The breeding avifauna of the Umm al-Qamari Islands protected area, Saudi Arabia

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We carried out eight ornithological surveys of the Umm al-Qamari Islands Protected Area (19°00'N, 41°07'E), located some 20 km south of the coastal city of al-Qunfudah, Saudi Arabia, between January 2001 and July 2003, as part of a breeding seabird study and to monitor any changes in the avifauna of the Protected Area that might have occurred since 1988. A total of 49 bird species was recorded including 11 breeding species. Cattle Egret *Bubulcus ibis*, Western Reef Heron *Egretta gularis*, Striated Heron *Butorides striatus*, Osprey *Pandion haliaetus*, Sooty Gull *Larus hemprichii*, and Graceful Prinia *Prinia gracilis*, recorded as breeding in 1988, we recorded in similar numbers. As in 1988, the Protected Area still holds a spectacular colony of African Collared Dove *Streptopelia roseogrisea* estimated at 950–1300 pairs in May 2002. Sponbill *Platalea leucordia*, Brown Booby *Sula leucogaster*, Lesser Crested Tern *Sterna bengalensis* and Swift Tern *S. bergii* were recorded as new breeding species, the last-named at 380–410 pairs in July 2003 constituting the largest colony reported in the Red Sea region.

Umm al-Qamari, literally 'the mother of doves', is the smallest Protected Area managed by the National Commission for Wildlife Conservation and Development (NCWCD), Riyadh, Saudi Arabia, encompassing less than 0.1 km² of land. Comprising two islands and one sand bank, it has long been known as a spectacular breeding site for African Collared Doves *Streptopelia roseogrisea* (Child & Grainger 1990). The presence of a large congregation of doves during spring and summer on such a small offshore area is almost unique in the region and renders the islands worthy of continued protection. Indeed, the islands have long been protected by traditional hunting laws, a circumstance officially ratified in 1977 by the Saudi Council of Ministers in terms of hunting legislation as a non-hunting area (Child & Grainger 1990); eventually, in 1988 the NCWCD designated it as a Special Nature Reserve, Saudi Arabia's highest level of protection for a protected area (Child & Grainger 1990).

Despite its recognition as an Important Bird Area in the Middle East under bird species assemblage rules (Evans 1994), the Umm al-Qamari Islands Protected Area has received little ornithological attention. A seminal survey was carried out on 20 June 1988 (Symens 1988) followed on 21 February 1993 by a single short-duration visit (Newton *et al.* 1993). Nearly a decade later we carried out eight consecutive visits to the Protected Area between January 2001 and July 2003. We detail here these ornithological observations and assess the changes in the Islands' breeding avifauna between 1988 and 2003.

THE STUDY AREA

The Umm al-Qamari Islands Protected Area is composed of two small, flat (<3m asl), fossil-coral islands, Umm al-Qamari al-Baraniah (5.7 ha), Umm al-Qamari al-Foganiah (1.6 ha) and one sand bank (0.1 ha) located respectively 3.8, 6.4, and 1.8 km off the Saudi Red Sea coast (Fig. 1). The protected area is centred at 19°00'N, 41°07'E, about 20 km south of the coastal city of al-Qunfudah. The two islands and the sand bank are surrounded by a coral shelf whose shallow waters support marine sea-grass (e.g.

