Notes on the birds of the eastern Rub’ al Khali, Saudi Arabia

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Summary During an NCWCD expedition to the eastern Rub’ al Khali (Saudi Arabia), from 12 February to 13 March, 49 bird species were recorded including nine proven or probable breeders (six within the sands proper). The most common species were Hoopoe Lark Alaemon alaudipes and Brown-necked Raven Corvus ruficollis (resident) and Desert Wheatear Oenanthe deserti and Desert Warbler Sylvia nana (wintering). A probable breeding site for Moorhen Gallinula chloropus was found, and a Crab Plover Dromas ardeola was seen, suggesting an overland passage. Open sandy areas with a good cover of bushes form the habitat used by most species. Extreme aridity and the absence of trees and annual plants are probably the major factors limiting diversity and density of species.

Due to obvious logistical problems, the avifauna of the great sand sea of southern Arabia, the Rub’ al Khali (also known as the Empty Quarter or the Sands) has never been properly assessed, and only scattered notes have been published on the subject (Ticehurst and Cheesman 1925; Kinnear 1931, 1934; Philby 1933; Thesiger 1950, 1959). During February and March 1990, with logistical support provided by the Frontier Forces of the Kingdom of Saudi Arabia, an expedition to the Uruq al Mu’taridah area in the eastern part of the Rub’ al Khali was carried out by the National Commission for Wildlife Conservation and Development, with the aim of investigating the biological resources of the area. This offered a unique opportunity to study the region’s birdlife.

Plate 1. High crescentic dunes in Uruq al Shaybah (Saudi Arabia), February, after heavy rain. Relatively small underlying sabkhas are exposed, and the one shown here is partly inundated. (Bruno Pambour)
Figure 1. Route followed by the NCWCD expedition to the eastern Rub’ al Khali (Saudi Arabia), 12 February to 13 March 1990.
Plate 2. Star dunes, the predominant form in the south-east of Uruq al Mu’taridah (Saudi Arabia), here to the north of Sahmah station. Exposed substrate (sabkha and gravel plain) is more extensive than the sands. (Bruno Pambour)

STUDY AREA

The Rub' al Khali is a sedimentary basin elongated in a SW–NE direction across the Arabian Shelf, falling over a distance of about 1,000 km from an elevation of about 800 m in the south-west almost to sea level in the north-east. It is the largest continuous expanse of sand desert on earth and occupies about 640,000 km², more than the area of France. The Uruq al Mu’taridah, the south-eastern part of the sand sea, includes some of the most variable and spectacular dune topography on earth. The region surveyed represents a vast, lowland, inwardly draining basin, with immense numbers of wind-driven dunes on a level substrate of sabkhas (salt flats) at 80–100 m above sea level. Ten natural habitat types can be distinguished, based on geomorphological features:

- Sabkha: unvegetated flat ground with evidence of salt.
- Gravel plain: fairly flat plain; no vegetation.
- Eroded gravel plain: some relief apparent due to drainage (small wadis with vegetation), underlying rock appearing in some places.
- Vegetated gravel plain.
- Flat sandy plain.
- Ripples: gravel plain or sabkha with small wave-like dunes.
- Sand sheet: thick continuous layer of sand over sabkha or gravel.
- Low dunes: less than 5 m high.
- Larger dunes.
- Wetlands.
The four stations of the Frontier Forces which were visited as part of the expedition (Al Khoshum, Shabita, Ahda, Sahmah: Figure 1) have also to be considered as a separate habitat type. They are all permanent settlements, each occupied by an average of 20 people and containing a few small trees. Water and fuel are supplied to them by huge army trucks which cross the desert throughout the year.

The major dune types can be summarized as follows (for more details see the excellent synthesis by Llewellyn 1988).

- Large simple crescentic (barchan) dunes. Up to 300 m high, lying along a WNW–ESE axis. Their flanks are covered by smaller crescentic dunes. Small underlying sabkhas are exposed (see Plate 1). Present mainly in the north, west, and central part of the area (Al Kidan, Uruq al Shaybah).

- Complex crescentic dunes. Arranged in linear chains on a sabkha substrate, with exposed sabkha tending to cover a greater area than do the dunes themselves. Star dunes on their crests represent the transition zone between crescentic and true star dunes. Occur in the eastern parts of the Uruq al Mu’taridah.

- Small simple crescentic dunes. Underlying substrate completely covered except for a few relict lake beds. These characterize the north and north-west margin of the area (Al Liwa).

