

Nesting parameters of Turtle Doves

Streptopelia turtur arenicola breeding in Bahrain

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The Turtle Dove *Streptopelia turtur arenicola* (E Hartert, 1894) breeds from Morocco east to Tripoli, and from Iraq and Iran east through Afghanistan, Turkestan and Khirgiz steppes to northwest China (del Hoyo *et al* 1997). Within the Arabian peninsula it has been recorded breeding in Kuwait, Saudi Arabia, United Arab Emirates, Oman and Yemen in addition to Bahrain. It has not been recorded breeding in Qatar though suitable habitat exists there (Jennings 2010). Turtle Doves are widespread and common migrants throughout Arabia. They are thought to spend the winter in the Sahel and Ethiopia, returning north March–May to breed. Post breeding movements occur July–October and there is no evidence of wintering in Arabia (del Hoyo *et al* 1997, Beaman & Madge 1998, Jennings 2010).

The earliest record of breeding in Bahrain dates back to 1969, with additional records from 1982, 1985 and 1993 (Nightingale & Hill 1993). The largest estimate was of 30 nests in Al Areen wildlife park in July 1985 (Nightingale & Hill 1993). The colony monitored in the current study is immediately south of Al Areen wildlife park, in a group of mature desert broom *Leptadenia pyrotechnica* bushes, and may be the only Turtle Dove colony in Bahrain. Anecdotal evidence suggests that this breeding colony has been present annually for several decades at least, though recent evidence of birds breeding within the park was not available.

The aims of the study were to gather information on the breeding parameters of this Turtle Dove colony, to estimate colony size and to conduct ringing of the chicks in the hope of getting recoveries to elucidate movement patterns of these Bahrain birds.

STUDY AREA

The Turtle Dove colony (10–20 m asl, 25° 58' 27" N, 50° 31' 13" E, Plate 1) occurs in a series of sandy wadis 3 km from the western sea shore and 1.5 km directly south of Al Areen wildlife park. The wadis are dominated by desert broom bushes which can grow to a maximum height of 3 m (Phillips 1988). Most of the bushes, however, are less than 2 m due to regular grazing by domestic camels from a nearby farm. The area surveyed was



Plate 1. Wadi containing desert broom bushes used by nesting Turtle Doves *Streptopelia turtur*, part of the Bahrain colony studied in the present paper, 27 May 2011. © Brendan Kavanagh



Plate 2. Turtle Dove *Streptopelia turtur* almost fledged, Bahrain, 1 June 2010. Note droppings in nest. © Brendan Kavanagh



Plate 3. Young Turtle Doves *Streptopelia turtur* waiting to be ringed, Bahrain, 27 May 2011. © Brendan Kavanagh

c1.4 km² (1400 ha) with several sandy wadis interspersed between rocky desert devoid of vegetation. The terrain slopes gently towards the west. While no information was available on the feeding habits of the birds, it is thought that they were obtaining food from the animal pens in the wildlife park.

MATERIALS AND METHODS

The study area was visited nine times 27 May–30 July 2011. All visits occurred during the late afternoon (after 16.00 h) when the heat was less intense. Each visit lasted 1.5–2.0 h. As the area was large, it was not possible to survey it completely each visit so different portions of the site were selected each time. All bushes within the wadis were searched individually on foot. A label was placed in the sand beneath each nest to allow individual identification of nests. The contents of the nest were recorded on each occasion, noting all empty nests and any evidence of droppings that indicated the previous presence of squabs (Plate 2). Nests continued to be monitored throughout the study period to ascertain if any re-nesting occurred within the same nest. Once chicks reached c7 days old, they were ringed under license with a British Trust for Ornithology (BTO) ring. Permission to use BTO rings in Bahrain was granted by the Bahrain government agency, the Public Commission for the Protection of Marine Resources, Environment and Wildlife.

Laying, hatching and fledging date were estimated using 13 days for incubation and 19 days for brood rearing (Cramp 1985, del Hoyo *et al* 1997). Ages of chicks were estimated as 2, 4, 7, 10 or 15 days depending on size and feather growth stages based on prior ringing experience of chicks at the same site in 2009 and 2010 (Plates 3 & 4).