Table 1. Bird species recorded in the Umm al-Qamari Isl.	ands Protecte	d Area, with	maximum r	numbers cou	nted during	each survey	: (* = proven	breeding sp	ecies; + = n	ot counted)
Species_Survey Date_	20/06/881	21/02/932	24/01/01	29/04/01	30/09/01	23/12/01	25/05/02	20/10/02	16/07/03	29/07/03
Brown Booby Sula leucogaster*	15	40-50	50-60	65	58	55	70-80	155	125	
White Pelican Pelecanus onocrotalus	+	-	17	2	9	11	2	9	13	24
(Northern) Shoveler Anas clypeata					-					
Striated Heron Butorides striatus*	2		-	7	-	7	-	-	-	-
Cattle Egret Bubulcus ibis*	155			60-70			120		85	95
Western Reef Heron Egretta gularis*	18		-	2			9	2	16	14
(Eurasian) Spoonbill Platalea leucorodia*		36		19			2		9	
Black Kite Milvus migrans				-						
Marsh Harrier Circus aeruginosus		-								
Montagu's Harrier Circus pygargus				-						
Osprey Pandion haliaetus*	5	2	4	2	ო	2	-	2	2	2
(Eurasian) Oystercatcher Haematopus ostralegus					-					
Crab Plover Dromas ardeola								ი		
Ringed Plover Charadrius hiaticula								4		
Kentish Plover Charadrius alexandrinus		2	2	2	2	2	2	ი	-	
Lesser Sand Plover Charadrius mongolus								2		
Sanderling Calidris alba		2	4			c		4		
Little Stint Calidris minuta					-	-		2		
Dunlin Calidris alpina								2		
(Common) Redshank Tringa totanus		2	4			-				
(Common) Greenshank Tringa nebularia			-							
(Ruddy) Turnstone Arenaria interpres		9	2	9	28	22	6	9	2	
Sooty Gull Larus hemprichii*	>500	100	180	45	30-40	170	180	35	235	280
White-eyed Gull Larus leucophthalmus		~	8-10	ი						
Great Black-headed Gull Larus ichthyaetus			9							
Yellow-legged (Caspian) Gull Larus cachinnans			45			30-40				
Armenian Gull Larus armenicus			4							
Caspian Tern Sterna caspia	+		2	2				2	-	
Swift Tern Sterna bergii*	+	+		10–20	16	10	300-400	42	550-600	320
Lesser Crested Tern Sterna bengalensis*	+	+	-	20–30	8	40-50	10–20	24	>650	>650
White-cheeked Tern Sterna repressa	+	+						-		
Bridled Tern Sterna anaethetus									0	0
Saunders's Tern Sterna saundersi			-						7	
Common Noddy Anous stolidus				-						

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African Collared Dove Stre	eptopelia roseogris	sea*	600-800	>500?	3<	50	2	900–1300		100–150	+
Hoopoe Upupa epops									, -		
Sand Martin Riparia riparia						2	0-40				
Barn Swallow Hirundo rust	tica						6	2	ę		
Yellow Wagtail Motacilla fl	ava						10				
Isabelline Wheatear Oenar	nthe isabellina						2				
Northern Wheatear Oenan	ithe oenanthe					_					
Mourning Wheatear Oenal	nthe lugens			-							
Graceful Prinia Prinia grac.	ilis*		+	+	+	+	+	+	+	+	+
African Reed Warbler Acro	ocephalus baeticat	tus				_					
Spotted Flycatcher Muscic	apa striata						2				
Golden Oriole Oriolus oriol	lus						-				
Isabelline Shrike Lanius is	abellinus								2		
Brown-necked Raven Con	vus ruficollis		9	2		-		1			
Notes: 1 Symens (1988) (did not visit the sa	nd hank.									
2 Newton <i>et al.</i> (15	993) visited only U	Imm al-Qama	ri al-Barania	lh Island.							
Table 2. Number of incubs between January 2001 and	ated nests and chi d July 2003	cks of Brown	Booby Sula	leucogaster r	ecorded on th	e three isla	inds of Umm al-0	λamari Islands I	Protected A	rea during eiç	tht surveys
	Sand ba Nests	ank s	-	Umm al-Qami Ne	ari al-Fogania ests	ų	Umm al-Qar N	nari al-Barania lests	Ę		
Survey date	with eaa(s)	with chick		with eaa(s)	with chic	J	with ead(s)	with chick	J	To	tals
24/01/01	0	0		0	ო		0	0		1	ę
29/04/01	4	0		0	0		0	0			4
30/09/01	0	12		2	14		2	0			30
23/12/01	0	0		-	6*		0	-			œ
25/05/02	20	0		-	0		0	0			21
20/10/02	0	ო		25	10		0	0			38
16/07/03	9	19		9	-		0	0			32
29/07/03	10	24		27	-		4	0			66
Totals	40	58		62	35		9	-			202
	-										
"One nest with one chick a	and one egg										

