

Observations on breeding behavior of the White-eared Night Heron (*Gorsachius magnificus*) in northern Guangdong, China

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Abstract The White-eared Night Heron (*Gorsachius magnificus*) is a Class II protected species in China. It is difficult to observe in the field and its population is small. The present study reports a new distribution site in Nanxiong County, in northern Guangdong Province, where observations of an active nest were made from 4 May to 14 July 2012, the first time consecutive observations have been made for a period of more than two months. The adults flew away from the nest at night, with a peak at 19:00–20:00 and returned in the mornings with a peak at 04:30–05:30. The peak time for feeding young was at 05:00–05:30, accounting for 26.5% of total feeding activities. No feeding occurred from 10:00 to 16:00. The results of our study of its behavior explain why the White-eared Night Heron is usually observed in the evening just before dark, or in the morning before sunrise, at least during the breeding season. There were about 67 days from hatching to fledging, longer than the fledging time of most heron species. This study is the first to cover the entire period of parental care and fills a gap in previous knowledge.

Keywords breeding behavior, White-eared Night Heron, rearing period

Introduction

The White-eared Night Heron (*Gorsachius magnificus*) is known to reside in southern China and northern Vietnam (BirdLife International, 2001). In China, about 30 distribution sites in Hubei, Anhui, Zhejiang, Fujian, Jiangxi, Hunan, Sichuan, Guizhou, Yunnan, Guangxi, Guangdong and Hainan provinces are known through extensive survey efforts since 2001 (He et al., 2011).

Most of the early work has consisted of reports from new distribution localities (Fellowes et al., 2001; Pilgrim et al., 2009; Song et al., 2011). The ecology of the species is not well known except for a few studies on the feeding behavior and activity budgets in captivity (Zhou et al., 2005a; Yu et al., 2006) and breeding descriptions (Li et al., 2007). Studies on the ecological requirements and behavior of the species are essential to successful conservation management (Fellowes et al., 2001; He et al., 2007a; Pilgrim et al., 2009). Many distribution sites have been recorded, based only on very brief flying records of the White-eared Night Heron, where most occurred during evenings just before dark, with some in the morning before sunrise (Fellowes et al., 2001; Lu et al., 2004; King, 2005; He et al., 2007a). We might ask

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why this bird can most easily be watched at sunset. Is this associated with its behavior, or purely due to visibility? Observations lasting for more than two months were made in 2012 at a newly discovered nesting location. The main goal was to study breeding behavior of the White-eared Night Heron and to understand why this species is seen in such a narrow time window.

Methods

Study site

This new distribution site for the White-eared Night Heron (He et al., 2011) is at Xiaoliukeng Reservoir, Nanxiong County, in northern Guangdong Province. The location of the nest was at 25°01.938'N, 114°21.203' E, where the average elevation above sea level is about 356 m (Fig. 1). The site is within the Xiaoliukeng and Qingzhangshan Provincial Nature Reserve.

Xiaoliukeng has a subtropical monsoon climate with an average annual temperature of 19.6°C and long-term average annual rainfall of 1555 mm.

Vegetation sampling

Vegetation sampling was conducted within 10 m × 10

m quadrats, for a total of five quadrats around the nest tree. Species identity, number and DBH (diameter at breast height) of trees higher than 1.5 m were recorded and height and canopy cover of trees over 1.5 m were estimated. Trees smaller than 1.5 m in height were classified as shrubs. Species identity and number of stems were recorded and shrub height was estimated. We defined four 1 m × 1 m sub-plots in each 100 m² quadrat for recording herbaceous plants. Species of herbs were recorded and cover was estimated as reported elsewhere (Zhang et al., 2011).

