
'Medium-small' wader spp. *Tring/Calidris* spp.	3,210	3,248	6,368
Bar-tailed Godwit *Limosa lapponica*	19,720	11,170	30,890
Whimbrel *Numenius phaeopus*	162	63	225
Curlew *N. arquata*	869	850	1,719
Slender-billed Curlew *N. tenuirostris*	0	2	2
Redshank *Tringa totanus*	10,350	2771	13,121
Marsh Sandpiper *T. stagnatilis*	9	6	15
Greenshank *T. nebularia*	238	99	337
Terek Sandpiper *Xenus cinereus*	101	358	459
Common Sandpiper *Actitis hypoleucos*	4	2	6
Turnstone *Arenaria interpres*	801	923	1724
GULLS & TERNS			
Sooty Gull *Larus hemprichii*	111	6,298	6,409
Great Black-backed Gull *L. ichthyaetus*	26	720	746
Black-headed Gull *L. ridibundus*	1	1	2
Slender-billed Gull *L. genei*	9,837	10,098	19,935
Herring/Lesser Black-backed Gull *L. argentatus/fuscus*	3,374	18,417	21,791
'Gull' spp.	100	741	841
Gull-billed Tern *Gelochelidon nilotica*	22	69	91
Caspian Tern *Strena caspia*	158	1,208	1,366
Crested Tern *S. bergii*	1,660	2,379	4,039
Lesser Crested Tern *S. bengalensis*	27	2	29
Sandwich Tern *S. sandvicencis*	2,321	8,835	11,156
White-cheeked Tern *S. repressa*	2	2	4
Little Tern *S. albifrons/saundersii*	8	26	34
'Tern' spp.	100	741	841
TOTAL	**113,220**	**107,458**	**220,678**

The final, and perhaps most surprising and problematical difficult species were the 'medium-small calidrids' comprising Dunlins *Calidris alpina,* Curlew Sandpipers *C. ferruginea,* and Broad-billed Sandpiper *Limicola falcinellus.* These three species formed dense roosts in which individual birds were hard to pick out, let alone identify. Furthermore, Curlew Sandpipers and Dunlin, which are relatively simple to discriminate between in western Europe were much more similar in Oman. The Dunlin were much larger than in western Europe, and the white rump of Curlew Sandpipers (a usually reliable diagnostic feature in flight) was often partially obscured by dark feathering (confirmed on birds caught and examined). The large size of middle-eastern wintering Dunlin has been noted elsewhere (Uttley *et al.* 1988) and it is likely that they are of a more eastern race, perhaps *C. a. sakhalina.* In spite of this we are confident that 90% or upwards of our 'medium-small calidrids' were Dunlin, since the great majority of those that were positively identified were of this species. The problems of identifying Broad-billed Sandpipers were less severe and were almost entirely due to their smaller numbers and habit of roosting in these dense 'medium-small calidrid' flocks.

A total of 220,678 shorebirds of 53 species were counted during the whole survey. Of these 113,220 were on the east coast of the Barr, and 107,458 on the west coast or in Ghubbat al Hashish. Waders totalled 133,679 of 26 species, or 60% of all birds counted, and just two species, Dunlin and Bar-tailed Godwit (but see note on identification problems above), contributed to about half this total. Of special note were the totals of 1,193 Great Knot (minimum, see above), 2,943 Crab Plover *Dromas ardeola* and 1,648 Broad-billed Sandpiper (minimum) along with two Slender-billed Curlew *Numenius tenuirostris.* Of the 86,999 non-waders, the majority were gulls (46,993), mostly Slender billed *Larus genei,* Herring/Lesser Black-backed *L. argentatus/fuscus* or Sooty *L. hemprichii,* or terns (17,562) mostly Sandwich *Sterna sandvicensis* or Crested *S. bergii.*

A comparison of the shorebird communities of the two coasts of Barr al Hikman reveals some major differences between them. Waders were far more abundant on the east coast of the Barr (87,798) than in Ghubbat al Hashish or on the west coast (45,881). Conversely, gulls (36,544) and terns (13,262) were more common on the west coast and in Ghubbat al Hashish than on the east coast (13,449 and 4,300 respectively). Cormorants were far more abundant in Ghubbat al Hashish than on the open east coast of the Barr. Indeed, Socotra Cormorants *Phalacrocorax nigrogularis* were only found in Ghubbat al Hashish, and all of these were on the island of Abb, where they (may?) breed. Great Cormorants *P. carbo* were present in small numbers on Abb, but most were found on the eastern shore of Ghubbat al Hashish, where they roosted on sandbars. Grey Herons *Ardea cinerea* and Great White Egrets *Egretta alba* were also far more abundant in Ghubbat al Hashish than on the Barr's east coast.

Among the waders further differences between the two coasts were apparent. Crab Plovers, Oystercatchers *Haemotopus ostralegus,* Grey Plovers, Bar-tailed Godwits, Redshank *Tringa totanus,* Great Knot, Dunlin and Curlew Sandpipers were all most abundant on the Bar's east coast, while sandplovers and Broad-billed Sandpipers were more abundant in Ghubbat al Hashish.

DISCUSSION AND CONCLUSIONS

It is clear from a cursory examination of the numbers of birds counted during this survey that the wetlands surrounding Barr al Hikman are very important for migratory shorebirds. It is impossible to assess the scale of its importance in a regional context using criteria based on wintering population sizes, but no other sites in the Middle East are currently known which hold comparable numbers of birds in winter. Counts from the coast of Iran showed that up to 200,000 waders are present in mid-winter, and estimates from Scott and Carp's counts from the Tigris/Euphrates delta area suggest that approximately 80,000 waders may winter there. Zwarts *et al.* counted almost 30,000 waders on 1,000 hectares of mudflats in midwinter in Saudi Arabia. They tentatively suggest that Saudi Arabian coasts support 250,000 waders in winter, and that the Arabian Gulf as a whole may support 4 million, although their assumptions on which predictions are based are probably not valid for all species, *i.e.* that they sampled a sufficiently representative spectrum of habitats. Nevertheless, their calculations give a figure which we can tentatively utilise to establish the importance of the Barr al Hikman shores. If their figure of 4 million wintering birds is accurate and taken to include the non-Gulf coast of Oman (an insignificant further source of error), then Barr al Hikman/Ghubbat al Hashish supports over 3% of the region's waders in mid-winter.

We can also use the results of the recent Asian waterfowl censuses (Perennou 1990) to put the counts into regional perspective. Bar al Hikman was the second most important (in numerical terms) of wetlands counted in the 1990 Asian Waterfowl Census, one of only four sites to hold more than 200,000 birds. Although such figures give a startling indication of the importance of Barr al Hikman for wintering shorebirds, more biologically relevant criteria would be based on south-west Asia alone, since many species' distributions are biased to the east or west of the Asian landmass, and birds wintering in central or eastern Asia probably originate from different breeding populations to those in the Middle East. Using these figures shows the wetlands around Barr al Hikman to be still more important.

In addition to the large numbers of shorebirds using the intertidal area around Barr al Hikman in mid-winter, it is also likely that other birds use the area during migration. It is well established that birds wintering in south and east Africa pass through west Asia on their way to and from breeding grounds. At other sites in the Gulf, waders are