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BROOD CARE OF THE CHESTNUT-BELLIED MALKOHA, *PHAENICOPHAEUS SUMATRANUS SUMATRANUS* RAFFLES, 1822

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INTRODUCTION

This paper documents the brood care of the chestnut-bellied malkoha (*Phaenicophaeus sumatranus sumatranus* Raffles, 1822) in the Central Catchment Nature Reserve of Singapore. The chestnut-bellied malkoha is one of 16 species of malkoha and belongs to the family Cuculidae, subfamily Phaenicophaeinae and tribe Phaenicophaeini. In Singapore it is the only surviving malkoha species after the black-bellied malkoha (*Phaenicophaeus diardii diardii*) (Fig. 1) went extinct in the 1960s (Wang & Hails, 2007). The Raffles' malkoha (*Phaenicophaeus chlorophaeus*) (Fig. 2) and red-billed malkoha (*Phaenicophaeus javanicus*) were also reported to have been sighted and collected from Singapore in 1895 (Lim & Gardner, 1997) although they are regarded to be of doubtful provenance (Wang & Hails, 2007).

The chestnut-bellied malkoha has been listed as globally near threatened in the 2008 IUCN Red List (Birdlife International, 2008). It is found in southern Myanmar, southern Thailand, Peninsular Malaysia, Sumatra and Borneo. In Singapore this species is only found in small numbers at the Bukit Batok Nature Park, Bukit Timah Nature Reserve, Central Catchment Nature Reserve, Lorong Asrama, Pulau Ubin and Sungei Buloh Wetland Reserve (Wang & Hails, 2007). The chestnut-bellied malkoha is listed as being globally near threatened because its populations are experiencing moderately rapid declines owing to the extensive loss of lowland broad-leaved evergreen forests from large areas of the Sundaic lowlands. This holds true for Singapore as well, with 95% of the native lowland rainforest being cleared in the past 180 years (Marjorie et al., 2000), with barely 200 ha (2 km^2) of primary forest found in the Central Catchment Reserve and Bukit Timah Nature Reserve (Corlett, 1992). It is not considered more threatened because it is a versatile species that is able to use secondary forest habitats and occurs at higher elevations (Birdlife International, 2008). Unlike other cuckoos that are notorious as brood parasites, this species builds its own nest and takes care of its own young (Payne, 1997) (Fig. 3).

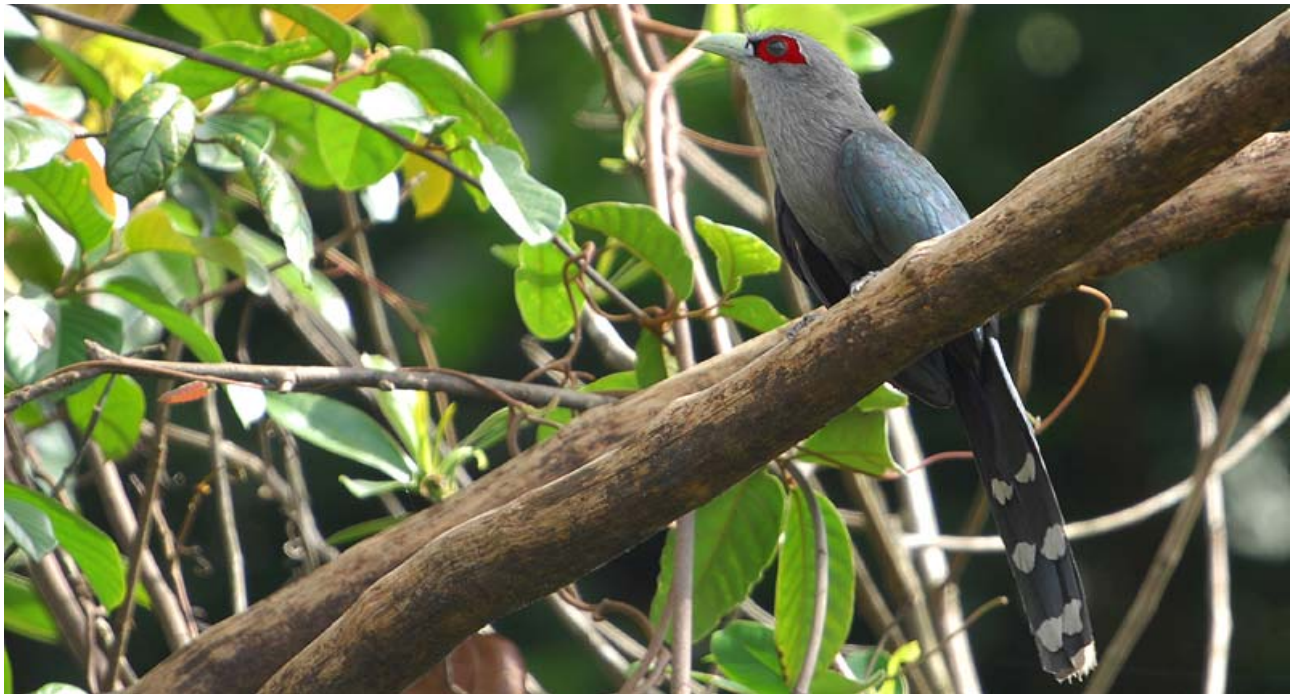

Fig. 1. Black-bellied malkoha (*Phaenicophaeus diardii diardii*) which has gone extinct in Singapore since the 1960s. (Photo by Mark Chua).

