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Breeding of marine birds on Farwa Island, western Libya

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The Libyan coast is characterised by many wetlands that are used as stopover routes for many migratory marine birds. They provide food, shelter and nesting grounds for many avifauna during their migration from their home to wintering grounds. Farwa Island, which is located at the furthestmost western part of Libya, is considered to be one of the most important coastal wetlands in Libya. It has unique diverse habitats of extensive tidal areas and mudflats and an accumulation of *Posidonia oceanica* on the northern part of the island and at Ras-Attalgha, beside the plant cover of the island itself. These conditions provide good nesting grounds for some species such as *Sterna albifrons* and *Sterna hirundo*. This study was conducted during January–December 1999, June 2001 and May 2004 on migratory and resident marine birds that inhabit the western part of Farwa Island and Ras-Attalgha. It recorded the breeding of *Sterna caspia* for the first time in Libya and some behavioural indicators as evidence of breeding of *Charadrius alexandrinus* and *Tringa totanus* in this area as well. Human activities — especially fishing, traffic from fishing boats and tourism — are considered to be major disturbance factors that may have a negative impact on successful breeding of birds that utilise the diverse habitats of this area.

Introduction

Farwa Island is one of the most studied Libyan wetlands (Defos du Rau *et al.* 2001). It is situated off the north-western Libyan coast (11°54'45"E, 33°05'08"N), 150km west of Tripoli at the border area between Libya and Tunisia (Figure 1). The island has an elongated sand bar extending from east to west for 11km and which is 0.5–1km wide. This is isolated from the mainland by the lagoon. The opening at the eastern end is blocked by a stretch of sand of about 3km.

The Farwa lagoon covers an area of 1 820ha. Three benthic macrophyte species dominate, namely the marine phanerogams *Cymodocea nodosa*, *Posidonia oceanica* and the alga *Caulerpa prolifera* (Pergent *et al.* 2002), as well as the benthic invertebrate fauna. All these factors play an important and essential role in providing favourable habitats that attract migratory waterbird species.

Methods

Fishing boats were hired to cross the lagoon in order to reach the island and the *Posidonia* accumulation at the far west. A census and observations were conducted by walking along the island with the use of binoculars and field identification books. Callipers were used to measure nests and clutches, following the method adapted by Suhaibany (1995) and Prashant *et al.* (1994).

Results and discussion

During the field survey conducted during 1999, signs of breeding activity of marine birds were observed. Thorough investigations of areas where such activity was observed led to the discovery of nests of the Little Tern (*Sterna albifrons*), with clutch sizes ranging from 1–3 eggs, and also a nest of

the Common Tern (*Sterna hirundo*), with three eggs (Figure 2). In addition to this record, two colonies of this species with various numbers of nests and clutch sizes were observed in June 2001 and May 2004, and these observations support the occurrence of this species as a resident breeder in the area (Table 1). Such species have already been listed as breeding birds on this island (Bundy 1976, Hadoud and Zgouzi 1998).

The Caspian Tern (*Sterna caspia*) has been recorded as a passage visitor in Libya (Bundy 1976) throughout the year. However, a dead nestling was collected during this study on *Posidonia oceanica* seagrass accumulations at the far western section of the island (Figure 3). This is the first record of breeding of this species in Libya.

In addition to these species, aggressive behaviour from Kentish Plover (*Charadrius alexandrinus*), Yellow-legged Gull (*Larus cachinnans*) and Red Shank (*Tringa tetanus*) was encountered during our investigation. This finding is in accordance with previous observations recorded in this region (Hadoud and Zgouzi 1998). In addition, Etayeb (2002) recorded these species to be resident in the area. These findings are consistent with the resident breeding status of these species in the area.

This area is also visited by the Lesser Crested Tern (*Sterna bengalensis*), where 250 birds were counted during May 2004. However, this bird does not nest on this island but is only a passage visitor en route to the breeding ground in the eastern part of Libya, in Gara and the Elba islands (Meininger *et al.* 1994).

Human activities — especially fishing, traffic from fishing boats and tourism — are considered to be major disturbance factors that may have a negative impact on the successful breeding of birds that utilise the diverse habitats of this area.