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Posidonia sp.). Protruding coral reefs offer roosting sites to a number of bird species. On Umm al-Qamari al-Baraniah and Umm al-Qamari al-Foganiah, the vegetation community essentially comprises dew-dependent *Salvadora persica, Suaeda fructicosa,* and *Suaeda* sp. forming dense thickets up to 3 m tall (less on Umm al-Qamari al-Foganiah) towards the edges of the vegetated areas and shorter in the middle of the islands. The littorals of both islands consist of coral sand beaches possessing above the intertidal zone isolated clumps of *Cyperus conglomeratus, Atriplex farinosa,* and *Zygophyllum album* (Alwelaie *et al.* 1993). The sand bank has no vegetation. There are no weather records for Umm al-Qamari Islands Protected Area, but we have assumed that weather data pertaining to al-Qunfudah applies, giving a mean ambient temperature range of 26 to 33°C throughout the year and a mean relative humidity range of 65 to 85%, increasing at night, possibly reaching 100% (Al-Jerash 1989). As in the southern Red Sea, rain is unpredictable, rarely exceeding 40 mm annually in al-Qunfudah (Alwelaie *et al.* 1993). Between September 2001 and July 2003 we recorded less than 2 mm of rain in Umm al-Qamari al-Baraniah.

METHODS

The Protected Area was visited on eight occasions, on 24 January 2001, 29 April 2001, 30 September 2001, 23 December 2001, 25 May 2002, 20 October 2002, 16 July 2003, and 29 July 2003. Birds were observed on foot or from a boat throughout the study area, from sunrise to late morning during each survey and were identified by reference to the standard ornithological literature. Observations of eggs or chicks observations were taken as proof of breeding. In May 2002 and July 2003 we estimated nest density within the African Collared Dove and tern colonies by counting nests within a number of 2x2 m or 1x1 m squares placed evenly throughout the colonies. We then determined the nest totals per colony by measuring either the surface of the potential breeding area for doves (dense *Suadae* sp. and *Salvadora persica* habitat) or the occupied area for terns.

We used Garmin III GPS; its 'TrackBack' navigation feature enabled us to retrace any path that defined breeding colonies. We stored locations at 1m intervals, enabling us to map accurately perimeters and surfaces using ArcView 3.2. We used callipers (+/-0.1 mm) to measure the dimensions of sampled eggs and an electronic portable scale (+/-0.1 g) to determine weights.

RESULTS AND DISCUSSION

Brown Booby Sula leucogaster

The species was found breeding during all eight visits to the Protected Area. Between January 2001 and July 2003 a total of 108 incubated nests and 94 chicks were recorded (Table 2) (Plates 1–2–3). Clutch size was generally two (67.6%; n = 73), less frequently one (31.5%; n = 34) and in one case three (0.9%). We never observed more than one chick reared by parents, but on one occasion we recorded a clutch with one egg and one hatched chick confirming asynchronous hatching (Cramp & Simmons 1977). All but two nests were located on the coral sand beaches, above the intertidal zone, either without vegetation protection or at the edge of clumps of Cyperus conglomeratus sedges. Nests were shallow depressions in coral sand sometimes being lined with twigs, dry algae, debris and flotsam (Plate 4). Two pairs had laid and incubated an egg in an old Osprey (*Pandion haliaetus*) nest built from branches of Salvadora persica, in clumps of *Atriplex farinosa*. Eggs were oval, pale blue with a chalky white coating (Plate 5) and measured 41.3-66.1 mm by 37.0-43.6 mm (average = $58.7 \times 41.1 \text{ mm}$; SD = 3.9x1.3; n = 56) and weighed 40.2-55.9 g (average = 49.1 g; SD = 5.3; n = 14), similar in size and mass to those at Ascension Island (59x40 mm, 39–65 g; Stonehouse 1963). Although our observations suggest that the species is a year-round breeder in the

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Plate 1. Brown Booby *Sula leucogaster* on nest, Umm al-Qamari al-Foganiah Island, Saudi Arabia, 20 October 2002. (*Eric Bedin*)



Plate 3. Brown Booby *Sula leucogaster* about to fledge (i.e. 90–100 days), Umm al-Qamari al-Foganiah Island, Saudi Arabia, 20 October 2002. (*Stéphane Ostrowski*)



Plate 2. One-day-old Brown Booby Sula leucogaster chick, Umm al-Qamari al-Foganiah Island, Saudi Arabia, 23 December 2001. (Stéphane Ostrowski)



