

## Supplementary notes on some birds of Lore Lindu Reserve, Central Sulawesi

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From a sound-recording expedition to Lore Lindu Reserve, Central Sulawesi, Indonesia, in July-August 1984, notes are provided on the occurrence, altitudinal distribution, nesting season and/or vocalisations of 34 bird species where data are at variance with or additional to previous work. Two species, *Falco peregrinus* and *F. severus*, were new to the area. The occurrence of *Serinus estherae* on Mt. Rorekatimbu was confirmed, and its plumage found to differ from other populations. *Hieraaetus kienerii*, *Eurostopodus macrotis*, *Picoides temminckii*, *Ficedula westermanni*, *Eumyias panayensis* and *Myzomela sanguinolenta* were more widespread in altitudinal range, or more obviously abundant, than previously reported. Descriptions of vocalisations are given for 19 species. Nesting season data are given for nine species.

In July and August 1984, in Central Sulawesi (formerly Celebes), Indonesia, at Lore Lindu Reserve and its environs (c. 1°15' - 1°30'S 119°50' - 120°20'E), south-east of the provincial capital Palu, we made sound-recordings of 97 bird species for the collection of the Library of Natural Sounds (LNS), Laboratory of Ornithology, Cornell University, Ithaca, New York, USA. This paper presents a selection of our ornithological notes on occurrence, altitudinal distribution, nesting season and vocal behaviour, and is intended as a supplement to Watling (1983), to which one should refer for more information on the Lore Lindu Reserve and its avifauna, and which is followed in taxonomy, nomenclature, and delineation and classification (with capital first letters) of vegetation zones.

The notes are from the following localities (see Figure): *lower Palu river valley* (=LP), 0-200 m, secondary vegetation and agricultural fields at Palu and Lowland Rain Forest at Saluki (200 m); *upper Palu river valley* (=UP), 300-1,000 m, Lowland Rain Forest at Sidaonta along metalled road up from Saluwa (300 m) and along c. 4 km of footpath up to Lake Lindu; *Lake Lindu* (=LL), 960-1,000 m, secondary vegetation bordering rainforest at Tomado and Anca, along the shore of the 3,000 ha lake (see also Klapste 1982b); *lower Soppu river valley* (=LS), 650-850 m, Lowland Rain Forest and secondary vegetation at agricultural land, along c. 19 km of road and footpaths at confluence of Gumbasa river near Pertigaan Lindu, at Kamarora and at Tongoa (respectively km post 50, 57 and 62); *upper Soppu river valley* (=US), 850-1,800 m, Upper Lowland Rain Forest to Montane Rain Forest, along c. 18 km of the road to Napu, mostly at Dongi-dongi logging camp (km post 75, 990 m) and at pass south of Mt. Rorekatimbu (km post 89, 1,800 m); *Mt. Rorekatimbu* (=MR), 1,800-2,610 m, Upper Montane Rain and Moss Forest, along c. 9 km path to Anaso logging camp.

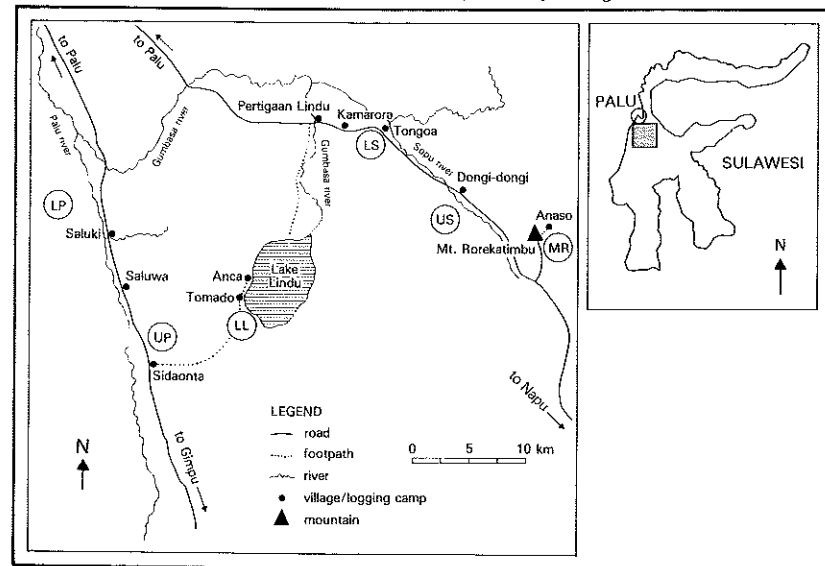
JERDON'S BAZA *Aviceda jerdoni* On 1 August, a few kilometres beyond Tongoa, and on 5 and 27 August, near Saluwa, pairs were seen in and above roadside forest.

In flight, probably both birds were calling, one at a higher pitch than the other, every 2 s a downward 'peeew' of 0.5 s duration. A recording presumably of this species was made at the first location (LNS 32933). This raptor was not noted by Watling (1983) but was mentioned for the area by Riley (1924).

