



## Breeding Ecology of the Black-winged Stilt *Himantopus himantopus* in Boujagh National Park, Gilan Province, Northern Iran

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### Abstract

The breeding biology of the Black-winged Stilt *Himantopus himantopus* was studied in 22 Bahman wetland in Boujagh National Park, Gilan Province, and some characteristics of the breeding colony were investigated between early April and late July 2005. The nests were built on muddy substrates in shallow water bodies in open areas. Twenty-five nests were constructed in a 2-hectare L-shaped area. They were on average 1.85 cm in depth and had an external diameter of 15.3 cm and internal diameter of 11.6 cm. In 80% of the nests, aquatic plants comprised 20%–100% of the nest structure. The nesting season lasted until 9 May. The dominant clutch size was 4 (92% of the nests). The chicks hatched after  $25 \pm 0.62$  days, and after about 3 weeks they emigrated from the park together with their parents in groups of 14–18 individuals.

### 1. Introduction

The Black-winged Stilt *Himantopus himantopus* has a wide distribution in the world: Australia, Central and South America, Africa and large parts of North America and Eurasia (Pizzey 1997). The species breeds in the northeast, northwest, south and southwest of Iran (Mansoori 2008).

Some research has been carried out on the breeding biology of the Black-winged Stilt in Italy (Tinarello 1992) and in Spain (Castro 1993, Arroyo 2000, Cuervo 2003, 2004). Most of this work has emphasised the effects of habitat, location and characteristics of nests on breeding success (Cuervo 2005). There do not appear to have been any previous studies of the breeding biology of this species in Iran or elsewhere in the Middle East, except for some work carried out in the Hamedan

area in Iran in recent years (A. Barati, unpubl. data).

The Black-winged Stilt is not a regular breeder in Gilan. However, in 2005, a small colony of Black-winged Stilts bred in Boujagh National Park. In the present survey, some characteristics of the breeding biology of the Black-winged Stilts were studied at this breeding colony.

### 2. Study Area and Methods

#### 2.1. Study area

Boujagh National Park, with an area of 3,260 ha, is located in Gilan Province in the southwest of the Caspian Sea and is divided by the Sefid-Rud (river) into two main sections: a western part (the Boujagh area) and an eastern part (22 Bahman wetland and Kiashahr lagoon). The 22 Bahman wetland ( $37^{\circ}26'34''\text{N}$ ;  $49^{\circ}56'34''\text{E}$ ;  $-25$  a.s.l.) is situated in the Kiashahr region of Gilan Province. This 500-hectare wetland is located within the Kiashahr Lagoon Ramsar Site which, in 2009, was expanded to include the whole of Boujagh National Park. Because of the construction of a fishing harbour in 1992, 22

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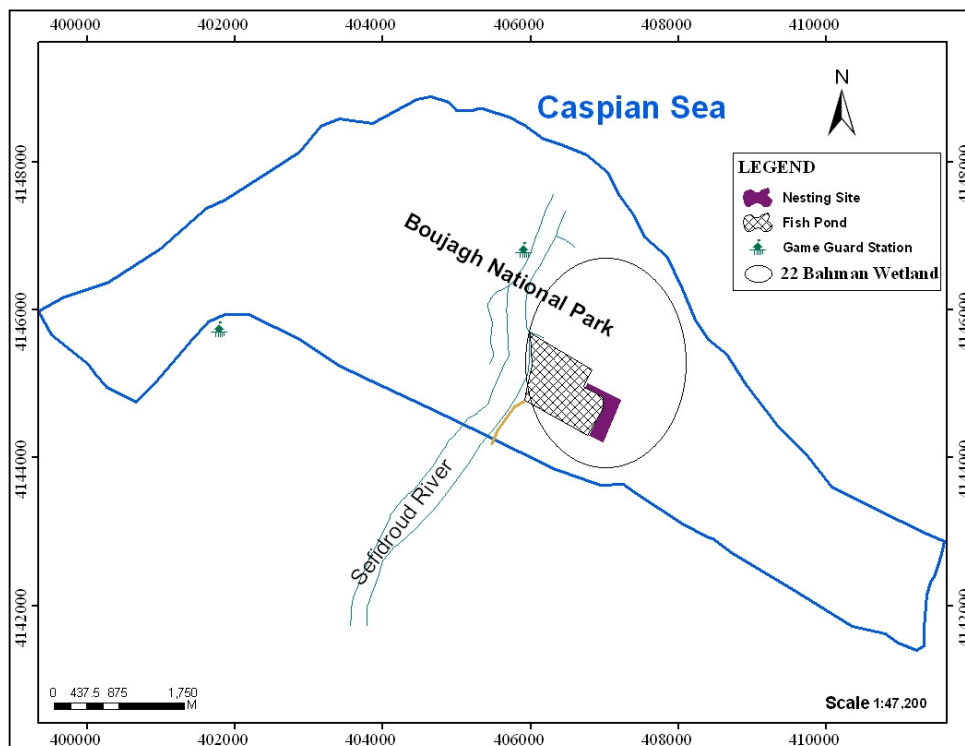