Fig. 2. The Raffles' malkoha (*Phaenicophaeus chlorophaeus*) (male), said to have been recorded from Singapore, here photographed in Peninsular Malaysia in a lowland forest. (Photo by Mark Chua).

Fig 3. A chestnut-bellied malkoha sitting on a nest of twigs and leaves. (Photo by Lee Tiah Kee).

OBSERVATIONS AND DISCUSSION

In late Jul.2008, a pair of chestnut-bellied malkohas was observed nesting at the Mandai Orchid Garden (200 Mandai Lake Road, near its restaurant area). Two white eggs roughly 3 × 2 cm were observed, but after a few days only one egg remained in the nest. The number of eggs in a clutch is usually 2–3 and is consistent to those reported by Payne (1997) and Kameda (1999), who observed the breeding in Borneo of the chestnut-bellied malkoha and Raffles's malkoha, respectively. It is not known when the nest building started or how long its construction took. We, however, know from the staff members of the Mandai Orchid Garden that a pair of chestnut-bellied malkohas also nested there a year ago in a potted shrub in another part of the garden, although we could not ascertain if the two pairs were indeed the same. The nest was a crudely built, flat platform made from large twigs, lined with leaves and was built 3 m off the ground in an annatto (*Bixa orellana*) tree, which was heavily parasitised by the local mistletoe (*Macrosolen cochinchinensis*) (Fig. 3). This nest is similar in structure to that of the Raffles' malkoha, which Kameda (1999) reported as being placed about 20 m up in the crown of a *Carallia brachiata* tree in Aug.1996 at Lambir Hills National Park in Sarawak, Malaysia.

By 19 Aug.2008, the chick was noticed to have hatched, and the parents were observed to sit on the nest in the early mornings, in the evenings and possibly overnight. The parents would leave the nest to forage for food (Fig. 4) from mid-morning, returning with food every one hour or so. This habit is also observed in the Raffles' malkoha, which was reported to have its first feeding at 0957 hrs and the last at 1635 hrs, with a feeding interval of 8–71 minutes (Kameda, 1999). During bad weather, the frequency of the feeding was observed to be longer than usual. As the chick matured, the feeding trips became more frequent, with parents returning with large insects such as katydids, grasshoppers and mantids every 20–45 minutes (Figs. 5 & 6). Chestnut-bellied malkohas are mainly insectivorous birds with a preference for large insect prey hiding in the foliage of trees, where these birds hunt and can be observed creeping along branches with their bodies held closely to the branches. This species has also been known to feed on small reptiles as well as fruits on occasion. During feeding, only one parent was observed at the nest, while the other parent was noticed waiting in the nearby trees (Fig. 7).

