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## Observations of Wetar Ground Dove *Gallicolumba hoedtii* from Timor-Leste (East Timor)

FRANK R. LAMBERT, COLIN R. TRAINOR and ALMEIDA F. XAVIER

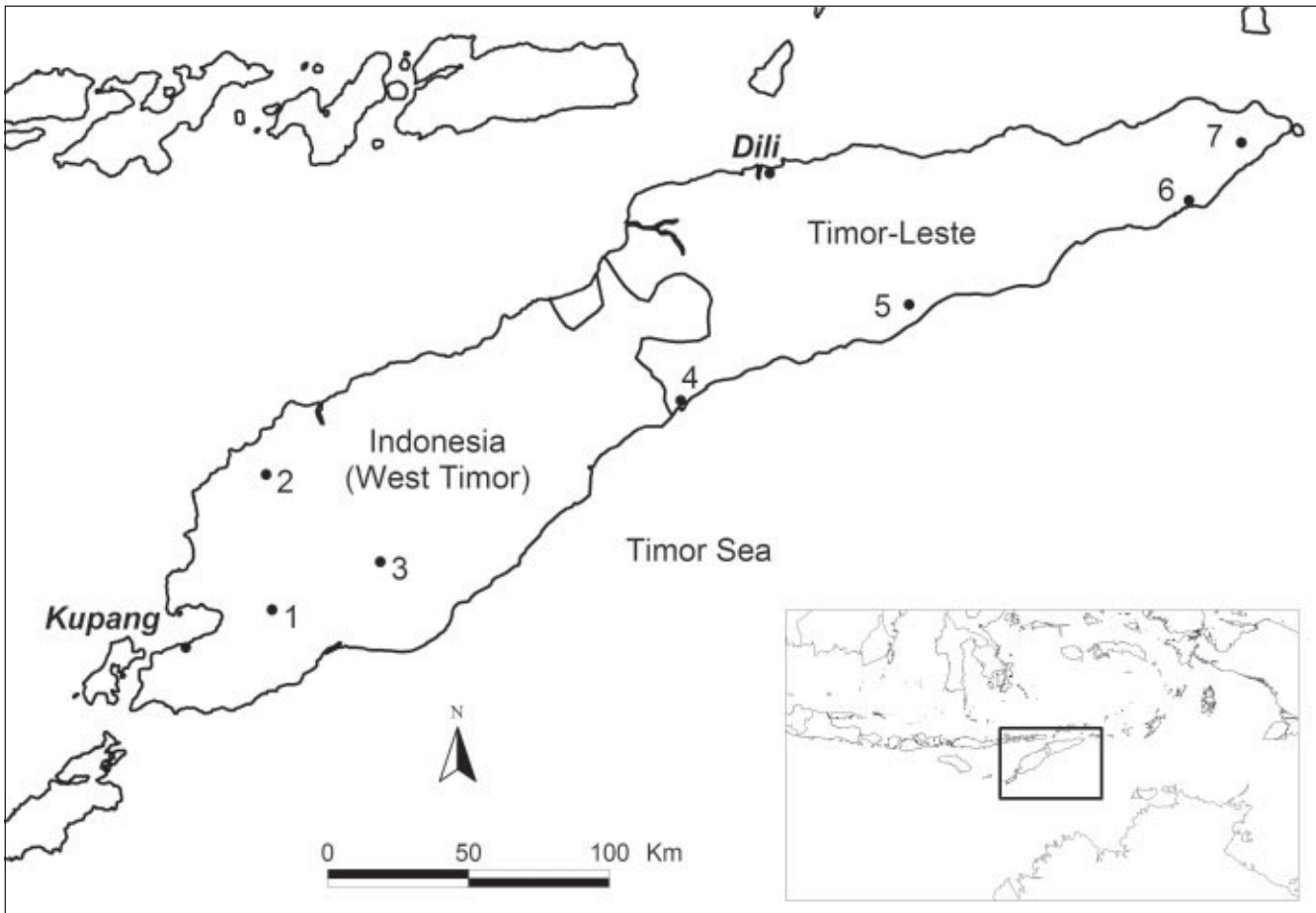
The genus *Gallicolumba* contains 20 species of largely terrestrial pigeons that are distributed through the western Pacific (Gibbs *et al.* 2001). Most of these are very poorly known owing to their retiring, elusive nature. Wetar Ground Dove *Gallicolumba hoedtii* is no exception and has long been considered as one of the most enigmatic of the 75 birds currently recognised as endemic to the Lesser Sunda islands of Indonesia (Coates and Bishop 1997, Dickinson *et al.* 2001, Olsen *et al.* 2002, Gershaug *et al.* 2004), where it is known only from Timor and Wetar. It is one of 24 bird species that are entirely restricted to the 'Timor and Wetar Endemic Bird Area' (Stattersfield *et al.* 1998, Dickinson *et al.* 2001). Paucity of data from the 17 specimens collected more than 100 years ago from unspecified localities on Wetar and one from west Timor (at Camplong or 'Tjamplong' in 1932: Mayr 1944), and from another three more recent (1972, 1993, 1999) brief and poorly substantiated sightings from Timor (Fig. 1) mean that its status, habitat requirements and ecology have only been speculated upon (e.g. Coates and Bishop 1997). A summary of all that was known of the species up until 2001 was provided by BirdLife International (2001), who considered the species to be Endangered.