Behavior record

The entire survey was conducted from 4 May to 14 July in 2012. On 1 May we were told that a White-eared Night Heron had been found. Field observations began on 4 May. Field work was divided into three periods. In period 1, observation trips were made with a small boat from 4 to 15 May, twice each day. We mainly observed whether the nest had young birds, using both a telescope and binoculars. One adult always stayed in the nest. We first saw the white feathers of a chick under the body of the adult during the afternoon trip of 11 May. We decided to set up camp close to the nest tree (about 30 m away) in order to obtain more information and

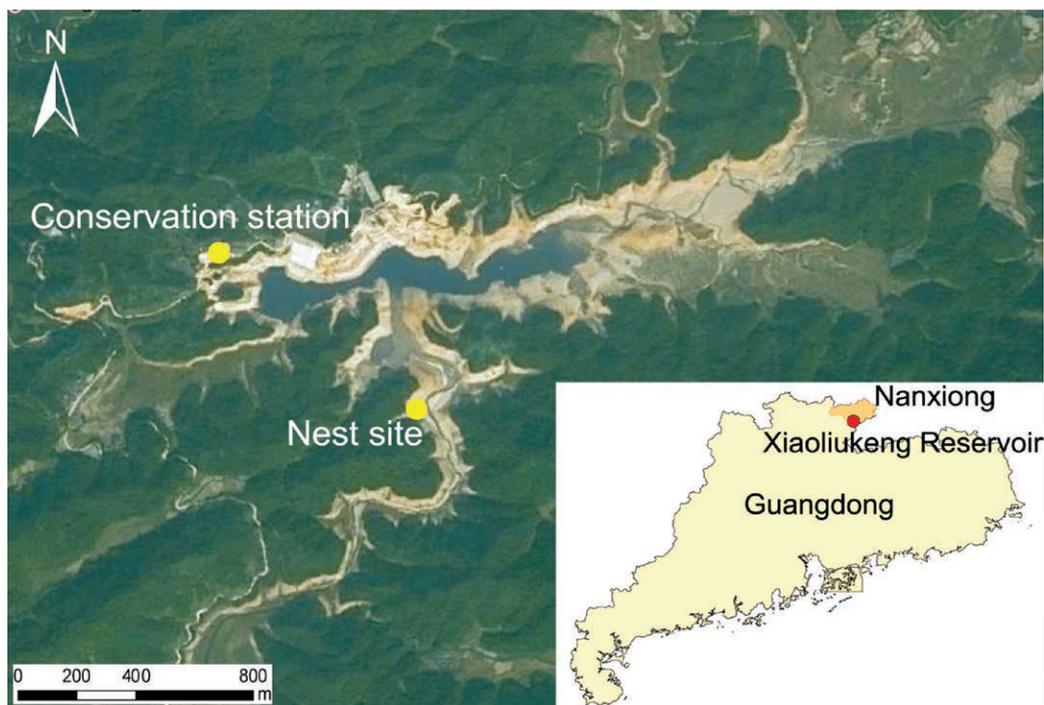


Fig. 1 Location of nests of the White-eared Night Heron

did so on 16 May. This marked the beginning of period 2, when spot observations with binoculars were made near the nest tree. The main types of behavior (for example an adult bird flying away from or returning to the nest, feeding and juvenile activity) were recorded without disturbing the herons. During period 3, continuous 24-hour intensive observations with binoculars were carried out during 21–23 May, 6–8 June, 11 June, and 15–17 June, when we recorded these main types of behavior.

Results

Vegetation

The native vegetation was an evergreen broadleaved forest. At the breeding site, the most common tree species are *Schima superba*, *Castanopsis hystrix*, *Loropetalum chinense* and *Pinus massoniana*. Mean diameter at breast height (DBH) was 28.7 ± 2.2 cm and mean height 7.1 ± 0.3 m. The canopy cover was about 80%. The most abundant shrub species are *Symplocos lancifolia*, *Machilus velutina* and *Ardisia crenata*. The mean height of this layer was 0.6 ± 0.1 m. The most abundant herb species are *Woodwardia japonica*, *Gahnia tristis* and *Dicranopteris pedata*. The mean herb canopy coverage was 9%.