RESULTS AND DISCUSSION

In total 54 nests were monitored over 65 days, 27 May–30 July 2011. Nine visits were undertaken, producing an average of 2.8 records per nest (range 1–6, Figure 1). Early nests

tended to have a higher number of records as the increasing summer temperatures made later visits to the site shorter.

Breeding began before the monitoring period and the fledging period extended beyond the last visit. Assuming 13 days incubation and 19 days chick rearing, the earliest calculated incubation date was 25 April and the latest fledging date was 11 August. Thus the breeding season was estimated to span 109 days in 2011. The minimum number of active nests, estimated from the data from each visit to the colony, ranged from 13 on 25 June to four on 30 July (Figure 2). The largest number of active nests was recorded in June with declining numbers through July.

A summary of the breeding performance of the Turtle Doves is shown in Table 1. Of the 54 nests observed, one was empty throughout the recording period while 12 others were only visited once. No analysis was possible from these nests. Of the remainder, 18 failed to produce young, 17 fledged at least one young and 6 further nests showed evidence of droppings corresponding to some young having at least hatched or possibly fledged. Based on nests of known outcome, 48.6% ($n = 17$) of nests were successful and 51.4% ($n = 18$) unsuccessful to fledging.

Of the 33 nests which had eggs when first recorded, four had one egg (12%), 28 had two eggs (85%) and one had three eggs (3%), yielding an average clutch size of 1.97 eggs per nest ($n = 33$). Twenty-nine chicks were fledged from 17 successful nests, 12 of these fledged two chicks while five nests fledged one chick, yielding an average fledging success of 1.7 fledglings/successful nest.

The conservatively estimated breeding season of 109 days, 25 April–11 August, corresponds well with other records from the Gulf region where eggs have been noted from 26 April and a few recorded in July (Jennings 2010). The presence of eggs on 18 July in Bahrain, which subsequently hatched and fledged chicks, provides evidence of breeding continuing through July into the first half of August in that population. This breeding season is earlier than in southern Europe but similar to that observed in North Africa by Heim de Balsac and Mayaud in the early 1960s (Cramp 1985).

It is difficult to ascertain the size of the breeding colony/population from the data provided. The maximum confirmed number of breeding pairs at any one time was 13 on 25 June. However if one assumes that all nests with eggs were occupied at that point, then the number of pairs was 19. No evidence of second broods could be discerned from our data (Figure 2) though other studies confirm that the Turtle Dove is at least double brooded throughout its range (Cramp 1985, Jennings 2010). Given that the vast majority of nests were not reused for second breeding attempts in Bahrain, the 54 nests would plausibly have been produced by 20–25 pairs of doves (allowing for two breeding attempts and additional replacement nests after failed attempts). This number is in line with an estimate in 2010 based on a single visit to the colony on 5 June when an estimated 24 nests were occupied (www.hawar-islands.com/blog/gen_stub.php/2010/06/).

The failure of 51.4% of nests, whose outcome was known, can be attributed to several factors. Camels were known to feed on the broom bushes on several occasion during the breeding season. Grazing of the bushes caused displacement of nests and eggs though



Plate 4. Young Turtle Dove *Streptopelia turtur* being ringed, Bahrain, 27 May 2011. © Brendan Kavanagh

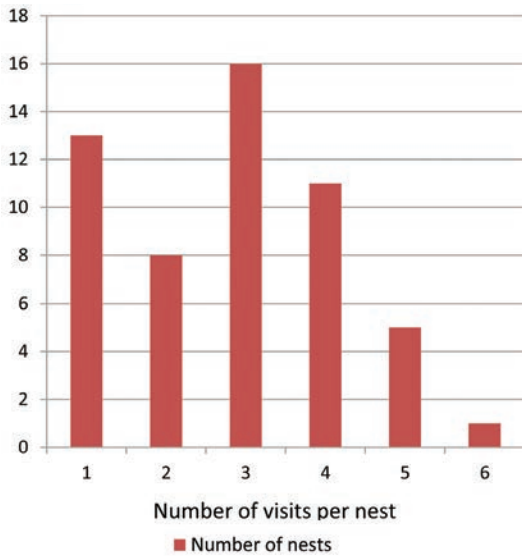


Figure 1. Number of visits to each of 54 Turtle Dove *Streptopelia turtur* nests in Bahrain, 2011.