Fig. 1. Location of 22 Bahman and Kiashahr wetlands.

Bahman wetland became separated from the main Kiashahr Lagoon. The wetland extends west to the Sefid-Rud. It is a fresh- to brackish-water wetland, and often dries out in the summer months. The dominant plant species in the wetland are the Common Reed *Phragmites australis* and various rushes *Juncus* spp. The unique habitat diversity of Boujagh National Park provides suitable conditions for a wide range of resident and migratory birds throughout the year. Some 239 species of birds have been identified in the park. Breeding waterbirds include Black-winged Stilt, Garganey *Anas querquedula*, Collared Pratincole *Glareola pratincola*, Northern Lapwing *Vanellus vanellus* and Little Ringed Plover *Charadrius dubius* (Ashoori *et al.* 2008). In 2005, the Black-winged Stilts constructed twenty-five nests in a 2-hectare L-shaped area at the eastern edge of 22 Bahman wetland (Fig. 1). Nests of Garganey and Collared Pratincole were also present in the same area.

## 2.2. Materials and methods

This study was conducted within a larger avifaunal survey of Boujagh National Park during the period 2004–2006. During the

present study, visits were made to the area on 2 days per week from early April to late July 2005 (from 08:00 to 12:00 and 14:00 to 19:00). In total, 25 nests were detected and marked with numbered plastic tags hidden near the nests. Measurements of each nest were taken with a measuring tape. In addition, the biometrics of sixteen 1-day old chicks were taken with a measuring tape. The depth of water around the nests (accurate to 1 mm) and the distance between nests were also measured. The breeding behaviour of the Black-winged Stilts was investigated using a pair of binoculars (8×30 Zeiss) and a telescope (20×60 Kowa). Excel software was used for calculations and data analysis.

## 3. Results

The first flock of Black-winged Stilts (18 individuals) arrived in Boujagh National Park on 3 April, and by 9 April, the entire breeding population had arrived. The birds were observed in small groups in the shallow waters of Boujagh wetland, 22 Bahman wetland and Kiashahr lagoon and on sandy islands in the Sefid Rud. The nests were built between 28 April and 10 May on small patches of exposed

mud in open areas of shallow water at some distance from the reed-beds (Fig. 2). In total, about 5 ha of suitable breeding habitat for Black-winged Stilts were surveyed, and 25 nests were found in about 2 ha. The measurements of the nests were as follow: mean external diameter 153 mm; mean internal diameter 116 mm; and mean nest-cup depth 18.8 mm (Table 1). Four pairs (16%) of Black-winged Stilts built their nests beside a clump of rushes within the wetland, and aquatic plants were utilised in the construction of these four nests. No aquatic plants were present in five of the nests (20%), and the eggs were in shallow depressions on the bare ground. The remaining 16 nests were constructed with small amounts of aquatic plants. The mean water depth around the nests was about 300 mm (SD= 9, N= 25). The birds were breeding in groups, but the distance between any two nests was always more than 7 m (mean= 8.7±2.02; min=7; max=14).

