# Marsh Grassbird *Locustella pryeri* nestlings leaving and returning to their nests

M. TAKAHASHI, M. KAMIOKI & K. UEDA

Fledging is a serious event for altricial nestlings. The length of the nestling period and the timing of fledging strongly affect their survival rate (e.g. Freed 1988, Remeš & Martin 2002, Heinsohn *et al*. 2011). Short nestling periods and early fledging cause the deaths of early fledglings because of cool temperatures and weak mobility, but reduce the risk of nest predation, nest submergence and other kinds of reproductive failure, and may provide nestlings an advantage in securing food (Johnson *et al*. 2004). In contrast, long nestling periods and delayed fledging increase the risk of reproductive failure, but can lead to increased growth and fat storage, and thermal benefits provided by siblings and the nest structure (Johnson *et al*. 2004).

Nestlings of larger species such as raptors, owls and herons leave and return to their nests repeatedly before departing the nest for good. In contrast, nestlings of smaller birds such as passerines leave their nests abruptly and often never return. Therefore, in passerines it is important to determine whether premature nestlings have the behavioural capacity to return to their nest from the wider environment in the event of accidental early fledging. However, as far as we know there are very few reports of passerine nestlings returning to their nest (e.g. House Wren *Troglodytes aedon*: Skutch 1953, Johnson *et al*. 2004; House Finch *Carpodacus mexicanus*: Evenden 1957; Sprague's Pipit *Anthus spragueii*: Fisher *et al*. 2010).

Here we report some cases based on individual identification and video-recording where the nestlings of the Marsh Grassbird *Locustella pryeri* returned from the wider environment to their nests.

The Marsh Grassbird, also called Japanese Swamp Warbler or Japanese Marsh Warbler, is a Near Threatened passerine (BirdLife International 2017) endemic to East Asia (Morioka & Shigeta 1993, Nagata 1997, Bairlein 2006). Its nests are built near the ground in the understorey vegetation of wet grassland. The nest shape depends on the nature of the surrounding vegetation and is classified into one of three types: i) dome-shaped without decorations, built in a damp site with a large amount of dry grass; ii) dome-shaped but decorated with live grass, in a dry site with abundant live grass; and iii) cup-shaped, in intermediate habitat or a site lacking undergrowth (Nishide 1975, Takahashi *et al*. 2013). The nestling period ranges from 10 to 15 days; the mean from 120 nests is 12.4 ± 0.8 days (Takahashi 2013). Nestlings leave their nest on foot during fledging, before they have fully developed flight abilities (Takahashi 2012).

An ecological study of the Marsh Grassbird was carried out between April and September in 2007 to 2009 in the Hotokenuma wetland (40.817°N 141.367°E), Aomori prefecture, northern Honshu, Japan. The 744 ha wetland consists of freshwater wet grassland and reedbeds dominated by the reed *Phragmites australis* and some sedges *Carex*. We monitored a total of 250 nesting attempts by 209 males over three years. Most adults and nestlings were uniquely colour-banded and three indices of body size (wing length, tarsus length and body weight) were measured. The state of development of nestlings was determined by the wing length, which reflects the length of the primary feathers, not by body weight (Johnson *et al*. 2004). All nests were checked at least every two days from their discovery until successful fledging or nesting failure. Parental behaviour was videoed (using JVC Everio GZ-MG300) during the nestling stage at 89 nests in 2008 and 2009. The camera was placed at the same height as the nest and several metres from it so that the whole nest and a distance of 20 cm around it were surveyed by the camera. Each nest was videoed generally three times: in the early stage at 2–4 days old (hatching defined as day 0), middle stage (5–7 days old) and late stage (8–10 days old). The average recording time for each nest was about 11 hours/day.

We observed 26 occasions at three nests when nestlings returned to their nest from the external environment. In all these cases, the nestlings left and returned to the nest on foot. Parental feeding and competition among nestlings did not relate to this behaviour.

Nest T25 was built by a colour-ringed breeding pair (polygamous male I074 and female G029) and contained five eggs, which hatched on 25 June 2008. Nestlings were colour-ringed at 4 days old (29 June 2008) and measured at 8 days old (3 July 2008). Video-recordings were made when the nestlings were 3, 7 and 11 days old. Eight return movements were recorded between 06h42–18h42 at 11 days old (6 July 2008). The second most-developed nestling (T25-1) left the nest twice on foot and was out of the video-recording range for extended periods (5.3 and 71.65 minutes); we believe that it moved some distance away from the nest. It returned to the nest on foot. It left the nest again at 10h40 and did not return during the video-recording period; we consider that it fledged successfully. The most-developed nestling (T25-2) left and returned to the nest twice; the third nestling (T25-5) left the nest three times, once leaving the video-recording range for an extended period (82.07 minutes); the fourth nestling (T25-3) left the nest once and the least-developed nestling (T25-4) remained in the nest. The nestlings returned to the nest between 12 seconds and 82.07 minutes after leaving. Apart from T25-1, we confirmed that all the nestlings fledged successfully on 8 July 2008.