In September 2004, the Ministry of Environment and Development of Timor-Leste (East Timor) confiscated a male Wetar Ground Dove from a bird trapper apprehended in Dili. The trapper apparently fled with the other birds, except one Slaty Cuckoo Dove *Turacoena modesta*, but which evidently included four more Wetar Ground Doves and one Slaty Cuckoo Dove. CT was able to confirm the identification of the male Wetar Ground Dove retained by the Ministry of Environment and



**Plate 1.** Male Wetar Ground Dove retained by the Ministry of Environment and Development and photographed before it was released locally, 7 September 2004 (photograph: C. Trainor).

Development, and photographed it before it was released locally (Plate 1). The bird trapper had claimed to have caught the birds on the south coast of Timor-Leste, in the Natarbora region (Manututo district). Based on the assumption that the bird had indeed come from somewhere in the south of the country, we decided to conduct a brief search for the species along the south coast of Timor-Leste, where little previous bird survey work had been undertaken.



**Figure 1.** Map of Timor showing locations mentioned in the text: (1) Camplong; (2) Gunung Timau; (3) Soe [Buat]; (4) Foho Lulik; (5) Natarbora; (6) Lore; (7) Fuiloro Plateau [Malahara].

## STUDY SITES AND METHODS

We searched for Wetar Ground Dove in three areas: (1) the vicinity of Foho Lulik village ( $9^{\circ}24'44''\text{S}$   $125^{\circ}07'21''\text{E}$ , 5 m; Tilomar sub-district), which lies along the main road that runs from Indonesia to Suai, some 5 km from the border. Satellite images from 2000 showed what appeared to be a significant area of tall, little-disturbed evergreen or semi-evergreen forest in this area: the habitat that we assumed that Wetar Ground Dove probably preferred. It was also an area that has never been visited by ornithologists in recent times, if at all. Recent surveys undertaken by CT and BirdLife International (Mauro 2003, Trainor *et al.* 2004) had all concentrated on forested areas to the east of Ainaro district. We undertook surveys at this site during 1–6 May 2005. (2) Lore ( $8^{\circ}40'06''\text{S}$   $126^{\circ}57'56''\text{E}$ , 3–70 m), c.220 km to the east of Foho Lulik, was visited during 9–12 May 2005. It comprised a mosaic of tall coastal evergreen forest patches and cultivated gardens on the south coast, where spring-fed streams ran through some of the forest. (3) Malahara ( $8^{\circ}28'33''\text{S}$   $127^{\circ}10'42''\text{E}$ , 330–430 m), on the Fuiloro Plateau, near Lake Iralalero was visited during 14–15 May 2005. The habitat here comprised logged secondary forest (330 m) with recent cultivated clearings, and adjacent tall primary evergreen forest at 330–430 m on rugged karst slopes (c.240 km east of Foho Lulik). The primary forest had minimal structure with limited development of understorey trees or shrubs and with few lianas and epiphytes.