- Star dunes. Exposed substrate (sabkha and gravel plain) is generally more extensive than the dunes (Plate 2). Predominant in the south-east of the region.

- Linear dunes. Found on the western margin of the Uruq al Mu’taridah (Hamarir al Kidan, Uruq Musa).

Plate 3. *Cornulaca* bushes on low dunes in the south-east of Uruq al Mu’taridah (Saudi Arabia), February. *(Bruno Pambour)*

Weather data (two years' records) are available from the station of the Meteorological and Environmental Protection Agency in the Shaybah area at 22°21'N 54°03'E. For February these show average daily minimum and maximum temperatures of 16 and 28°C, and an absolute minimum and maximum of 9 and 37°C. The
eastern Rub’ al Khali is subject to morning and evening fogs and heavy dews in the cool season. Average rainfall is very low (less than 50 mm a year) and erratic.

Despite the extreme aridity of the Rub’ al Khali, vegetation within the dunes is almost omnipresent, and unique in kind and composition; the sands of the region are more densely vegetated than the other less hyperarid rock deserts and gravels plains of the Kingdom. The shrub-dominated vegetation is very diffuse but is well distributed on the open sandy areas, interrupted by sterile interdune floors (Plate 3). The limitation of moisture to fogs, dews, and erratic rain showers has, however, restricted the botanical diversity: the expedition recorded only 20 perennial species within the main body of the sands, half of which were rather abundant; 17 additional species were recorded from the margins of the Rub’ al Khali. Many of the species found to comprise the major perennial components of the vegetation (given here with their Arabic names) were endemic: the shrubs Calligonum arabicum (abal), Cornulaca arabica (haad), Tribulus arabicus (zahr), and Zygophyllum mandavillei (harm), and the herb Limeum arabicum (burkan); other more widespread perennials present included sedge Cyperus conglomeratus (aandab) and the shrubs Halothammus (tahmah), Salsola cyclophylla (araad), and Seidlitzia rosmarinus (shanaan). The low rainfall means that annuals are, as a rule, absent from the region, and grasses are represented in very restricted habitats only by the two annual species Stipagrostis plumosa (nasee) and Centropodia forskalii (hojain). Trees are virtually absent from the inner sands, though a few Tamarix pycnocarpa up to about 2–3 m tall are present where water is available near the ground surface. (Mandaville 1986, 1990; Chaudhary and Al-Juwayed 1990.)

In the south-eastern part of the Uruq al Mu’taridah, at 20°41’N 54°42’E, we discovered a natural spring-fed wetland not marked on existing maps. This site (referred to here as the unnamed wetland) comprised large pools and reedbeds of Phragmites and covered over 40 ha (Plate 4).

Plate 4. Large pool with reedbed of Phragmites in the unnamed natural wetland in the Uruq al Mu’taridah (Saudi Arabia), February. (Bruno Pambour)
METHODS

Field work was carried out by two observers for five hours per day from 12 February to 13 March 1990, most observations being made from a moving vehicle or during long walks (Figure 1). Some records of birds of prey were made from an NCWCD aircraft. Two long vehicle transects were carried out, driving at a speed of 40 km per hour.

Itinerary

12 February. Al Khoshum to Shabita.
13 February. To Ahda.
14 February. To Sahmah, and on to establishment of first main camp, north of Sahmah (20°45'N 54°44'E).
21 February. To Ahda.
22–23 February. To Shabita (after heaviest rainfall for 20 years, over 100 mm in 12 hours).

24 February. Establishment of second main camp, near Shabita.
6 March. To Al Kidan area.
7–8 March. To Ra's al Mihrad area.
9 March. To Shabita.
10–11 March. To Al Khoshum.

SYSTEMATIC LIST

Marsh Harrier *Circus aeruginosus*. Part of a skull found near the unnamed wetland was identified as this species by P. Bayle after comparison with a reference collection. Evidently a passage migrant.

Pallid Harrier *Circus macrourus*. Six single individuals seen hunting on sand dunes and gravel plains from 12 February to 7 March: two near Shabita, two in Al Kidan, one in Shaybah, and one north-west of Sahmah.

Long-legged Buzzard *Buteo rufinus*. Ten widely distributed records, including one of two birds together, from open sandy areas, sabkha, and gravel plains: 22°47'N 53°00'E, 22°08'N 54°20'E, 21°26'N 54°12'E, 22°14'N 53°20'E, 21°42'N 51°58'E, 21°40'N 51°20'E, 20°02'N 54°35'E, 22°08'N 54°52'E, 22°08'N 54°07'E, 22°28'N 53°38'E. This raptor probably breeds at very low densities, though it may be limited by a lack of nest sites and birds from outside the Rub' al Khali may disperse into the region during the winter.