Nest T38 was built by a colour-ringed breeding pair (monogamous male I058 and female G042) and contained five eggs, which hatched on 6 July 2008. Nestlings were colour-ringed at 6 days old (12 July 2008) and measured at 8 days old (14 July 2008). Video-recordings were made when the nestlings were 3, 6, 7, 10 and 11 days old. Two return trips were recorded between 07h05–18h40 at 10 days old (16 July 2008), and seven were recorded between 06h34–18h33 at 11 days old (17 July 2008). The third nestling (T38-2) left and returned to the nest four times, once leaving the video-recording range for an extended period of 24.0 minutes (Movie 1, available at: www.momo-p.com/showdetail-e.php?movieid=momo180417lp01b). The fourth nestling (T38-4) left once and an unidentified nestling left four times, on one of these occasions leaving the video-recording range for a short period (77 seconds). These nestlings returned to the nest after between 14 seconds and 24.0 minutes. We confirmed that all the nestlings fledged successfully on 18 July 2009.

Nest D005 was built by a colour-ringed breeding pair (monogamous male P022 and female H003) and contained three eggs, which hatched on 19 June 2009. Nestlings were colour- ringed at 4 days old (23 June 2009) and measured at 8 days old (27 June 2009). Video-recordings were carried out when the nestlings were 2, 3, 5, 7, 9 and 12 days old. Nine return trips were recorded between 06h17–12h35 at 12 days old (1 July 2009). The middle nestling (D005-3) left and returned to the nest seven times and the most-developed nestling (D005-2) twice; the least-developed nestling (D005-1) remained in the nest. The two nestlings returned to the nest after between 5 and 13 seconds after they left. We confirmed that all the nestlings fledged successfully on the evening of 1 July 2009.

Our observations show that nestlings of the Marsh Grassbird apparently make return trips out of their nests during early fledging, which may be a unique behavioural characteristic of these birds. However, we do not yet have data on the proximate factors determining this behaviour. The behaviour may provide some benefits to the grassbird: in this breeding population, the nesting success rate was found to be relatively high and nest predation occurred rarely (Takahashi 2013), suggesting that nests are safer than the external environment for nestlings and we assume that this behaviour evolved in the Marsh Grassbird owing to the safety that the nest provides.

## Acknowledgements

We thank Jun-ichi Ebina and Akio Miya for help during the fieldwork. The Ministry of the Environment of Japan issued permits to trap and colour-band birds. This research was funded by grants from the 'Inui Memorial Trust for Research on Animal Science'. We would like to thank Dr Yoko Tsuchiya and Editage for English language editing.

## References

Bairlein, F. (2006) Family Sylviidae (Old World Warblers). Pp.492–709 in J. del Hoyo, A. Elliott & D. A. Christie, eds. *Handbook of the birds of the world*, 11. Barcelona: Lynx Edicions.

BirdLife International (2017) Species factsheet: *Locustella pryeri*. Downloaded from http://www.birdlife.org on 13/12/2017.

Evenden, F. G. (1957) Observations on nesting behavior of the House Finch. *Condor* 59: 112–117.

Fisher, R. J., Dohms, K. M. & Davis, S. K. (2010) Removal of nestling radio-transmitters by adult Sprague's Pipit (*Anthus spragueii*). *J. Orn.* 151: 749–753.

Freed, L. A. (1988) Forced fledging: an investigation of the lengthy nestling period of tropical house wrens. *Natn. Geogr. Res.* 4: 395–407.

Heinsohn, R., Langmore, N. E., Cockburn, A. & Kokko, H. (2011) Adaptive secondary sex ratio adjustments via sex-specific infanticide in a bird. *Current Biology* 21: 1744–1747.

Johnson, L. S., Rauch, R. L. & Dellone, S. N. (2004) The process and causes of fledging in a cavity-nesting passerine bird, the House Wren (*Troglodytes aedon*). *Ethology* 110: 693–705.

Morioka, H. & Shigeta, Y. (1993) Generic allocation of the Japanese Marsh Warbler *Megalurus pryeri* (Aves: Sylviidae). *Bull. Natn. Mus. Nature & Science Series A (Zoology)* 19: 37–43.

Nagata, H. (1997) Present status of the Japanese Marsh Warbler (*Megalurus pryeri*) and its conservation. *J. Yamashina Inst. Orn.* 29: 27–42. (In Japanese with English summary.)