At Foho Lulik, the vegetation structure and floristics was examined in five 0.1-ha plots (within a 20 m radius of a central point every 100 m along a 500 m transect) to compare the two dominant vegetation types (gallery tropical evergreen forest, and tropical dry deciduous forest on a limestone plateau). The diameter at breast height (DBH) of each tree greater than 10 cm diameter was measured, its height estimated and local names transcribed (in Timor-Leste *Bunak* and *Fataluku* languages, where possible). A plant collection was taken and will be identified at the Northern Territory Herbarium (Australia), but this information is not yet available (local names are given in Table 1).

## RESULTS

At Foho Lulik, local guides recognised several pigeon species depicted by Coates and Bishop (1997) that occurred in the area, but not Wetar Ground Dove, even when shown photographs of the captive male photographed by CT. Nevertheless we carried out searches for the species by quietly proceeding along forested tracks whilst focusing on terrestrial birds, and listening for unknown calls that could be made by *Gallicolumba* doves. Such a call was heard on the first evening, but not pursued because of lack of time. However, on 2 May 2005, FL returned to the area, heard the call again, and obtained a tape recording. The bird was calling from a concealed perch high in the canopy along a belt of remnant forest along a stream, but

could not be located. Using playback, however, FL lured the bird onto a more open branch where its identity as a male Wetar Ground Dove was clear. The bird (Male A) stayed in this area (9°24'25"S 125°06'57"E, 20 m) for more than a minute before flying off. Later that morning, CT and AX were also able to view this individual, since it was still calling again in the same area.

Two other birds were observed well enough to confirm their identification: (1) a female on 3 May seen in the subcanopy, c.18 m off the ground, and close to where Male A had been calling; and (2) an unsexed bird that was seen on 3 May flying off from a perch where it had been calling on a dry slope about 100–120 m from the male. It had been calling from c.12 m above the ground in the dense canopy of a c.14 m-high tree, the tallest in the vicinity, and rising above the surrounding degraded vegetation.

Wetar Ground Doves have a distinctive appearance and were readily identified with reference to pictures in Coates and Bishop (1997), and CRT's photographs of the male. The male had: a light grey head; buff neck, chest and belly (shown as cream in Coates and Bishop 1997); and rich rufous wings and tail. The iridescent purple shoulder-patch was more dispersed and less contrasting than shown in Coates and Bishop (1997). The female had a rich rufous cap, light throat and was more uniform chestnut in colour than the male. The only possible confusion species is the similar-sized and -shaped Emerald Dove *Chalcophaps indica*, but this species has green wings and light brown head and underparts.

Knowing the call, we were able to listen for other Wetar Ground Doves in this area, and to use tape playback to try to stimulate calling in areas where we did not hear calls. Owing to security considerations, we were unable to undertake extensive surveys in the area, but CT was able to briefly survey the forest remnants along the stream for a distance of about 700 m. In total, at least four, and perhaps five Wetar Ground Doves were heard calling along this part of the stream (within about 100 m of the stream itself).

On three different mornings (before 10h00), for a total period of about 10 hours, we also surveyed along c.2 km of the forested part of the well-used trail to Tilomar. The forest along the trail is tall and relatively untouched deciduous forest, and lies on the limestone plateau (at c.70–230 m) immediately to the north-east of the valley in which Wetar Ground Dove was found. The taller trees in this area of forest reached heights of at least 30 m, and there was no evidence of recent cutting of taller trees for timber. Whilst other species of pigeon (Pink-headed Imperial Pigeon *Ducula rosacea*, Slaty Cuckoo Dove, Barred-necked Cuckoo Dove *Macropygia magna*, Rose-crowned Fruit Dove *Ptilinopus regina* and Black-backed Fruit Dove *P. cinctus*) were calling in this area of forest, we did not hear Wetar Ground Dove during our early morning surveys.

Our brief searches, using the same methods (including playing of the call) in forested areas at Lore and near Lake Iralalero were not successful. No calls of the species were heard in either area, and a few local people who were questioned about Wetar Ground Dove did not recognise it when shown photographs, although they recognised pictures of other pigeons present in the area.