Egg-laying commenced on 10 May. The average clutch size was 4.0±0.28 (N=25), the dominant clutch size being 4 (92% of the nests). The eggs (Fig. 3) hatched after 25±0.62 days (max=26, min=24). The measurements of 16 1-day old chicks were as follows: mean body length 95 mm; tarsus length 55 mm; bill length 13 mm; wing length, 35 mm; wingspan 95 mm (Fig. 4).

The Black-winged Stilts defended their nests and small territories, even against other stilts, and behaved aggressively towards invaders, even humans, posing as if with a broken wing to distract the attention of the invader from their nest and chicks. The defense of nests and chicks against birds of prey such as Marsh Harrier *Circus aeruginosus* and Eurasian Hobby *Falco subbuteo* was often observed, and frequently involved a group of stilts attacking the invading bird.

One week after hatching, the nesting area dried out, and three weeks after, the chicks fledged and left the breeding site along with their parents in groups of 14–18 individuals. The first flock of Black-winged Stilts consisted of 3 adult males, 3 adult females and 10 immature individuals. These adults and juveniles were observed in Boujagh wetland, several kilometers from the breeding site, in late June. The parents were still vigorously defending their chicks, even preventing

Common Redshanks *Tringa totanus* from approaching their group. It seemed that the chicks had still not developed sufficient skills to feed and defend themselves. After two weeks, this group left Boujagh National Park. Most of the other groups had left the region by early autumn, but one group of 10 individuals remained in the area until 20 November.

**Table 1.** Characteristics of Black-winged Stilt eggs and nests.

Character	N	Mean	SD	Max.	Min.
External diameter (cm)	25	15.3	0.73	16.0	14.0
Internal diameter (cm)	25	11.6	1.16	13.0	9.0
Nest-cup depth (cm)	25	18.8	0.9	20	18.1
Water depth around the nests (cm)	25	30	9	24	41
Clutch size	25	4.00	0.28	5	3



**Fig. 2.** Breeding habitat of Black-winged Stilts in 22 Bahman wetland.



**Fig. 3.** Nest and eggs of Black-winged Stilt in 22 Bahman wetland.





Fig. 4. Black-winged Stilt nestlings.

#### 4. Discussion

Regular surveys have shown that Black-winged Stilts are present mainly as summer visitors and passage migrants in Boujagh National Park. However, in some years, small groups of Black-winged Stilts remain throughout the winter in the wetlands of Gilan Province (Mid-winter Waterbirds Censuses in 2004, 2007, 2009).

The Black-winged Stilt is often found breeding with other waders (Cramp & Simmons 1983). In this study, other waterbirds such as Garganey, Collared Pratincole, Northern Lapwing and Little Ringed Plover were found breeding in the same area. At a well-studied colony of Black-winged Stilts in Spain and throughout most of the stilt's Western Palearctic range, the breeding period is from March to May (Cuervo 2005, Snow & Perrins 1998), whereas the breeding period in 22 Bahman wetland in 2005 was from late April to early July. The reason for the difference is not known but it may be that water levels and condition of the habitat in result of weather conditions are the most important factor.

In the Spanish colony, the frequency of a clutch size of 4 (79%; Cuervo 2005) was lower than in the present study (92%). Cuervo (2005) reported 19% for a clutch size of 3 and 2% for 2. In other studies, the clutch size was also between 3 and 4 (Cramp & Simmons 2000, Adret 1984, Arroyo 2000), and there do not appear to have been any previous reports of clutches of 5 eggs. The high frequency of clutches of 4 eggs and the occurrence of one clutch of 5 eggs in 22 Bahman wetland is probably a result of the good food supply and

high quality habitat for Black-winged Stilts in this wetland (A. Ashoori, pers. obs.).

In this study, as in previous studies (e.g. Sordahl 1994), adults were seen removing egg shells from the nest soon after hatching. Previous studies have also shown that in some cases, the chicks remain in the nest for one or two days after hatching, but in exposed sites, the parents lead them away from the nest within a few hours of hatching (Hamilton 1975, Adret 1984). This was also the case with the Black-winged Stilts in 22 Bahman wetland.