Nest description

Two nests, referred to as Nest 1 and Nest 2, were found. The distance between the two nests was about 100 m. The shape of the two nests was the same, of a circular, tray-shaped, simple construction. Nest 1 was a new nest, built by the White-eared Night Herons in 2012. This nest, 35 cm in diameter, 25 cm in height and 6 cm deep, was at the end of a main branch of a *Cinnamomum parthenoxylon*, pointing north-east. The nest was 2.4 m above the ground, 4–6 m above the water (changing with the water level), 5 m from the tree canopy and 4 m from the trunk. Only two individual adults were observed there: one sat in the nest, while the other stood nearby during the first survey trip. Nest 2, 30 cm in diameter, 20 cm in height and 5 cm deep, was at the end of a main branch of a *Castanopsis hystrix*, pointing north-east, and was an old nest. This nest was 1.5 m above the ground and 2.5–4.5 m above the water (again depending on the water level), 6 m from the tree canopy and 4.5 m from the trunk.

Flight times

On the 39 days between 16 May and 14 July the adult birds were seen flying away from or returning to the nest site. They flew away at night, usually at 19:00–20:00 and occasionally between 00:00 to 06:00. They flew back to the nest in the morning at 04:30–05:30, but sometimes from 00:30 to 04:00 or from 20:00 to 24:00 (Fig. 2). Usually, the adult did not directly fly back to the nest tree, but to other trees about 5–6 m away. No flying activity was observed from 06:00 to 19:00.

Feeding behavior

The first feeding occurred on 21 May 2012. Thirty-four instances of feeding chicks were observed during 23 days. The peak time of feeding was at 05:00–05:30, accounting for 26.5% of total feeding activities. No feeding was observed from 10:00 to 16:00 (Fig. 3). Usually, the parent fed the baby bird once a day, accounting for 69.6% of the 23 days. But sometimes, the parent fed the baby twice or more often per day, accounting for 30.4% of the feeding period, up to five times on 21 May. While one parent fed the chick, the other parent typically stood nearby. Each time the parent put its beak into that of the chick and regurgitated the food. Feeding times were very short, usually less than 1 min.

Juvenile behavior

The white downy chick could be seen under the parent bird on 11 May. This was estimated to be a few days after the chick was hatched. The chick slept and rested most of the time, sometimes slowly stretching its legs and pecking at nest material, during the period from 11–20 May. It stood up in the nest on 20 May. Some primary feathers had become grey on 21 May. Grey back feathers could also be seen on 22 May. We saw the chick walk in the nest on 27 May. The first stretched wing was seen on 7 June, when it seemed the chick began learning to fly. The chick was seen walking outside the nest on 10 June. It could hop between branches four days later. The first flight was on 28 June, with a flight distance of about 10 m. The distances increased and flying became more frequent as the chick grew. In the end, the chick flew out of observation range on 6 July. This day can be taken as the fledging date. The parental care period lasted 67 days from hatching to fledging. Three birds, consisting of both parents and last-year's chick