Plate 4. Nest of Brown Booby *Sula leucogaster*, Umm al-Qamari al-Foganiah Island, Saudi Arabia, 29 April 2001. (*Stéphane Ostrowski*)



Plate 5. Comparative sizes of Brown Booby *Sula leucogaster* (left), Swift Tern *Sterna bergii* (middle), and Lesser Crested Tern *Sterna bengalensis* (right) eggs, Umm al-Qamari sand bank, Saudi Arabia, 29 July 2003. (*Stéphane Ostrowski*)



Plate 6. Breeding Cattle Egrets *Bubulcus ibis*, Umm al-Qamari al-Baraniah Island, Saudi Arabia, 25 May 2002. (*Eric Bedin*)

Protected Area, Symens (1988) did not record the species in June 1988 and Newton *et al.* (1993) found no signs of breeding but observed five individuals flying amongst the Sooty Gull flock over Umm al-Qamari al-Baraniah Island. Although Newton *et al.* (1993) limited their visit to Umm al-Qamari al-Baraniah Island where we noticed throughout our surveys fewer breeding pairs than on other islands (Table 2), their recorded lack of breeding pairs suggests that the Brown Booby may be a relatively recent breeding species in the Protected Area.

Striated Heron *Butorides striatus*

On 25 May 2002 we recorded an almost-fledged chick hiding in an *Atriplex farinosa* clump bordering the intertidal zone. The species appears resident in the Protected Area, a maximum of 2–3 pairs breeding (Symens 1988).

Cattle Egret Bubulcus ibis

On 29 April 2001, there were 45–50 birds in breeding plumage roosting on the tallest *Salvadora persica* and *Suaeda* sp. thickets in south-east Umm al-Qamari al-Foganiah but we could not confirm breeding. On 25 May 2002 we found about 90 birds in breeding plumage and two nests (with one and two eggs respectively in these dense *Salvadora persica* and *Suaeda* sp. thickets in south-east Umm al-Qamari al-Baraniah (Plate 6). Probably there were more incubating nests, but we limited our investigations to minimize disturbance. On 16 and 29 July 2003 there were 25 and 45 juveniles respectively, close to fledging, and about 65 adults. Adults flew frequently to the mainland, never being seen foraging around the island. The number of breeding pairs was comparable in 2001–2003 to 1988 (Symens 1988). Presumably, the species is a regular breeder from May to June on Umm al-Qamari al-Baraniah Island.

Western Reef Heron Egretta gularis

Concomitant to our Cattle Egret observations, we recorded up to six adult Western Reef Herons in the Cattle Egret heronry on Umm al-Qamari al-Baraniah where by 16 July 2003 five juveniles were close to fledging. Two weeks later there were seven newly-fledged birds amongst eight adults foraging on the island's beaches and coral reefs. Symens (1988) had reported a similar number of breeding pairs. This species also appears to be a regular summer breeder in the Protected Area, deserting the islands during autumn and winter.

(Eurasian) Spoonbill Platalea leucorodia archeri

On 29 April 2001, 19 adults in fresh breeding plumage were roosting with Cattle Egrets on the tallest Salvadora persica and Suaeda sp. thickets in south-east Umm al-Qamari al-Foganiah and on 25 May 2002 two birds in breeding plumage were present in the Cattle Egret colony on Umm al-Qamari al-Baraniah but we were unable to confirm breeding. Eventually, on 16 July 2003 we found one nest with two chicks (Plate 7) in the Umm al-Qamari al-Baraniah heronry; there was also an adult and a newly-fledged juvenile foraging on the beach. We also recorded the species foraging around the islands in winter. The species' breeding period and the extent to which it species uses the Protected Area as a regular breeding site are unclear. On 21 February 1993, 36 adults in breeding plumage were present, and possibly about to breed on Umm al-Qamari al-Baraniah (Newton et al. 1993). On 29 April 2001, 28 nests containing almost-fledged chicks were recorded on as-Seqalah Island located about 15 km north of the Umm al-Qamari Islands Protected Area (PERSGA/GEF 2003), none then being located in the Protected Area itself. Unfledged birds were still present on 29 July 2003. The species is possibly an irregular breeder in the Protected Area between March and June.