In the summer of 2005, 22 Bahman wetland provided suitable breeding habitat for Black-winged Stilts (supported by large clutch size and high breeding success). Unfortunately, in late 2005, the Department of Fisheries constructed about 100 ha of culture ponds for sturgeon in that part of 22 Bahman wetland in which the Black-winged Stilts had nested earlier in the year. Much of the natural wetland was destroyed, posing a threat to many of the breeding waterbirds. No Black-winged Stilts were found breeding in this wetland during the period 2006-2010 (A. Ashoori, pers. obs.), although they have visited the area in spring, apparently prospecting for breeding sites. If Black-winged Stilts are to breed again in Boujagh National Park, it is necessary that some management activities be carried out to restore the breeding habitat. Further destruction of 22 Bahman wetland should be prevented by prohibiting the development of fish ponds and demarcating the boundary of the park with a fence which would prevent the intrusion of humans and their livestock.

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#### References

- Adret P. 1984. Une etude des relations spatiales entre jeunes avocettes sur leurs lieuxd elevage. *Revue d ecologie (LA Terre et la vie)* **39**: 193–208.
- Arroyo G.M. 2000. *Influencia de las transformaciones humans de habitats costeros supralitorales sobre la ecologia de la reproduction de la ciguenuela Himantopus himantopus y la avoceta Recurvirostra avosetta en la Bahia de Cadiz: aplicacion a la gestion de*

- espacios naturales Protegidos*. PhD Thesis, University of Cadiz, Puerto Real, Spain.
- Ashoori A., Nezami Sh. & Zolfinzhad K. 2008. Identification of Boujagh National Park Kiashahr Birds. *Journal of Environmental Studies* **34**: 101–112 [In Persian].
- Cramp S. & Simmons K. (Eds) 1983. *The Birds of the Western Palearctic*. Oxford University Press, Oxford.
- Cuervo J.J. 2003. Parental roles and mating system in the Black-winged Stilt. *Can. J. Zool.* **81**: 947–953.
- Cuervo J.J. 2004. Nest-site selection and characteristics in a mixed-species colony of Avocets *Recurvirostra avosetta* and Black-winged Stilts *Himantopus himantopus*. *Bird Study* **51**: 20–24.
- Cuervo J.J. 2005. Hatching success in Avocet *Recurvirostra avosetta* and Black-winged Stilt *Himantopus himantopus*. *Bird Study* **52**: 166–172.
- Hamilton R.B. 1975. Comparative behavior of the American avocet and the black-necked stilt. *Ornithological Monographs* **17**: 32–36.
- Mansoori J. 2008. *A Field Guide to the Birds of Iran*. Farzaneh Publishing, Tehran. [In Persian]
- Pizzey G. & Knight F. 1997. *Field Guide to the Bird of Australia*. Angus-and Robertson, Sydney.
- Pringle G.D. 1987. *The Shorebirds of Australia*. Angus and Robertson and the national photographic index of Australia wildlife, Sydney.
- Robson C. 2000. *A field Guide to the Birds of South-east Asia*. non Holland Publishers (UK) Ltd.
- Schodde R. & Tideman S.C. (Eds.) 1990. *Readers digest complete book of Australia birds (2nd edition)*. Readers Digest (Australia) Pty Ltd, Sydney.
- Scott D.A., Moravvej Hamadani H. & Adhami Mirhosseyni A. (Eds.) 1975. *The Birds of Iran*. Department of the Environment, Tehran, 410 pp. [In Persian].
- Sordahl R. 1994. Eggshell removal behavior of American avocets and Black-necked stilt. *J. Field Ornithol.* **62**: 461–465.
- Snow D.W & Perrins C.M. 1998. *The Birds of the Western Palearctic.-Concise edition*. Volume1. Non- passerines. Oxford University Press.
- Tinarelli R. 1992. Habitat preference and breeding performance of the Black-winged Stilt *Himantopus himantopus* in Italy. *Wader Study Group Bull.* **65**: 58–62.