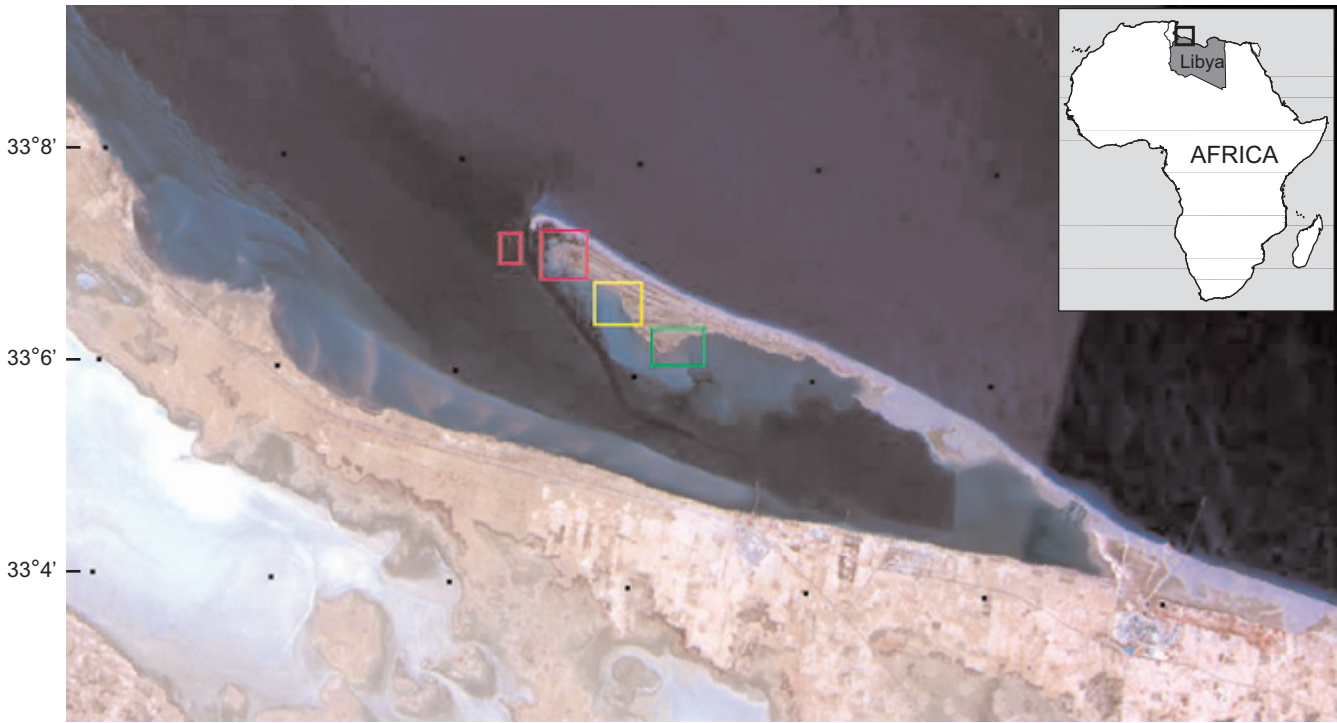


Figure 1: Map of Farwa Island showing the location of the nesting sites



Figure 2: Nests of *Sterna hirundo* on Farwa Island



Figure 3: Dead nestling of *Sterna caspia* on accumulations of *Posidonia*

Table 1: Number of nests and clutch sizes

Date	Species	No. of nests	Clutch size 1	Clutch size 2	Clutch size 3	Length (cm) $\bar{x} \pm SD$	Width (cm) $\bar{x} \pm SD$
May 1999	<i>Sterna albifrons</i>	8	4	2	2	2.84 ± 0.44	2.33 ± 0.27
	<i>Sterna hirundo</i>	1	–	–	1	$1 \pm .20$	3.4 ± 0.25
June 2001	<i>Sterna hirundo</i>	18	6	7	5	4.3 ± 0.29	3.4 ± 0.23
May 2004	<i>Sterna hirundo</i>	10	4	2	4	–	–
Total		37	14	11	12	–	–

Conclusion

This study has revealed the importance of the island as a stopover and refuelling station for marine birds on their route to wintering areas. It also showed the use of the island by some marine birds as a breeding site. These findings necessitate the need for some measures to be implemented in order to reduce the negative impacts that might jeopardise the avian diversity on this island.

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