Osprey Pandion haliaetus

Three nests were recorded on Umm al-Qamari al-Baraniah and two on Umm al-Qamari al-Foganiah, all but one being sited on the ground at the islands' periphery of the islands and being constructed of flotsam and *Salvadora persica* branches. The nest previously described by Symens (1988) is right in the middle of Umm al-Qamari al-Baraniah, comprising a 1.5m pile of *Salvadora persica* branches. On 24 January 2001 a nest on the northern Umm al-Qamari al-Baraniah coastline had three eggs (Plate 8). Another pair was roosting on a nest on Umm al-Qamari al-Foganiah. Some two months later the former nest held an unfledged chick (Shobrak, pers. comm.). A maximum of two pairs appears to breed during winter on the Umm al-Qamari Islands.

Sooty Gull Larus hemprichii

We recorded the species regularly in the Protected Area, numbers ranging from 45 to 280 (Table 1). On 23 December 2001 we found a carcase of a one to two-week-old chick below a *Suaeda* sp. bush on Umm al-Qamari al-Baraniah, proof of breeding. On 25 May 2002 we observed many adults in bright breeding plumage, but our search of all the *Cyperaceae* vegetation clumps failed to find any nests where Symens (1988) had recorded several on 20 June 1988. However, on 16 July 2003, on beaches on Umm al-Qamari al-Foganiah and Umm al-Qamari al-Baraniah we found two and four downy chicks respectively. Despite Symens' (1988) estimate of 50–100 pairs breeding in the Protected Area, our records of over 200 adults in July 2003 are not yet augmented by accurate numbers of breeders. The species appears to be a regular summer breeder in the Protected Area.

Swift Tern Sterna bergii velox

We recorded the species in the Protected Area throughout the year. On 30 September 2001, there were 13 decomposed carcasses of almost- or newly-fledged juveniles on the sand bank. On 25 May 2002 the breeding colony of about 270 pairs (6–7 nests/m² on an area of 42 m²) was located on the west-centre of the sand bank (Plate 9). On 16 July 2003 that colony comprised three crèches of 299 chicks of varying age on mudflats adjoining the sand bank; 80–110 adults were still incubating. By 29 July 2003 there were 140–150 unfledged chicks in two crèches and 60–70 adults still incubating. The proportion of incubating adults that had started head feather moult had increased from 9% to 53% between the two visits. Eggs were sub-elliptical, buff-cream, blotched and speckled black and dark brown (Plate 5), measuring 58.5–66.5mm x 42.5–44.2 mm (average = 63.0x43.2 mm; n = 9) and weighing 50.7–60.9 g (average = 54.1 g; SD = 3.9; n = 14). We estimated the colony at 380 to 410 breeding pairs in 2003. Although the Swift Tern is recorded breeding in the region (Cramp and Simmons 1985), this newly recorded colony on the Umm al-Qamari Islands is the largest described so far in the Red Sea region (Jennings, 1995; PERSGA/GEF 2003).

Lesser Crested Tern Sterna bengalensis

Like the above species, it was observed throughout the year. On 25 May 2002 the Swift Tern colony had only one *S. bengalensis* that possibly was breeding, but by 16 July 2003 there were an estimated 420 birds breeding in association with the Swift Terns at an average density of 9.5–10.5 nests/m2 on a 41 m² area (Plate 10). In addition 148 chicks of different ages had assembled in two crèches. Two weeks later there were 280–320 chicks in crèches and 210–260 birds still incubating. The proportion of incubating adults that had started head feather moult did not vary between the two visits (14–16%). Eggs were sub-elliptical, buff-cream, blotched and spotted black (Plate 5), measured 49.0–52.4 mm x 33.0–36.7 mm (average = 51.3x35.3 mm; n = 10) and weighed 25.9–34.1 g (average = 26.8 g; SD = 2.6; n = 10). At least 550 to 600 pairs of Lesser



Plate 7. Two Spoonbill chicks *Platalea leucorodia archeri*, Umm al-Qamari al-Baraniah Island, Saudi Arabia, 16 July 2003. (*Eric Bedin*)



Plate 9. Swift Tern Sterna bergii velox colony, Umm al-Qamari sand bank, Saudi Arabia, 25 May 2002. (Eric Bedin)