### Behaviour

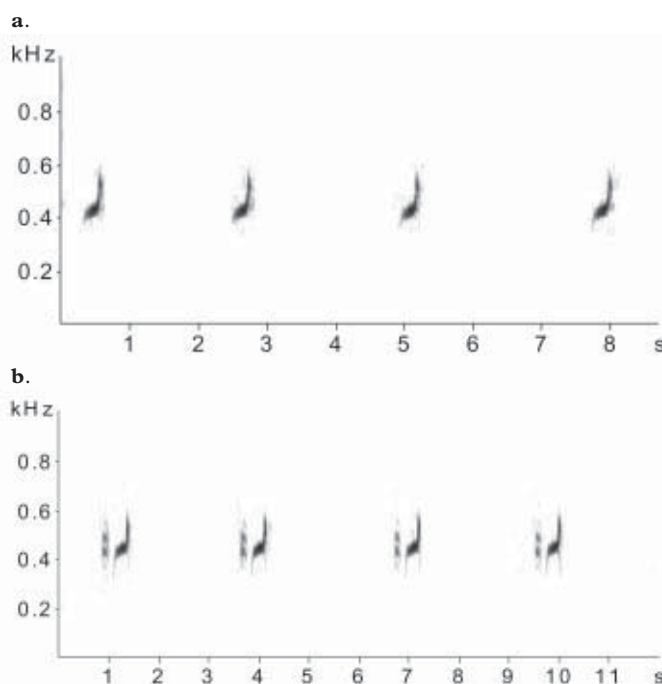
Wetar Ground Dove is evidently an inconspicuous species. Local people whom we talked to did not know the species,

with the possible exception of one hunter; in addition, we only saw birds when they were calling.

Most of our observations relate to Male A. This bird consistently called from the same area, in the canopy at 18–22 m in trees c.25 m tall. Typically it appeared to call from within or just below dense parts of the canopy, particularly in places where the leaves of vines made the canopy more dense than usual. On three occasions it was seen calling: twice it was on a more-or-less horizontal branch about 6–8 cm in diameter. On the third occasion it called only once, from a branch in a fairly open tree (see below). When calling, it lowered its head momentarily at the beginning of the call, and appeared to puff up its chest.

Three different calls were given. The most typical call was a short and soft two-note *whu-wup* or *du-wup* given at 2.0–2.5 sec intervals (Fig. 2a). It was occasionally preceded by another syllable: *du du-wup* (Fig. 2b), or followed by a brief guttural *trrr*. This suffix was often not as audible as the other two notes from further away; we were unable to produce a sonagram showing it. After tape playback of any of the calls, the male always responded with this three-note call. Occasionally, birds would start giving this call, but then change to the slightly quieter two-note version. The *du-wup trrr* call, at least, may be territorial, since on a number of occasions initiation of this call by one bird resulted in an immediate response of the same call by one or two neighbours. Only Male A was seen calling, so it was never ascertained whether or not females call.

We obtained no evidence for terrestrial habits by the species, since all of our observations were of birds calling from the canopy. Even when seen in flight, which happened on at least ten occasions, Male A was usually high above the ground. In contrast, Emerald Doves were regularly seen flying through the area c.3–5 m off the ground. Most observations of Wetar Ground Doves in flight were of birds at about 10–18 m above the ground. The lowest sighting was c.6–7 m off the ground, when



**Figure 2.** Sonagrams of calls of Wetar Ground Dove from recordings made in May 2005 near Foho Lulik, Timor-Leste (sonagrams prepared by British Library Sound Archive, where the recordings are archived).



Male A landed briefly close to FL at 08h20 on 5 May 2005. On this occasion, it had a short piece of dried vine twig (identified by the presence of a section of curled tendrils) in its bill, which it subsequently took to a high location (c.23 m) in the canopy, directly above the stream: evidently a nest site.