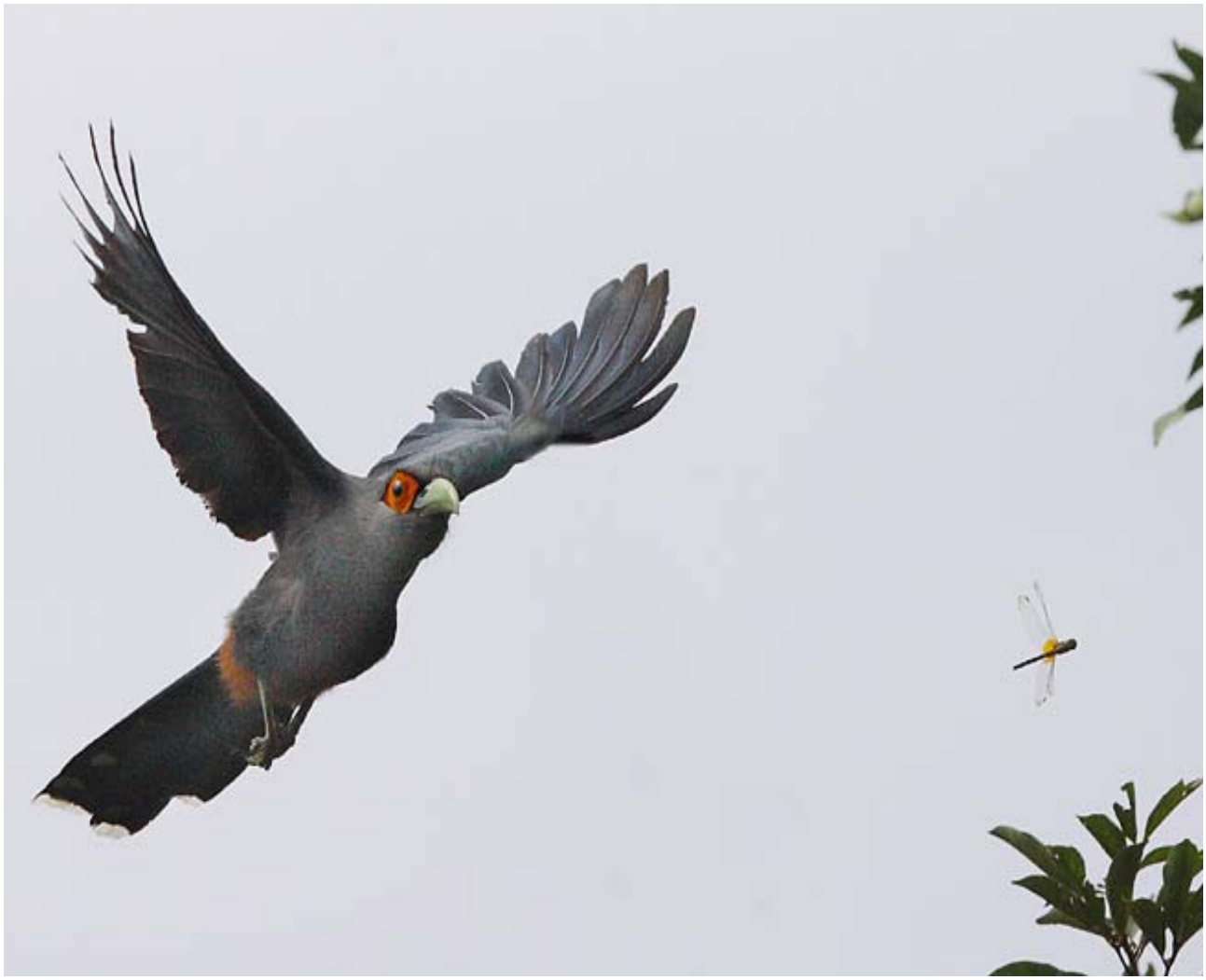

Fig. 4. Chestnut-bellied malkoha parent leaving the nest after a feeding trip. (Photo by: Lee Tiah Kee).