Steppe Eagle *Aquila nipalensis*. One seen from an aircraft at 21°26'N 53°43'E (J. Grainger). An unidentified eagle in the Ghanim area on 20 February was also believed to be this species.

Kestrel *Falco tinnunculus*. Recorded in open sandy areas and gravel plains. One pair was established around Shabita station, and another pair at 21°30'N 55°10'E. Single birds were also seen at 22°08'N 54°20'E, 22°40'N 53°31'E, 22°52'N 52°32'E, 22°29'N 53°46'E, and 20°45'N 54°44'E. Presumably a resident breeder at very low densities.

Lanner *Falco biarmicus*. An escaped falconer’s bird with jesses was hunting wagtails at Shabita station on 3 March.
Water Rail *Rallus aquaticus*. At least five different birds were heard calling in reedbeds at the unnamed wetland. It seems most likely that this is a wintering population; breeding would not be impossible but would be remarkable. The nearest known breeding site, and apparently the world's most southerly, is 700 km northwest at Hofuf (Cramp and Simmons 1980; Bundy et al. 1989).

Moorhen *Gallinula chloropus*. At least four different birds were seen or heard in reedbeds at the unnamed wetland. It seems likely that this is an isolated breeding site, as populations exist in many (though mainly coastal) regions of Arabia.

Crab Plover *Dromas ardeola*. One bird was found very unexpectedly on the edge of a large inundated sabkha at 22°08'N 53°33'E, about 220 km from the Arabian Gulf coast, on 2 March (J. Grainger). This suggests the possibility of a previously unsuspected overland movement across southern Arabia. Inland records of the species seem to be otherwise unknown.

Stone Curlew *Burhinus oedicnemus*. A few birds appear to winter in open sandy areas. One was seen on 28 February at 22°28'N 53°36'E, and several tracks were found in different areas.

Herring Gull *Larus argentatus*. One flying north over Sabkha Mutti at 23°22'N 52°02'E, 70 km from the coast, on 11 March.

Sandgrouse *Gerocles*. A Frontier Force soldier at Shabita reported that unidentified sandgrouse occur each winter. Spotted Sandgrouse *P. senegallus* is the most likely to occur.

Palm Dove *Streptopelia senegalensis*. At least two pairs nesting in wooden boxes at Shabita station; present all year according to the soldiers.

Ring-necked Parakeet *Psittacula krameri*. A group of five flying north at Ra's al Mihrad (22°52'N 52°32'E) on 10 March.

Eagle Owl *Bubo bubo*. One resting in a *Cornulaca* bush in low dunes at 20°45'N 54°44'E on 18 February. This record, together with the first for the Rub' al Khali (about 900 km to the west, on Jabal Abu Shidad, 18°22'N 46°30'E: Mandaville 1982), indicates that the species does inhabit the region.

Little Owl *Athene noctua*. Two records in open sandy areas confirm the presence of this sedentary owl, presumably as a resident breeder. One was seen in Khawr Hamidan at 20°45'N 54°44'E (H. Tatwani) and another in the Ghanim area. Pellets found in an empty water tank at Ra's al Mihrad (22°52'N 52°32'E) were also thought to belong to this species.

Blue-cheeked Bee-eater *Merops superciliosus*. A group of five, presumably on passage, at Ra's al Mihrad (23°00'N 52°00'E) on 10 March.
Hoopoe *Upupa epops*. One bird, presumably on passage, was at Sahmah station on 5 March.

**Black-crowned Finch Lark** *Eremopterix nigriceps*. Present at seven sites, all in open sandy areas with good vegetation cover; evidently rather uncommon. Flocks of up to 15 were in Khawr Hamidan (20°45′N 54°44′E), nine including a singing male were seen at 20°38′N 54°27′E on 18 February, and five were recorded south of Ahda (20°41′N 55°03′E). Breeding in the region is certainly possible for both this species and the next, but, given their propensity for nomadism (e.g., Jennings 1980, Bundy et al. 1989), it cannot be assumed.

**Dunn’s Lark** *Eremalauda dunni*. One on a gravel plain at Al Khoshum (23°18′N 52°15′E) on 11 March.

**Hoopoe Lark** *Alaemon alaudipes*. The commonest of the resident small passerines, occurring in all open sandy areas and gravel plains with a good growth of bushes covering at least several dozen hectares. Over 20 records, in all areas visited, mainly singing and displaying males.