Plate 11. Young African Collared Dove Streptopelia roseogrisea, Umm al-Qamari al-Baraniah Island, Saudi Arabia, 29 April 2001. (Stéphane Ostrowski)



Plate 8. Osprey Pandion haliaetus nest and clutch Umm al-Qamari al-Baraniah Island, Saudi Arabia, 24 January 2001. (*Eric Bedin*)



Plate 10. Mixed colony of Swift Terns Sterna bergii velox and Lesser Crested Terns Sterna bengalensis, Umm al-Qamari sand bank, Saudi Arabia, 29 July 2003. (Stéphane Ostrowski)



Plate 12. Nest and clutch of African Collared Dove *Streptopelia roseogrisea*, Umm al-Qamari al-Baraniah Island, Saudi Arabia, 29 April 2001. (*Stéphane Ostrowski*

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Crested Terns bred in the Protected Area in 2003 in association with Swift Terns. Symens (1988) had speculated that because Sooty Gull is a predator of broods of other gulls and terns, it may have prevented other seabirds from breeding on the islands he had visited. Now although he did not record breeding terns in June 1988, he had not surveyed the sand bank. Newton *et al.* (1993) had visited the area during February when they were unlikely to record breeding terns. In 2003 we observed that Sooty Gulls took unguarded eggs and newly hatched chicks at the mixed colony's periphery.

African Collared Dove Streptopelia roseogrisea

We recorded this species breeding in large numbers on Umm al-Qamari al-Baraniah in April 2001, May 2002 and July 2003. Nests, eggs, chicks and recently fledged juveniles all were present during these visits (Plate 11). Nests were frail twig structures, 0.3-1.8 m above ground in Salvadora persica bushes (Plate 12). Eggs were pure white, one to two per clutch. Because the species uses widespread very dense habitat that allows poor sightlines to observers, it proved difficult to assess absolute number of birds present in the colony (Newton et al. 1993). On 20 June 1988 Symens (1988) estimated the total number of African Collared Doves to be between 600 and 800 birds. On 21 February 1993, Newton et al. (1993) estimated that more than 500 birds could have been present during their visit and mentioned that after 1600 hours, additional flocks of birds arrived on the island from the mainland. In May 2002 we calculated that the area of dense Salvadora/Suaeda thickets used by breeders on Umm al-Qamari al-Baraniah stretched over c. 9,550 m². Applying measured density samples of 0.10-0.14 active nests/m² to this area suggests that these thickets house up to 1350 nests during May. This is a conservative estimate, for we did not include known and likely areas of higher densities, nor the 12–17,000 m² of low *Suaeda* sp. vegetation in the middle of the island where the species breeds, but probably at lower densities. We lack data on its population dynamics and its migration patterns from 1988 onwards and so offer no explanation for its gregarious breeding on the islands. It appears to reach the Protected Area in February (Newton *et al.* 1993), numbers building up until May–June, and then its population size decreases until it deserts the breeding site in October. However we note that from 2001 to 2003 the species did not breed in the Salvadora / Suaeda thickets of Umm al-Qamari al-Foganiah, only 2.4 km from Umm al-Qamari al-Baraniah, although it had been reported breeding on both in June 1988 (Symens 1988). (Newton *et al* (1993) did not visit Umm al-Qamari al-Foganiah in 1993).

Graceful Prinia Prinia gracilis

This species is the only Passeriforme to have been recorded as breeding in the Protected Area. It is very common, individuals singing during each of our visits. We found one nest and a recently fledged juvenile in a *Suaeda* sp. bush in January 2001, indicating winter breeding. The species is resident in the Protected Area.

CONCLUSION

The Umm al-Qamari Islands Protected Area appears to be a relatively undisturbed birdlife sanctuary on the Saudi Red Sea coast. Although we found evidence of African Collared Dove being hunted and having their eggs collected and of indirect disturbance by picnickers and fishermen, such events seemed marginal and irregular. That ground-nesting species and the African Collared Dove (which often nests low down) breed so successfully implies that ground predators, such as rat, cat and fox spp., thankfully are absent. The Protected Area thoroughly deserves its listing as an Important Bird Area in the Middle East not only for its seabird colonies but also for its spectacular concentration of African Collared Doves.



Fig 1. Map of Umm Al-Qamar Islands Protected Area

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