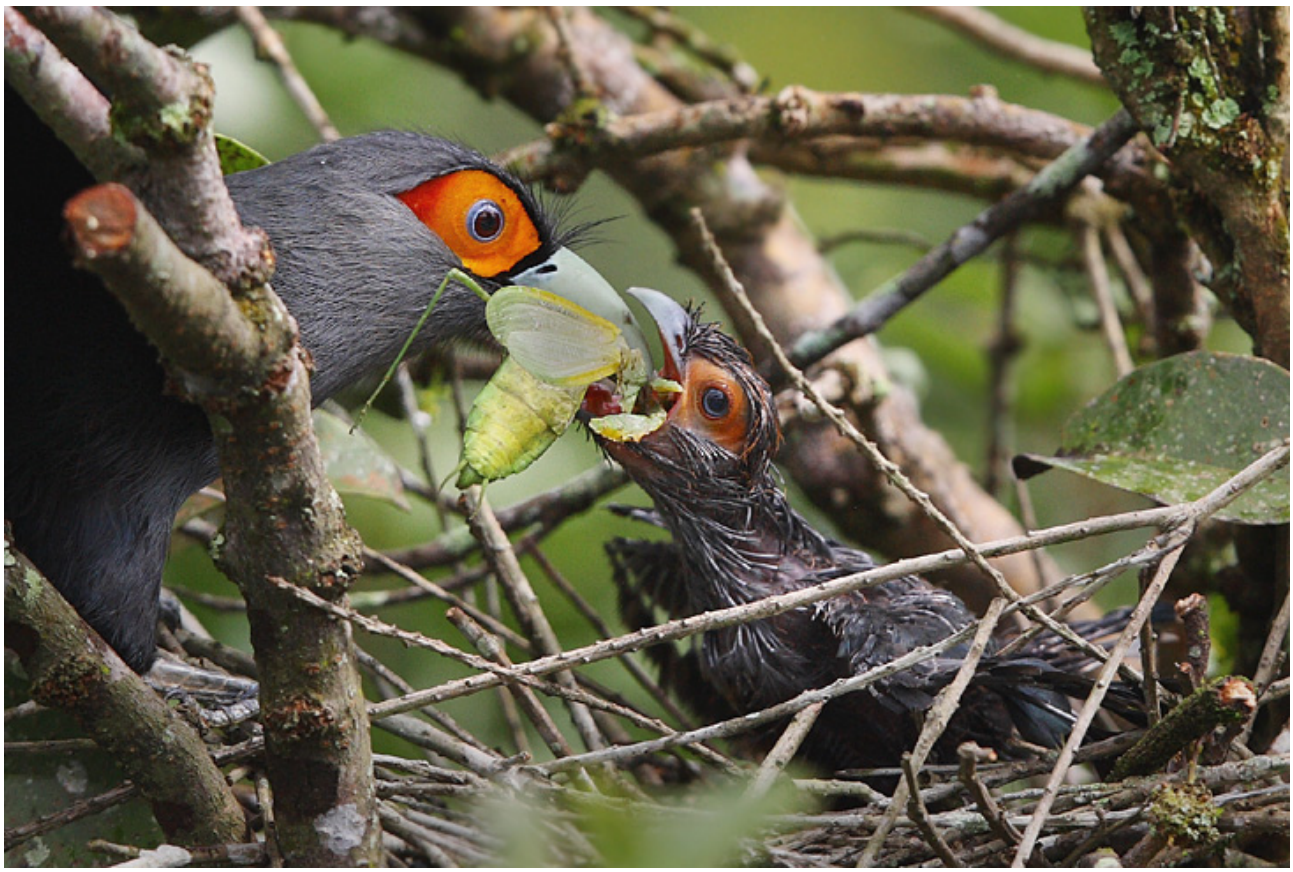

Fig. 5. The chestnut-bellied malkoha parent offering its chick a praying mantis. (Photo by: Lee Tiah Kee).

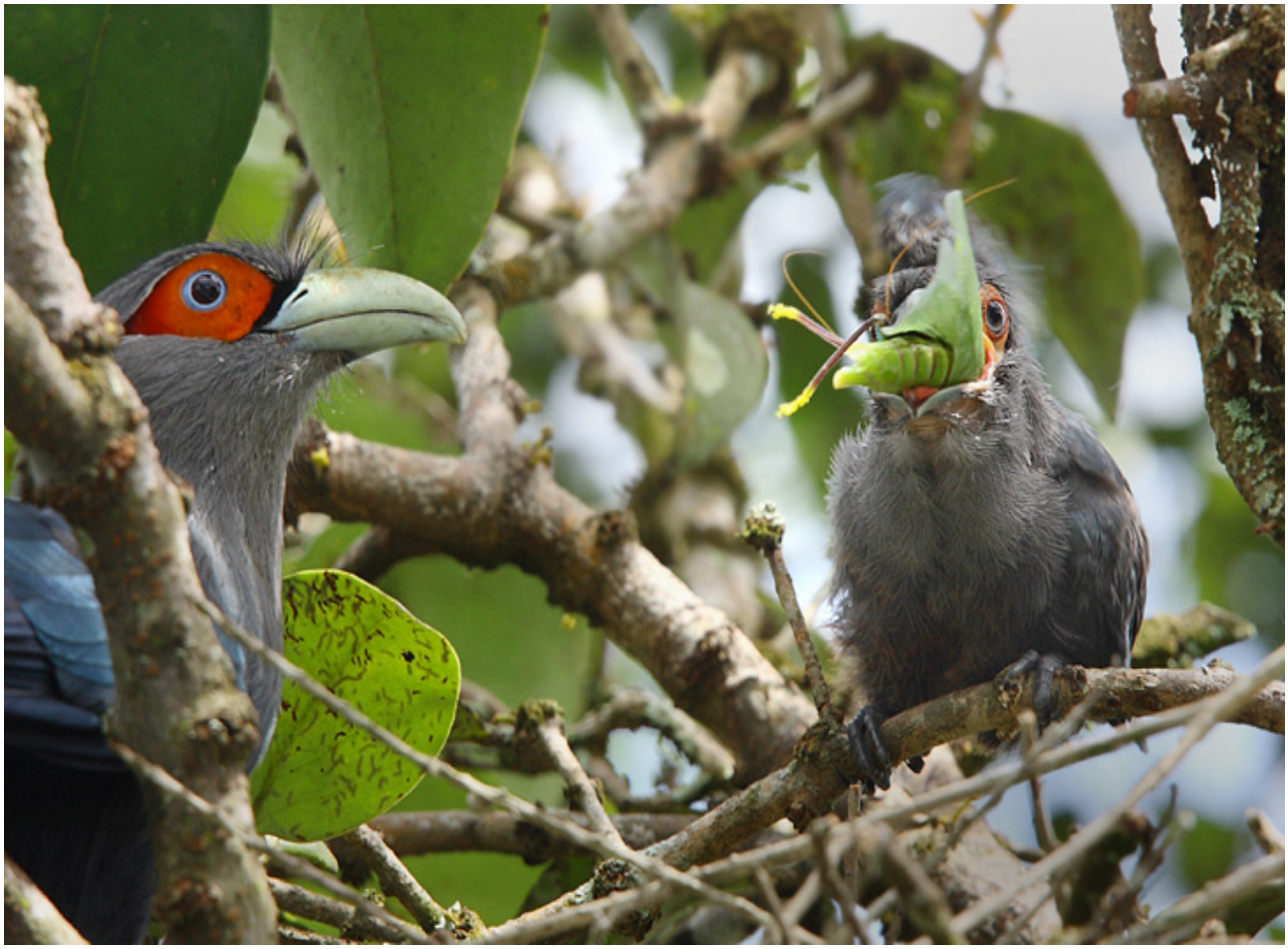

Fig. 6. The chestnut-bellied malkoha parent having offered its chick a katydid. (Photo by: Lee Tiah Kee).