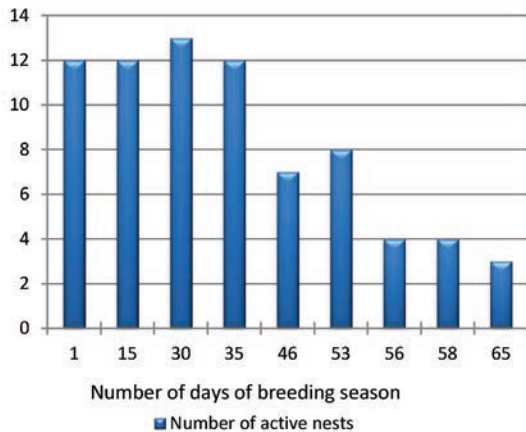


Figure 2. The number of active nests observed during the Turtle Dove *Streptopelia turtur* breeding season, Bahrain 2011. Day 1 = 27 May, Day 35 = 30 June, Day 65 = 30 July.

Table 1. The outcome of 54 nesting attempts of the Turtle Dove *Streptopelia turtur* recorded breeding in Bahrain, 2011.

Breeding Outcome	Number of nests
Empty nest	1
Unknown	12
Possible success	6
Failed	18
Successful	17
Total nests monitored	54

older chicks appear to be able to withstand the disturbance. Sporadic shooting of adults was also in evidence from a number of fresh, empty, shotgun shells observed on one occasion. This was also in evidence in previous years. Disturbance at the nest due to the observers could also be a factor causing nest failure though it was not possible to quantify this in this study. The nesting success rate of 48.6% of nesting attempts from our data represents minimal figures as other nests showed evidence of having had fledglings present prior to recording.

The recorded clutch size of 1.97 eggs/nest is in line with observations from other populations (Cramp 1985), as is the fledging success of 1.7 fledglings/successful nest. If one assumes a similar performance in the category of 'unknown' nests (12) in the study area then the total chick production in 2011 was in the order of 49 birds from the estimated 20–25 pairs. A more systematically timed approach to the field work would have been required to verify these figures.

Turtle Dove behaviour at the nest

Based on the distribution of nests, turtle doves appeared to be territorial within the wadis. Occupied nests were spaced at least 50 m apart, only one nest per bush. No successful nest was reused for a second breeding attempt. Nests were placed 1.5–2.0 m above the ground and all were reachable without a ladder. They were placed inside the bushes in their upper half. Full grown chicks usually fled the nest, diving into the centre of the bush, when approached. Younger chicks showed no such behaviour and were easily removed from the nest for ringing and replacement only to sit quietly again.

Nests were constructed from dead twigs collected from the broom bushes. No artificial materials were incorporated into the structure which was flat and open. Eggs could be easily seen through the loose weave of dead twigs (Plate 5).

During the survey visits the behaviour of adult birds was noted. Incubating birds sat tight on the nest until our presence

was within a few metres of the nest. On many occasions the birds allowed approach to within 1 or 2 m before escaping. On one occasion the adult bird was caught on the nest and ringed. On leaving the nest, birds invariably flew 50–100 m away and dropped to the ground feigning injury. This involved lying on its belly and flapping one or sometimes, both wings as if they were broken. This was usually conducted on the bare stony desert within view. The behaviour would normally last less than a minute and no attempt was ever made to approach the nest again while we were present. This distraction-lure display has been observed by several authors in previous studies (Cramp 1985).



Plate 5. Turtle Dove *Streptopelia turtur* nest with eggs, Bahrain, 1 June 2010. © Brendan Kavanagh

Young chicks up to 4 or 5 days old were normally brooded and the adult birds appeared to incubate them. Older chicks were usually alone in the nest or the adult birds had escaped while we were still over 50 m away. Adult birds were normally seen singly rather than in pairs and fledged young were frequently observed together in the sand beneath the nest bush thus remaining close to the nest for some days after fledging.

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