

Short Communication

A Note on the Breeding of the Great Bustard *Otis tarda* on Sootav Plain, Boukan, Northwestern Iran

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Abstract: The breeding activities of the Great Bustard *Otis tarda* were studied on the Sootav plain in its main breeding ground in north-western Iran. Of five nests, the first and the last nests were discovered on 7 May with 3 eggs and on 20 May with 2 eggs, respectively. Mean clutch size was 2.8 ± 0.44 and the mean distance to the nearest village and road were 2460 ± 896.1 and 2615.2 ± 1284 m, respectively. Observations showed that the mean distance of each nest to the nearest nest was also 1334 ± 856.6 m. The breeding population of the Great Bustard on the Sootav plain has declined compared to previous years because of a reduction in the quality of its breeding habitat.

Introduction

The Great Bustard *Otis tarda* occurs in highly fragmented populations across the Palaearctic region, from the Iberian Peninsula and Morocco, eastwards to China (del Hoyo *et al.* 1996, Alonso *et al.* 2000, 2003). Currently, it is considered Globally Threatened and qualifies as Vulnerable in the Red List of Threatened Species (IUCN 2008, Birdlife International 2008). In Iran, this species occurs in West and East Azarbaijan, Kurdistan, Hamedan and Kermanshah provinces that are located in the northwest and west of the country (Amini 2000). Habitat destruction and hunting caused a sharp decline in the Great Bustard population in Iran in recent decades and this species has disappeared from the majority of its previous distribution ranges (Amini 2000, Barati & Amerifar 2008). However, areas of Boukan, West Azarbaijan, represent the most important habitat for the Great Bustards in Iran.

According to observations in past decades, this habitat used to support large populations of the species which has declined to a current small number of 30–40 individuals (13 breeding pairs in April 2009 and 35 individuals wintering in January 2009) - mainly due to hunting and habitat destruction. Recent observations suggested that the plains of Boukan are the breeding ground of Great Bustards where the species nests in remote cultivated areas subjected to little disturbance (Abdulkarimi *et al.* 2010).

Study Area

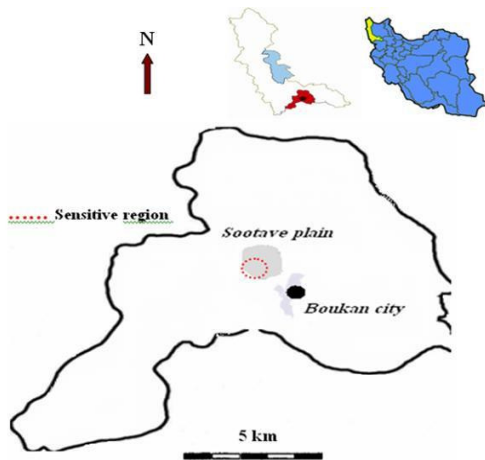
The Sootav plain is the main breeding ground for the Great Bustard in the Boukan area and has the highest breeding population in the Boukan area (Abdulkarimi *et al.* 2010, Abdulkarimi 2010). We monitored the breeding activities of this species on the Sootav plain of Boukan from early March to late June 2009. This area is located at a distance of four km to the northwest of Boukan ($36^{\circ}33' - 36^{\circ}37'N$ and $46^{\circ}08' - 46^{\circ}12'E$) in Mokryan region, south of West Azarbaijan Province covering an area of about 44 square km with an elevation of 1,410 m a.s.l. (Fig. 1). Sootav is entirely cultivated with cereals (mainly Wheat *Triticum aestivum* and Barley *Hordeum vulgare* and legumes (e.g. Chick-Pea *Cicer arietinum* and Lentil *Lens culinaris*) (Abdulkarimi *et al.* 2010). Some parts of the area are designated as an environmentally sensitive region which contains 10–15 sq km located in the centre and south of the plain (Fig. 1).

Table 1. Maximum number and sex-ratio of the Great Bustard on Sootav plain during 2009 breeding season.

Month	Males	Females	Total	Sex Ratio (M/F)
March	6	8	14	0.75
April	7	19	26	0.36
May	7	13	20	0.53
June	3	8	11	0.37

Table 2. Characteristics of the nests of the Great Bustard on Sootav plain of Boukan in 2009.