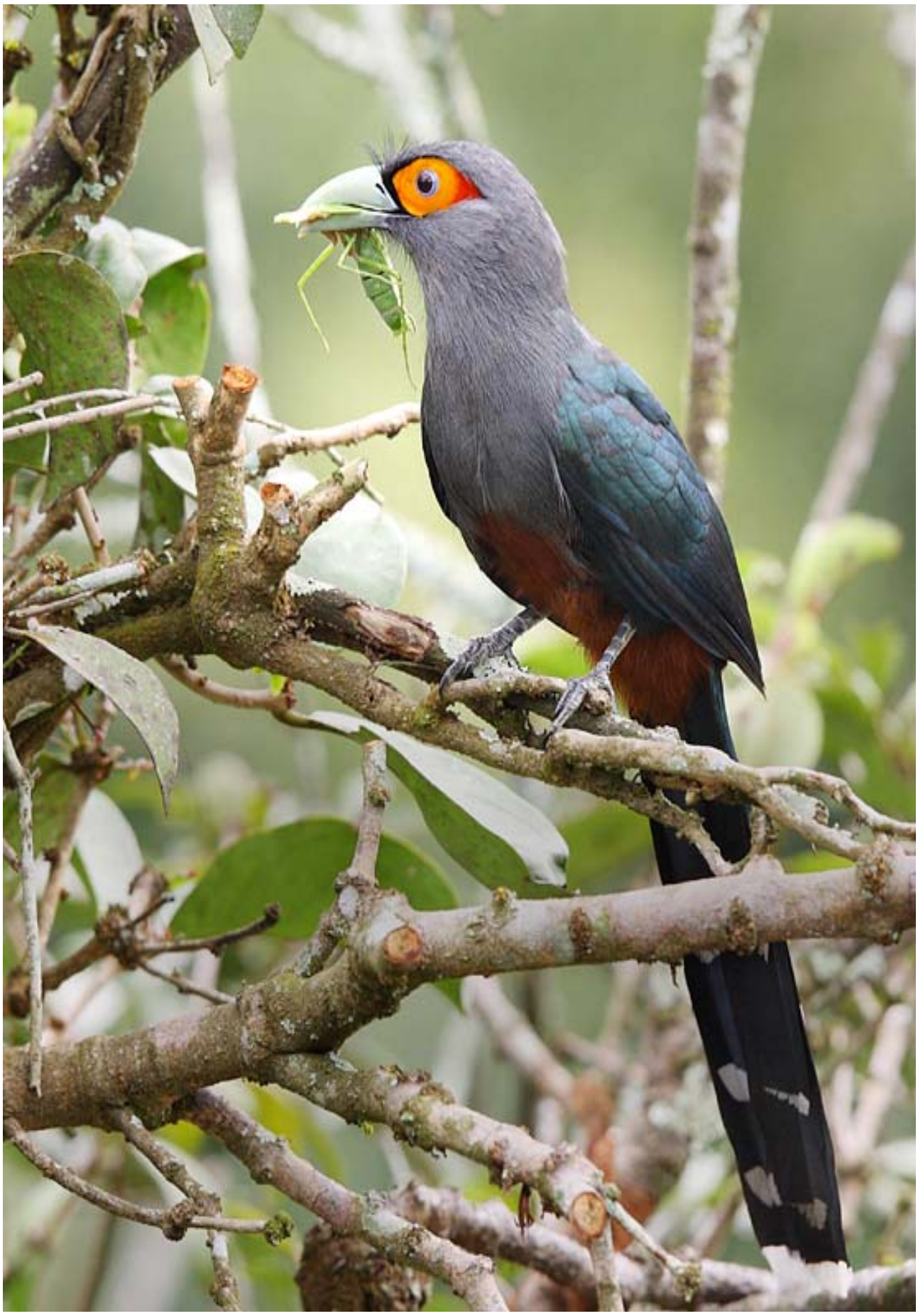

Fig. 7. A chestnut-bellied malkoha parent, with a mantis in its beak, in a nearby tree, waiting for the other parent to leave the nest. (Photo by: Lee Tiah Kee).