Nishide, T. (1975) Survey of Japanese marsh warbler *Megalurus pryeri* in Hachirogata reclaimed land, Akita Pref. 1. Habitat distribution and breeding. *J. Yamashina Inst. Orn.* 7: 681–696. (In Japanese with English summary.)

Remeš, V. & Martin, T. E. (2002) Environmental influences on the evolution of growth and developmental rates in passerines. *Evolution* 56: 2505–2518.

Skutch, A. F. (1953) Life history of the southern house wren. *Condor* 55: 121–149.

Takahashi, M. (2012) Growth, development, and estimation of age of nestlings of the Japanese Marsh Warbler *Locustella pryeri*. *Bull. Japanese Bird Banding Assoc.* 24: 51–61. (In Japanese with English summary.)

Takahashi, M. (2013) Population dynamics and breeding habitat selection in the Japanese Marsh Warbler *Locustella pryeri*: identification of selection factors at multiple spatial scales. Tokyo: Rikkyo University (PhD thesis). (In Japanese with English summary.)

Takahashi, M., Aoki, S., Kamioki, M., Sugiura, T. & Ueda, K. (2013) Nest types and microhabitat characteristics of the Japanese Marsh Warbler *Locustella pryeri*. *Orn. Sci.* 12: 3–13.

***M. TAKAHASHI**, Faculty of Agriculture and Life Science, Hirosaki University, 3 Bunkyo-cho, Hirosaki, Aomori, 036-8561, Japan. Email: hachi77vanellus@yahoo.co.jp*

***M. KAMIOKI**, Tokyo College of Environment. 3-3-7 Kotobashi, Sumida, Tokyo, 130-0022, Japan*

***K. UEDA**, Department of Life Sciences, Rikkyo University, 3-34-1 Nishi-Ikebukuro, Toshima, 171-8501 Tokyo, Japan*

# Re-nesting of the Blood Pheasant *Ithaginis cruentus*

JIA CHENXI & SUN YUEHUA

## Introduction

Re-nesting, the laying of a replacement clutch following the loss of an initial clutch, is important to the population dynamics of many avian species. In the case of galliforms, re-nesting by grouse Tetraonidae has been investigated in a number of studies (e.g. Zwickel & Lance 1965, Giesen & Braun 1979, Connelly *et al*. 1993); however, it is little known in pheasants Phasianidae, except for Common Pheasant *Phasianus colchicus* (Gates 1966).

The Blood Pheasant *Ithaginis cruentus* is a ground-nesting bird which inhabits coniferous and mixed coniferous and deciduous forests on the Qinghai–Tibet Plateau and surrounding high mountains, from 2,135 to 4,575 m (Johnsgard 1999). Its nests are placed generally in depressions at the base of trees, rocks or fallen trunks. Most eggs in a clutch (5–10 in our experience) are laid at two-day intervals, and the female starts incubation when the last egg is laid; incubation takes as long as 37 days, in part because the female needs to forage for 6–7 hours a day (Jia *et al*. 2010). Here we provide the first documented report of re-nesting by Blood Pheasants.

## Study area and methods

Fieldwork was carried out between 2000 and 2002 at the Lianhuashan Nature Reserve, Gansu province, China (34.93°N 103.73°E). Forest habitat occurs in the reserve on north-facing slopes and some north-east- and north-west-facing slopes between 2,600 and 3,600 m. Only shrubs and grasses grow on south-facing slopes. The area was described in detail by Sun *et al*. (2003).

We captured 13 female Blood Pheasants during early April using a treadle snare (Petrides 1946)—4 in 2000, 5 in 2001 and 4 in 2002. One female which nested in 2001 also nested in 2002 (Table 1). Birds were fitted with necklace transmitters weighing less than 16 g. All birds were also marked with individually coloured leg bands. Radio-tagged birds were monitored from April to July each year.

We monitored the egg-laying behaviour of Blood Pheasants by recording egg temperatures to determine whether the female was on or off the nest. The temperature probe, connected by a conductor to a Gemini datalogger (Tiny Talk II, Gemini Data Loggers UK Ltd, Chichester, UK), was inserted into the bottom of the nest cup directly or was fixed into an egg filled with paraffin wax. The temperature

**Table 1. Blood Pheasant *Ithaginis cruentus* breeding results from 2000–2002 at Lianhuashan, Gansu, China.**

| | | | Failed nests | | |
|---|---|---|---|---|---|
| Year | No. of nests monitored | No. of nests where eggs hatched | During egg laying | During incubation | Re-nests |
| 2000 | 4 | 2 | 0 | 2 | 0 |
| 2001 | 5 | 2 | 0 | 3 | 0 |
| 2002 | 5 | 1 | 2 | 2 | 2 |