Parameter	Nest 1	Nest 2	Nest 3	Nest 4	Nest 5
Coordinates	36°34'45"N, 46°09'47"E	36°34'45"N, 46°10'79"E	36°34'68"N, 46°10'57"E	36°34'45"N, 46°08'09"E	36°34'23"N, 46°08'32"E
Altitude (m a.s.l.)	1412	1377	1382	1423	1389
Plant cover at nest site	Leguminae (pea)	Grass (wheat)	Grass (wheat)	Grass (wheat)	Grass (wheat)
First visit	late May	early May	early May	early May	early May
Second visit	late June	middle June	middle June	middle June	middle June
Clutch Size	2	3	3	3	3
Distance to main road (m)	876	3400	3600	1700	3500
Distance to village (m)	900	2500	3000	2900	3000
Distance to nearest nest (m)	2600	535	535	1500	1500

**Figure 1.** Location of Sootav plain in North-western Iran.**Figure 2.** Female Great bustard at nest site, Sootav plain, May 2009 © M. Ahmadi.

Results

Observations of Great Bustards during the breeding season of 2009 are presented in Table 1. On the Sootav plain, courtship behaviour began in late March and lekking occurred in mid and late April. Female bustards disappear for egg-laying in grasslands in late April and early May (Authors' observations). The first nest was discovered on 7 May with 3 eggs, located in non-irrigated wheat (Fig. 2). The characteristics of the nests are presented in Table 2. The mean clutch size of five nests was 2.8 ± 0.44 (median: 3). The mean distance to the nearest village and the main road (of Boukan-Mahabad) was 2460 ± 896.1 m ($N=5$) and 2615.2 ± 1284 m ($N=5$), respectively. Observations showed that the mean distance of each nest to the nearest nest was 1334 ± 856.6 m (median: 1500) ($N=5$) (Table 2). We found four nests in grasslands (wheat) and one in the legume (chick-pea) fields. Observations indicated that during the incubation period the female bustard left the nest for feeding about 1–2 hours per day. All four nests situated in wheat fields hatched successfully, while the single nest with clutch size 2 situated in chick-pea fields was abandoned (Fig. 3).



Figure 3. Great Bustard nest in Chick-pea field, Sootav plain, June 2009 © M. Ahmadi.

Discussion

Although the maximum number of 7 males and 19 females in April 2009 increased compared with 5 males and 14 females in April 2008 (Abdulkarimi *et al.* 2010), the breeding population of the Great Bustard in areas of Boukan especially on Sootav plain has declined in recent decades (Amini 2000, Abdulkarimi *et al.* 2010).

Some factors are important during the breeding season of this species which may reduce habitat quality. Some affective factors are human disturbance through harvesting crops, grazing sheep, farmers' activities, and occurrence of animals such as domestic dogs, wolves, foxes and jackals. It seems that advanced irrigated agroecosystems are the main cause of population loss in these areas, especially in the breeding season, which results in habitat destruction and an increase of human occurrence and disturbance. Changes in the structure of farming practices has been shown to be the most important factor affecting the quality of breeding grounds of the Great Bustard (Barati & Amerifar 2008, Abdulkarimi *et al.* 2010). Traditional farming is more common on Sootav plain and the fact that it has a low population density being a remote area has meant that this plain is very favourable as a breeding ground for Great Bustards and nest site selection. Compared to other habitats, dry cereal farmlands are most common in Sootav as well as human disturbance being very low. Despite these favourable conditions, the breeding population of the Great Bustard in Sootav plain has declined compared to previous years (Amini 2000).

Knowing that the population of the Great Bustard has decreased in Iran in recent years, it

is probable that some birds move between remaining suitable habitats, particularly in the west and north-west of Iran. However, it is also probable that there are some subpopulations in other areas (Kurdistan, Hamedan or Kermanshah provinces). Unfortunately, there has not yet been any extensive survey conducted on breeding populations or breeding habitats in Iran. It would thus seem that to conduct such a survey must be the most important priority to conserve the remaining populations of the Great Bustard in Iran.

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