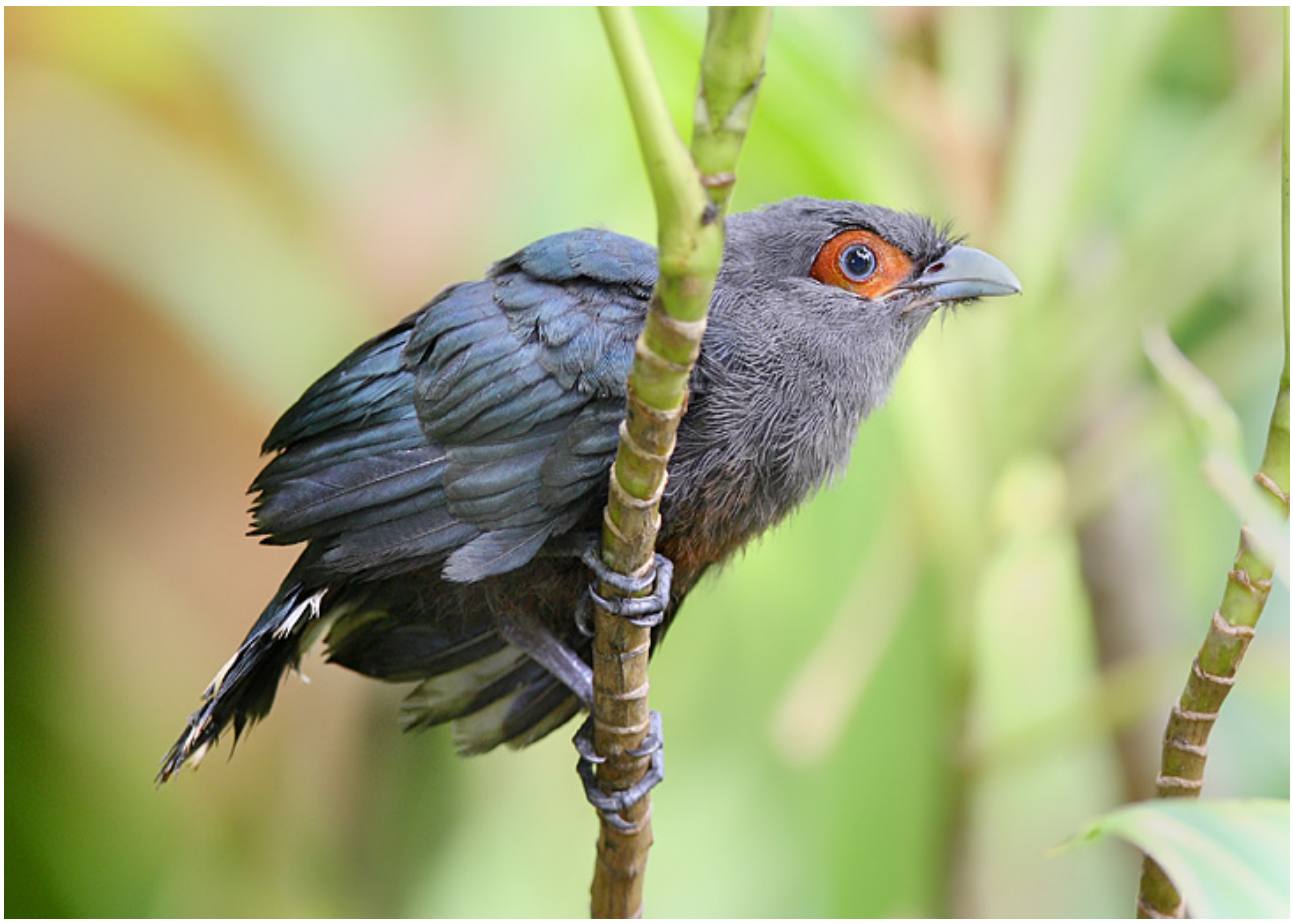

Fig. 8. The chestnut-bellied malkoha chick perched on a *Cordyline terminalis* plant stem after having left the nest. (Photo by: Lee Tiah Kee).