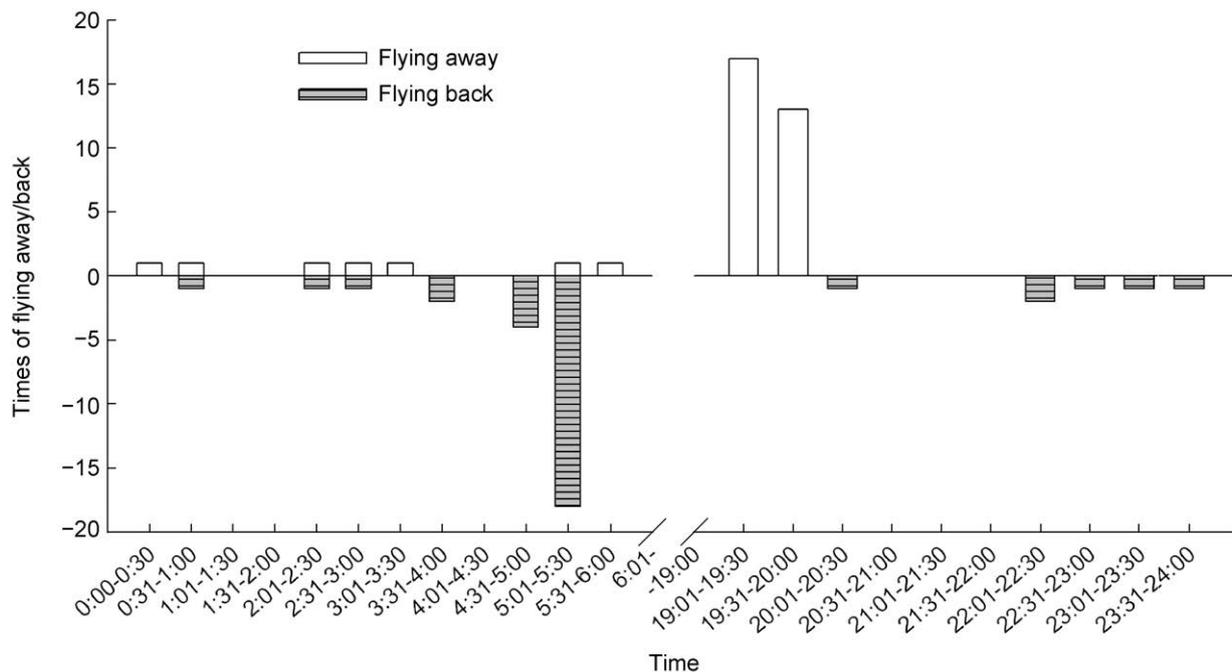


Fig. 2 Flight times

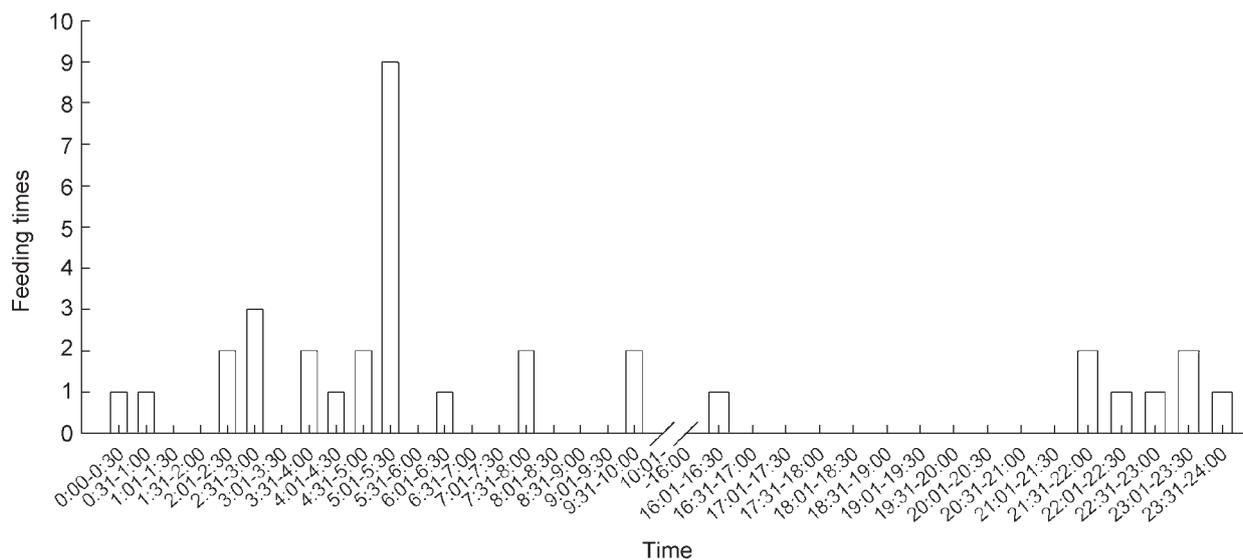


Fig. 3 Feeding times for the White-eared Night Heron

were seen in the nesting area in May 2013.