**Crested Lark** *Galerida cristata*. One on sandy ground near the expedition camp in the Al Kidan area (22°40′N 53°31′E) on 9 March.

**Swallow** *Hirundo rustica*. Single migrants were at Shabita station on 4 March and Al Khoshum station on 11 March. Also, one was found dead in an empty water tank at Ra’s al Mihrad (23°18′N 52°15′E).

**Red-rumped Swallow** *Hirundo daurica*. Singles recorded on 25 February and 5 March at Shabita station, and on 28 February in Al Kidan.

**House Martin** *Delichon urbica*. One was seen on 24 February at Shabita station. Another was found dead in the empty tank at Ra’s al Mihrad.

**Tawny Pipit** *Anthus campestris*. One at Al Khoshum station on 11 March.

**Meadow Pipit** *Anthus pratensis*. At least three individuals were seen at the unnamed wetland on 17 February.

**Water Pipit** *Anthus spinolella*. Two were with Meadow Pipits at the unnamed wetland on 17 February.

**Yellow Wagtail** *Motacilla flava*. Two migrants at the expedition camp in the Al Kidan area (22°40′N 53°31′E) on 9 March.

**Pied Wagtail** *Motacilla alba*. Six records of up to four birds in open sandy areas, gravel plains, wetlands, and human settlements. Recorded from 17 February to 11 March, at the unnamed wetland and in the Shabita and Al Kidan areas.

**Black Redstart** *Phoenicurus ochruros*. A male of the subspecies *phoenicuroides* at the expedition camp in the Al Kidan area (22°40′N 53°31′E) on 9 March.

**Isabelline Wheatear** *Oenanthe isabellina*. Four records of single birds, probably winter visitors, from open sandy areas and gravel plains: Shabita station on 13 February and 5 March, at 22°40′N 53°31′E on 2 March, and Al Khoshum station on 11 March. Also, two were found dead in the empty tank at Ra’s al Mihrad.

**Wheatear** *Oenanthe oenanthe*. Two migrants at the expedition camp in the Al Kidan
area (22°40'N 53°31'E) on 9 March.

**Pied Wheatear** *Oenanthe pleschanka*. Four records of migrants in open sandy areas and gravel plains of the Shabita and Al Kidan areas from 28 February to 4 March.

**Desert Wheatear** *Oenanthe deserti*. The commonest species seen, with 33 records, plus one found dead in the empty tank at Ra’s al Mihrad. Widespread in open sandy areas, sabkha, and gravel plains, its numbers being greatest where the density of bushes was highest. About half the records were of pairs, and single males were singing at 20°38'N 54°27'E on 18 February and at Shabita station on 4 March. The eastern Rub’ al Khali is, however, about 800 km south of the known breeding range (in Iran), so all records are presumably of winter visitors or migrants.

**Red-tailed Wheatear** *Oenanthe xanthopyrymina*. One at Shabita station on 3 March.

**Mourning Wheatear** *Oenanthe lugens*. Four records, presumably of winter visitors, in open sandy areas of the northern fringe of the Uruq al Mu’taridah, and one in the Ghanim area, all in February.

**Hooded Wheatear** *Oenanthe monacha*. One female, presumably a winter visitor, at a large sabkha (20°41'N 54°42'E) on 21 February.

**Blue Rock Thrush** *Monticola solitarius*. Three at Al Khoshum station on 12 February. The absence of trees appears to explain the lack of further records.

**Desert Warbler** *Sylvia nana*. Widespread in open sandy areas and gravel plains, with relatively dense vegetation (especially *Calligonum* bushes) in good condition; 23 records. The only *Sylvia* wintering in the Rub’ al Khali.

**Desert Lesser Whitethroat** *Sylvia curruca minula*. One at the expedition camp in Sabkha Mutti on 11 March. The absence of trees explains the lack of further records.

**Whitethroat** *Sylvia communis*. One found dead in the empty tank at Ra’s al Mihrad.

**Chiffchaff** *Phylloscopus collybita*. Three single migrants recorded from 28 February to 4 March in the Shabita area.

**Spotted Flycatcher** *Muscicapa striata*. One found dead in the empty tank at Ra’s al Mihrad.

**Isabelline Shrike** *Lanius isabellinus*. One at the unnamed wetland on 17 February.

**Great Grey Shrike** *Lanius excubitor*. Found in six open sandy localities: Shabita station (where one was singing on 24 February), Al Kidan (22°14'N 53°20'E and
22°40' N 53°31' E), west of Shaybah (22°30' N 53°40' E), Khawr Hamidan (20°45' N 54°44' E), and Ghanim (20°02' N 54°35' E). It is not possible to say whether the records relate to resident breeders or to winter visitors.