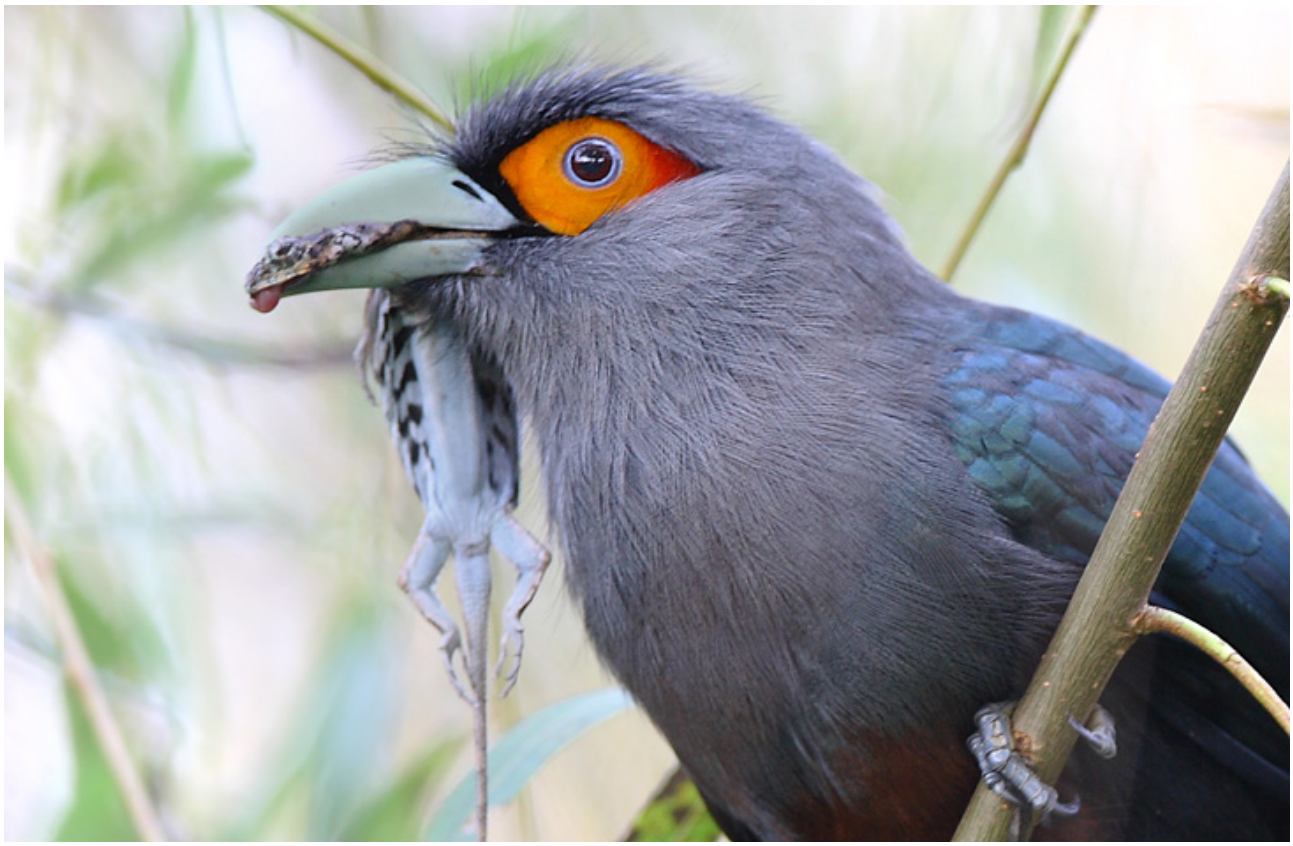

Fig. 9. A chestnut-bellied malkoha parent returning to its chick with a Sumatran flying dragon (*Draco sumatranus*) in its beak. (Photo by: Lee Tiah Kee).