After this, Male A called a few times from nearby, and then dropped onto a fairly obvious perch in the canopy of a *Peltophorum pterocarpum* (Fabaceae), a tree species in which it was seen perching on several occasions. There, it gave the three-note call after a few minutes, and then sat still until 09h13. At 09h14, having moved within the same tree, it gave a single three-note call, and this was immediately answered by two three-note calls from what was judged to be its nearest neighbour, some 100–120 m away on the slope above the valley. This bird had been calling intermittently during the morning, from at least 07h00, as had another bird further up the stream. It seems likely that other birds may have been calling within hearing distance of the bird, further up the valley: we could hear the calls of Wetar Ground Dove, at ground level, from a distance of at least 200 m.

At 9h17, Male A moved out of view and gave a few calls, being answered by its two nearest neighbours, which both gave three-note calls. One bird then gave a two-note call. From 09h30 to 09h40, Male A was calling again near the nest site, with about 30 seconds between each call, whilst its nearest neighbour answered occasionally. At 09h44 it visited the vicinity of the nest (though whether with nest material was not ascertained), and stayed hidden in that area until 09h57, when it moved to an exposed branch in the adjacent subcanopy before flying off downstream at 09h58. Two-minutes later it was back in more-or-less the same subcanopy location, where it gave two three-note calls before flying in a low downward arc, downstream, whilst giving three wing-claps.

At 10h10 am, Male A returned again to the subcanopy near its nest site holding in its bill a thin, forked twig c.5 cm long. It took the twig to the same area of the canopy as at 08h20. At 10h23, Male A was calling from a hidden location near its nest, with gaps of 3–5 seconds between calls. Its whereabouts then became uncertain until 10h48, when it gave one call from nearby, and then again at 11h12, when it started calling more regularly. At 11h16, it made five wing-claps (loud claps audible for c.50 m, but we did not note whether this noise was made during contact of the wings from above or below) near the nest and then disappeared. FL left the area at this time, but returned at about 16h00. No calls were heard near the nest site, however, until about 17h20, when a bird started calling very regularly from a perch nearby at a rate of 19–21 two-note calls per minute. This is assumed to have been Male A, based on location, but not verified. Calling finished at about 17h40, just as the sun set. During this period, calling had been regular from the territory of its nearest neighbour, which started calling earlier and finished slightly later. On 4 May 2005, calling from Male A's territory started earlier in the afternoon, at about 16h25.

Male A's nest was never observed directly, but its location was determined to within 1–2 m. It was in the upper canopy of a *joil* tree (O. Berek verbally 2006) where the leaves of a liana (*Entada phaseoloides*; Fabaceae) made the canopy particularly dense.

Wing-clapping consisting 3–5 clearly audible claps attributed to Male A was heard on four occasions, although

**Table 1.** Floristic and structural characteristics of gallery rainforest (where Wetar Ground Dove was recorded) and tropical dry forest (where it was not recorded) at Foho Lulik, Timor-Leste. Local tree names are indicated in parentheses. Significance of Mann-Whitney *U*-test: \*\* $p < 0.01$ , \*  $p < 0.05$ , ns = not significant.

Variable	Gallery evergreen forest (n= 5)	Tropical dry forest (n= 5)	Z value
No. stems/0.1 ha	31	19	2.19*
Mean no. trees per plot	15.6	10.8	2.01*
Basal area (cm <sup>2</sup> )	1001	562	2.61**
Mean tree height (m)	11.2	10.7	0.31 ns
Ten most frequently occurring trees (numbers are mean number of stems per 1 ha plot):			
( <i>joilkujo</i> )	15	10	
Sapindaceae sp. ( <i>ebi</i> )	16	0	
<i>Pouteria ?nitida</i> ( <i>johil</i> )	10	6	
<i>Vitex</i> sp. ( <i>gonohowel</i> )	1	14	
( <i>sis</i> )	8	6	
<i>Barringtonia racemosa</i> ( <i>lamusakujo</i> )	10	2	
( <i>lamusa</i> )	6	5	
( <i>siva</i> )	11	0	
<i>Buchanania arborescens</i> ( <i>kahn</i> )	10	0	
<i>Flueggia</i> sp. ( <i>elok</i> )	9	0	
( <i>goho ohobel</i> )	0	9	

it was only observed once. On this occasion, it clapped its wings as it flew in a shallow downward arc along the line of the stream, clapping the wings directly below the nest location.