**Woodchat Shrike** *Lanius senator*. One migrant at 22°29' N 53°46' E on 27 February.

**Brown-necked Raven** *Corvus ruficollis*. Fairly common resident of open sandy areas and gravel plains, recorded from 12 localities distributed all over the surveyed area. A remarkably large group of ten birds was seen at 20°38' N 54°27' E on 18 February. On 13 February two nests were found, both in marker posts—empty drums raised 3 m above ground on poles (Plate 7); they were 30 and 60 km east of Shabita and held 5 and 6 eggs.

**House Sparrow** *Passer domesticus*. A small breeding population of at least 20 individuals was established on buildings at Shabita station; birds were seen carrying nest material.

**Trumpeter Finch** *Bucanetes githagineus*. A group of ten birds, presumably winter visitors, on gravel plains at Ramlat al Ghafah (20°58' N 55°21' E) on 14 February.

**Corn Bunting** *Miliaria calandra*. Five were found wintering on open sandy areas and gravel plains near Shabita on 13 February.

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**DISCUSSION**

The extreme aridity of the Rub' al Khali, its low ecological diversity, and the absence of annual plants and sizeable trees explain the low numbers of both species and individuals recorded. Altogether 49 bird species were identified during the expedition, but, given the shortness of the study period, its timing (late winter/early spring), and the paucity of other data from the region, it is impossible to be certain of the status of many of the species. However, nine can be classed as known or probable resident breeders (Long-legged Buzzard, Kestrel, Moorhen, Palm Dove, Eagle Owl, Little Owl, Hoopoe Lark, Brown-necked Raven, House Sparrow) and a further five as possibly breeding (Water Rail, Black-crowned Finch Lark, Dunn's Lark, Crested Lark, Great Grey Shrike). Excluding the waterbirds and species commensal with man, the study found only six probable and four possible residents of open sandy habitat. The breeding bird community of the Wahiba Sands in Oman includes all these ten species apart from Eagle Owl and Crested Lark (Gallagher 1988). Some typical desert birds which were expected to occur in the Rub' al Khali were not found; these included Houbara *Chlamydotis undulata*, Spotted Sandgrouse *Pierocles senegallus* (but see p. 86), and Bar-tailed Desert Lark
Ammoniicinctus, absences perhaps due mainly to the lack of annual plants. Bar-tailed Desert Lark was recorded by Kinnear (1931) at the edge of the sands at Al 'Ain, south of Ghanim.

The species assumed to be resident occurred almost always in well vegetated habitats with a relatively high density of bushes and where it had evidently been raining during the last few years. Good numbers of hares, small rodents, reptiles, and invertebrates such as scorpions and insects were also found at these sites. In areas which seemed to have suffered extended periods of drought and where most of the bushes were dead, no birdlife at all was found. Data from driven transects (Table 1) give a crude indication of the low density of birds, though the results are biased against the smaller and more terrestrial species: the two most common species, Desert Wheatear and Desert Warbler, are winter visitors, present only during the time of year when food availability is at its highest.

Table 1. Bird densities from driven transects in the eastern Rub' al Khali (Saudi Arabia), February 1990. Shaybah area: high crescentic dunes with small sabkhas, 203 km, 13 February. Ramlat al Ghafah area: gravel plains and sabkhas predominant, with star dunes, 160 km, 22 February. Figures are numbers of individuals per 100 km.

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<th>Shaybah</th>
<th>Ramlat al Ghafah</th>
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<td>Long-legged Buzzard Buteo rufinus</td>
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<td>Kestrel Falco tinunculus</td>
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<td>Black-crowned Finch Lark Eremopterix nigriceps</td>
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<tr>
<td>Hoopoe Lark Alaemon aiaudipes</td>
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<td>1.3</td>
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<td>Isabelline Wheatear Oenanthe isabellina</td>
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<td>Desert Wheatear Oenanthe deserti</td>
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<td>Brown-necked Raven Corvus ruficollis</td>
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Passage migrants figured prominently in the species seen, even though the study period covered only the early part of the spring migration. Numbers and diversity of migrants would undoubtedly have been greater if the survey had been extended further into the passage season.

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REFERENCES


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