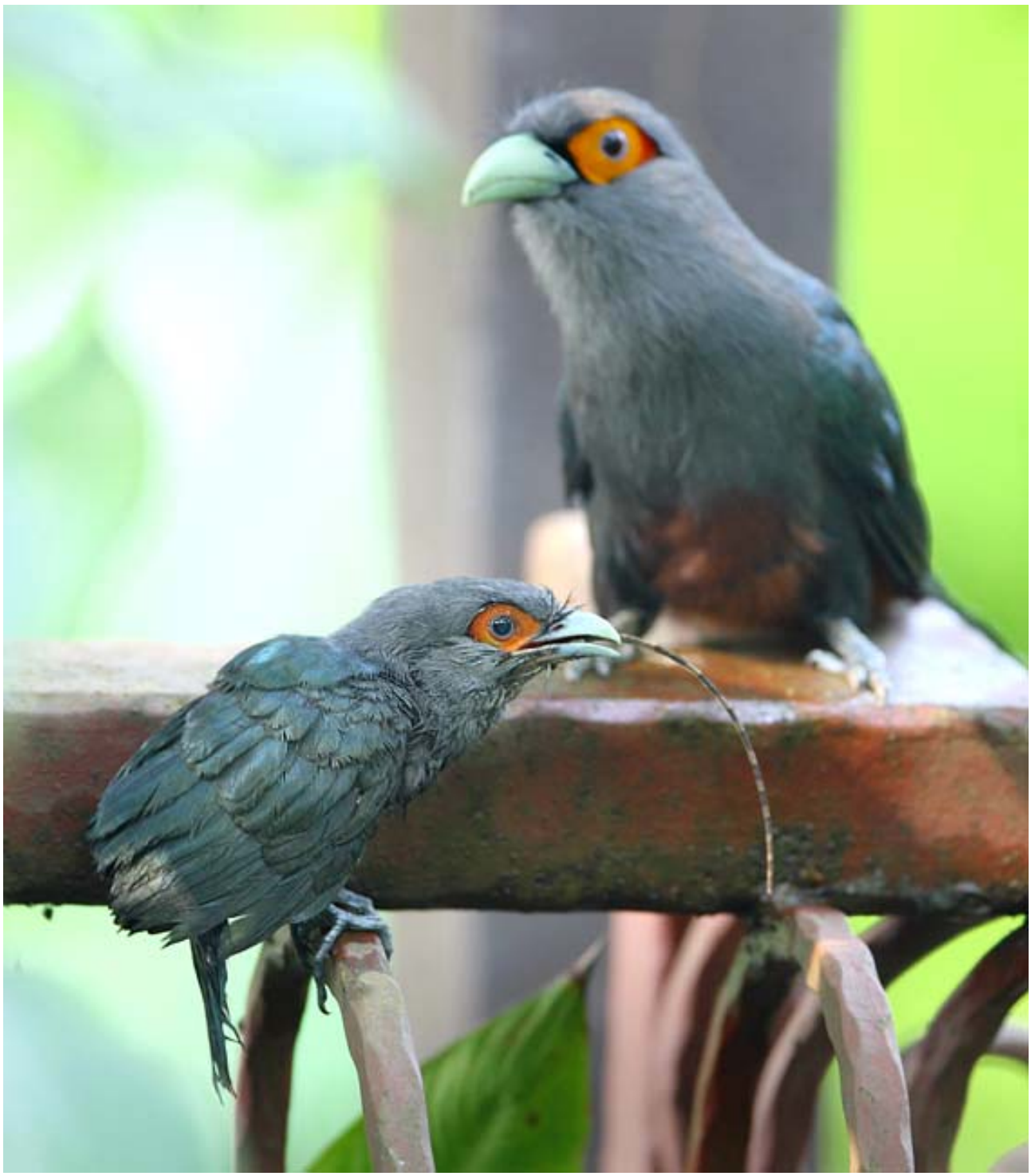

Fig. 10. The chestnut-bellied malkoha chick swallowing a Sumatran Flying Dragon (*Draco sumartanus*) whole. (Photo by: Lee Tiah Kee).

On 26 Aug.2008, the chick was observed hopping around the nest area, and was still being fed by the parents. On 27 Aug.2008, the chick was noticed to have made its way to the ground, hopping around low foliage plants in the area (Fig. 8). On one of the feeding trips, one of the parents returned to the chick with a Sumatran flying dragon (*Draco sumatranus*) (Fig. 9), which the chick devoured whole (Fig. 10).

After the Sumatran flying dragon meal, the parents did not return to the chick for many hours, and the chick was observed to have moved by itself into the thick vegetation and was not seen again. This was also reported by Kameda (1999), who assumed that the chicks had fledged when the Raffles' malkoha parents did not return to the chicks with food. This assumption was based on the fact that both chicks were fully feathered when the alleged abandonment occurred. We however do not know if the parents abandoned the chick after feeding it its final meal, or if the feeding just carried on in thicker vegetation close by where the birds felt safer. It was also noticed that once the chick had left

the nest, both parents became more skittish and wary of human presence. Observations and photography then had to be made from a further distance, so as not to disturb the parents and chick. The initial nesting photographs were made with a 70–200 mm lens but later a 600 mm lens was used.

CONCLUSIONS

Because the chestnut-bellied malkoha is the only known extant malkoha species in Singapore, since the very similar but slightly smaller black-bellied malkoha, reportedly went extinct in the 1960s (Wang & Hails, 2007). The fate of the chestnut-bellied malkoha may possibly be as bleak as that of its extinct counterpart. Examination of the black-bellied malkoha's habitat requirements and diet can provide us insights into the future success of the chestnut-bellied malkoha in Singapore. When comparing these two species, the similarities are alarming. Like the chestnut-bellied malkoha, the black-bellied malkoha is seemingly also a versatile species with respect to habitat requirements and is able to exploit secondary forests and usually occupies the mid- and upper canopy strata (Robson, 2005). Both species also belong to the insectivorous-carnivorous feeding guild (Castelletta et al., 2000) and are both relatively large forest birds (30–45 cm long) (Robson, 2005). According to Castelletta et al. (2000), the most vulnerable feeding guild during the post World War II extinctions in Singapore was the of the insectivorous-carnivorous feeding guild, to which the chestnut-bellied malkoha belongs, along with the extinct black-bellied malkoha. Their relatively large sizes also mean these birds require larger insects in order to sustain themselves and raise a successful clutch of young. In Singapore these large insects are becoming rarer and it is not known if fumigation at forest fringes to control the *Aedes aegypti* mosquito (to control dengue outbreaks) has any effect on larger insects, on which these birds feed.

The future of this species depends very much on the quality of its forest habitats, whether primary or secondary forest. Connectivity between forest patches is also another important factor as these forest dwelling birds have a limited flight range, and prefer travelling from tree to tree, creeping along branches rather than by flying. Large gaps between forested areas could isolate populations of these birds, rendering them unviable. Park connectors and green corridors may help these birds exploit isolated greenery such as parks and gardens.

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