### Habitat description

During our brief survey in the vicinity of Foho Lulik, we only encountered Wetar Ground Dove in the remnant forest trees bordering a 3–4 m wide, clear, meandering, spring-fed stream, and from a location c.100 m distant from the stream on the drier slope above the alluvial plain. The vegetation in this area was a mosaic of different habitats, including tall grass in large clearings, but remnant tall trees and narrow strips of gallery evergreen forest patches (with a canopy height of 25–35 m) bordered the stream along most of its length. We did not encounter the species in nearby drier tropical dry deciduous forest on limestone. There were substantial differences between the two habitats: gallery evergreen rainforest had significantly greater basal area (44% more than tropical dry forest), more stems (39%) and more tree species per plot (31%) (see Table 1). A total of 252 individual trees of 52 species were recorded in the ten plots, with substantial differences in tree species composition between the two habitats. Eleven tree species composed more than half of the recorded stems. There was little difference in mean tree height between the two habitats, but overall the canopy of gallery rainforest averaged 30 m and that of tropical dry forest averaged 23 m.

### DISCUSSION

Almost nothing is known about any aspect of the habitat requirements of Wetar Ground Dove. This is partly because no locality or other data are available for the

original 19 specimens from Wetar (BirdLife International 2001). All that is known about the Timor specimen collected by Georg Stein in January 1932 comes from Mayr (1944), who had to construct Stein's itinerary from the meagre data on the labels. Stein was evidently collecting at Camplong (c.35 km east of Kupang, West Timor) at the time he obtained the immature male Wetar Ground Dove, although this does not necessarily mean that the specimen came from there, since he could have purchased it from bird trappers or hunters. However, assuming that the specimen was from Camplong, it is interesting to note that this area shares some habitat characteristics of our Foho Lulik site. At c.160 m altitude, Camplong has areas of spring-fed streams lined by tall evergreen trees, surrounded by tall tropical deciduous forest dominated by *Tamarindus indica* (CT personal observations).

More recent claimed sightings, which are very poorly documented and difficult to verify, are all from significantly higher altitudes. The first was of a bird seen near Same, Timor-Leste, by M. Bruce in August 1972, though the record lacks any details (White and Bruce 1986). Same town is at about 500 m and is one of the wettest recorded regions on Timor, with rainfall of 3,100 mm/yr (RePPProT 1989) and many springs and perennial streams (CT personal observations). In July 1993, R. Noske flushed what he considered to be a Wetar Ground Dove from the ground c.5 km from Soe (Buat forest) in the mountains of West Timor at 950 m (Noske and Saleh 1996, BirdLife International 2001). D. Lesmana reported seeing the species four times at 600 m and once at 900 m at Kolabe on Mt Timau (c.60 km north-east of Kupang, West Timor) in May 1999 (Lesmana *et al.* 2000). Despite the significance of the records, Lesmana failed to note the sex of the individuals seen, and the only recorded information relating to these sightings is contained in an Indonesian-language report (Lesmana *et al.* 2000). In this, Lesmana stated that five birds were observed in heavily degraded forest (with 'plants the height of a house') where they were eating the seeds of *damar merah* in the trees and on the ground. The trees were also being used by Slaty Cuckoo Dove. He identified *damar merah* as *Macaranga* sp. Although not specified clearly in the report of Lesmana *et al.* (2000), BirdLife International (2001) noted that Lesmana's 900 m sighting was in moist semi-deciduous forest (citing 'Lesmana verbally'). Interestingly, the map of vegetation cover for West Timor shown in Lesmana *et al.* (2000), which is based on WCMC (1996), appears to indicate that the only semi-evergreen forest remaining in western West Timor occurs on Mt Timau. Apart from the different elevation, this tropical forest type, with a high proportion of evergreen trees growing to 25–35 m in height, is similar to Foho Lulik in terms of forest structure and degree of deciduousness.