Discussion

This is the fifth distribution site in Guangdong after Chebaling, Luyan, Yinde and Longmen (Gao et al., 2000, Yang et al., 2007; He et al., 2011). The location falls within the Nanling subpopulation identified by He

et al. (2007b), apparently a large contiguous one.

Most breeding sites of the White-eared Night Heron in the south of China are below 600 a.s.l. (Lu et al., 2002; Song et al., 2011) and Nanxiong falls within this range. The White-eared Night Heron is a cryptic bird species, requiring good vegetation canopy cover. The forest canopy cover at Nanxiong is more extensive than in the recorded sites in Fusui and Shangsi counties in

Guangxi Zhuang Autonomous Region, but similar to those in Shennongjia, Hubei Province and Jinggangshan, Jiangxi Province, as well as at the Thousand Island Lake, Zhejiang Province (Zhou et al., 2005b; Li et al., 2007; Song et al., 2011).

During observations in captivity, the peak of activity usually occurs in the morning (05:00–07:00 am), or in the evening (19:00–21:00 pm), or even at midnight (23:00–01:00 am) (Yu et al., 2006). Recorded observation times of White-eared Night Herons include 16:30 on 19 October 2003 at Lushan, Jiangxi Province (He et al., 2007a); 18:44, 19:00 and 19:01 on three consecutive evenings on 8–10 April 2000 at Chebaling, Guangdong Province (Fellowes et al., 2001) and 19:30 on 30 March 2000 at Biannian Village in Guangxi (Fellowes et al., 2001). The four observations at 18:44–19:30 in southern China show this is a good time to detect White-eared Night Herons in their breeding season. Our study showed that 19:00–20:00 was the peak period for the adult birds flying away from the nest, matching most previous brief observations. On the other hand, Lu et al. (2004) recorded 13 feeding activities, i.e., five between 19:00–19:40 and eight in the period from 08:00–15:00. Thus the observations of Lu et al. (2004) showed more diurnal activity. Lu et al. (2004) thought that juvenile White-eared Night Herons had a high energy requirement during the breeding period, such that adults had to bring food during the day.

Li et al. (2007) reported that the incubation period of the White-eared Night Heron is 25 days but did not measure the rearing period. This study is the first covering the entire period of parental care. In other herons, the period of parental care is shorter; for example, 25–31 days for the Chinese Pond Heron (*Ardeola bacchus*) and 20–22 days for the Striated Heron (*Butorides striata*). The longest recorded period is for the Grey Heron (*Ardea cinerea*), about 60 days (Zhu and Zou, 2001). Our observation of a 67-day care period thus makes the White-eared Night Heron one of the slowest heron species to fledge. Our study fills a gap in previous knowledge.

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广东北部海南鵞 (*Gorsachius magnificus*) 的繁殖行为观察

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摘要: 海南鵞 (*Gorsachius magnificus*) 是国家 II 级重点保护鸟类, 在野外较难观察到, 并且其种群数量较小。2012 年 5 月, 我们在广东北部的南雄县发现了一处海南鵞新的分布地。本文报道了该分布地海南鵞的繁殖行为。整个观察期从 2012 年 5 月 4 日持续至 7 月 14 日, 是迄今为止在野外对海南鵞进行连续观察最长的一次。结果表明: 繁殖期海南鵞亲鸟晚上飞离巢地, 飞离时间的高峰出现在 19:00–20:00; 次日早晨返回巢地, 归巢时间的高峰为 04:30–05:30。亲鸟喂雏的时间多发生在 05:00–5:30 (占整个该类行为的 26.5%), 从 10:00 到 16:00 没有观察到亲鸟喂雏的行为。本文从繁殖行为结果解释了海南鵞多数情况下是在天黑前或者黎明前容易被观察到的原因。海南鵞从出雏到幼鸟离巢需要 67 天以上的时间, 比多数鹭科鸟类的育雏时间长。研究结果弥补了以往海南鵞育雏时间长短不明确以及育雏行为资料不足的缺陷。

关键词: 繁殖行为, 海南鵞, 育雏期