The persistent calling of Wetar Ground Dove from at least two spots at Foho Lulik throughout our stay, and the collection of nest material by one male, clearly indicate breeding. Our observations suggest that the onset of breeding may be tied to the beginning of the dry season, but without further field data it is not possible to say more about breeding seasonality. It also seems possible that breeding is associated with permanent water derived from springs. If Wetar Ground Dove is a dry-season breeder, then this may be unusual on Timor, since Noske (2003) presented evidence to suggest that egg-laying by land

birds occurs throughout the wet season (November–April), possibly peaking in November. Nevertheless, during our brief visit to Foho Lulik, we noted breeding behaviour by several other species in the vicinity: Slaty Cuckoo Dove was seen displaying; Tawny Grassbird *Megalurus timorensis* and munias *Lonchura* sp. were seen collecting nest material; and a Spotted Dove *Streptopelia chinensis* was observed sitting on a nest.

Our brief surveys suggest that Wetar Ground Dove could be a locally common breeding species in certain riparian forests where there are spring-fed streams, such as at Foho Lulik. However, our failure to find the species at the two other sites with similar habitats suggests that its habitat requirements may be highly specialised. One notable difference between the sites visited was that the mosaic of habitats along the stream floodplain and adjacent rocky (limestone) slopes at Foho Lulik contained significant areas that were dominated by bamboo. Perhaps, therefore, this is a key component of the habitat for the species. One other restricted-range species in Timor-Leste—Tricoloured Parrot-finch *Erythrura tricolor*—seems often to be associated with bamboo, while some populations of White-bibbed Ground Dove *Gallicolumba jobiensis* of New Guinea and some of its satellite islands are reported to be nomadic and to move into areas of seeding bamboo (Gibbs *et al.* 2001). All other restricted-range forest species on Timor can be found in a variety of forest habitats, including dry forest (Noske and Saleh 1996, Stattersfield *et al.* 1998, Trainor *et al.* 2004).

While few species of *Gallicolumba* are well known, there can be little doubt that the majority are highly terrestrial. With the exception of White-throated Ground Dove *G. xanthonura* of the Mariana Islands and Yap, all other *Gallicolumba* species are believed to be primarily terrestrial, although the Mindoro Bleeding-heart *G. platenae* was once reported feeding on figs with *Treron* sp. pigeons (Collar *et al.* 1999, Gibbs *et al.* 2001). Furthermore, of nine of the 20 species for which the nest is known in the wild, all apparently nest close to or on the ground (Gibbs *et al.* 2001, Slade *et al.* 2005). In these respects, Wetar Ground Dove may be unusual, since our observations suggest that they spend a considerable time high in the canopy (males, during the breeding season, at least), and furthermore construct their nests there.

The fact that only one Wetar Ground Dove specimen has been collected on Timor island from a total of more than 2,000 bird specimens suggests that the Wetar Ground Dove has always been quite rare (Mayr 1944: 1,354 bird specimens collected by G. Stein; Hellmayr 1914, see White and Bruce 1986: 400 bird specimens; and J. McKean and I. Mason in White and Bruce 1986: 281 bird specimens). The observation that the Timor specimen was collected at Camplong, but is clearly no longer present at the site, is the only direct evidence of decline in this species. We feel that it would be premature to attempt to discuss the conservation status of Wetar Ground Dove on Timor based on our limited observations. However, it is striking that Wetar Ground Dove is absent from Lautem district, which retains by far the most intact set of tropical forest landscapes (c.500 km<sup>2</sup>) on Timor. More surveys are needed for the species along the central south coast of Timor-Leste (and perhaps Mt Timau in West Timor) and on Wetar island.

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# A taxonomic reappraisal of the Black-browed Barbet *Megalaima oorti*

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As commonly treated (e.g. Peters 1948, Cheng 1987, Clements 2000, Short and Horne 2001, 2002, Dickinson 2003), Black-browed Barbet *Megalaima oorti* consists of five widely disjunct subspecies: *M. o. nuchalis* on Taiwan, *M. o. sini* in southern mainland China, *M. o. faber* on

Hainan, *M. o. annamensis* through parts of eastern Indochina (Cambodia, Laos, Vietnam), and *M. o. oorti* in Peninsular Malaysia and Sumatra (see Fig. 1; note that Robson [2000] also lists nominate *oorti* for extreme southern Thailand). In terms of plumage morphology,