**SULAWESI HAWK-EAGLE** *Spizaetus lanceolatus* This hawk-eagle was seen or heard on many days especially in Sopo river valley where it was even perching on buildings at the forest edge. The most commonly heard call was a continuous series of four to ten 0.5 s 'kluuu' notes, each note slightly lower in pitch, and each successive series on a slightly higher scale than the previous one. There was a 0.5 s pause between each series, preceded by a higher, rather more disyllabic starting note with a distinct upward inflection (LNS 32747, 32751). A slightly different call was also recorded: a fast series of c. 45 'kee' notes delivered over 9 s, only slightly varying in pitch and each note of 0.2 s duration, usually uttered when the bird was circling several kilometres up in the sky (LNS 32764). The song of perched birds consisted of series of 55 'kee' calls in 10 s up to 77 'kee' calls in 12 s with an upward inflection after one-third, and a downward deflection after two-thirds of each series (LNS 32900, 33008). On 28 July, at upper Sopo river valley, one such bird was observed while singing from a horizontal branch in the canopy of a tree above the river (LNS 32900). It called with bill wide open, and during the pauses between each series of calls it preened its feathers.

**BLACK KITE** *Milvus migrans* While Watling noted this species as common for Lake Lindu, we, surprisingly, did not find any kite other than the common Brahminy Kite *Haliastur indus*, in August.

**Figure.** Lore Lindu Reserve and its environs, Central Sulawesi, Indonesia, showing locations mentioned in the text.



**BRAHMINY KITE** *Haliastur indus* This kite showed a large altitudinal range, being present even at 2,400 m circling over Moss Forest near the top of Mt. Rorekatimbu.

**LESSER FISH-EAGLE** *Ichthyophaga humilis* On 8–11 August, at Lake Lindu, mostly at dawn and dusk, but also in late morning between 10h00 and 12h00, the song was heard and sound-recorded (LNS 32953, 32958, 32968, 32971). Three birds in immature plumage were seen daily at the lake. On 21 and 22 August, the song was also heard at Kamarora and Pertigaan Lindu on agricultural land near small rivers (LNS 33020). The song was a loud and far-carrying sequence of seven to 11 disyllabic 'kahAW' calls delivered over 6 to 10 s respectively, abruptly shortening at the end.

**SPOT-TAILED GOSHAWK** *Accipiter trinitatus* Sound-recorded on 16 August at Pertigaan Lindu, and on 28 August at Sidaonta (LNS 33013, 33089; identified by F. Rozendaal). It uttered five rhythmic 'ke' notes in nearly 2 s, each successive note slightly lower in pitch than the preceding, and the last notes more slowly delivered. This vocalisation was also described by Heinrich (Stresemann 1940). When calling the bird kept moving through the lower canopy never repeating it twice from the same spot.

**RUFIOUS-BELLIED EAGLE** *Hieraaetus kienerii* While Watling had only four sightings, all below 1,000 m, we found this species to be much commoner, and also at higher altitudes. On 20 August, two birds in display, one (still) in white immature plumage, were observed at 2,400 m on Mt. Rorekatimbu, producing a rising song of five or more syllables.

**PEREGRINE FALCON** *Falco peregrinus* On 22 August, at Kamarora, a small and dark Peregrine of the subspecies *F. p. ernesti* was seen in a 20 m high tree-top at the forest edge, feeding on a bird. This species had not previously been recorded from Lore Lindu (see Watling 1981).

**ORIENTAL HOBBY** *Falco severus* In the second half of July, three birds were present at Dongi-dongi. When perched in the highest tree-tops or chasing each other over the forest, these falcons were quite vocal, especially in the morning and evening, giving long series of high, slightly variably pitched, penetrating 'kleee' calls (five per second) (LNS 32771, 32790, 32803, 32810). These calls were also described by Coomans de Ruiter (1947). This species had not previously been recorded from Lore Lindu (see Watling 1981).

**MALEO** *Macrocephalon maleo* During July and August, birds were absent from the known nesting sites on volcanic thermal soil in Lowland Rain Forest at Kamarora and Saluki. Villagers said that eggs were laid from October onwards, indicating seasonal breeding.

**GREEN IMPERIAL PIGEON** *Ducula aenea* Apart from the frequently repeated, characteristic, rolling 'brrrup', certain other vocalisations were recorded, such as a plain shortish 'hoo' and more disyllabic variable cooings, e.g. 'koo koooo' (inflected downward at the end) and a questioning 'woohoo woo' (with upward inflection in the first syllable) (LNS 32999, 33011, 33012, 33014, 33016, 33050, 33053).

**YELLOW-AND-GREEN LORIKEET** *Trichoglossus flavoviridis* On 25 July, at 2,400 m in Moss Forest above Anaso, a nesting hole high in a dead tree was found occupied by two birds. This species was very common in Sopus river valley where large noisy flocks were seen moving fast through and foraging in tall flowering *Euphorbia* trees (LNS 32792).

**SULAWESI HAWK-CUCKOO** *Cuculus crassirostris* On 16 August, at Pertigaan Lindu, and on 22 August, at Kamarora, before or just after dawn, sounds of this species were recorded in secondary growth at the forest edge bordering agricultural fields. Birds were not seen, but the recordings agree with descriptions by Heinrich (Stresemann 1940). At the first locality, at 05h50, the song consisted of three cooing notes with a hardly audible fourth 'kO kO ku (ku)', lasting in total 1 s. The first two notes were rather similar, the third was softer and four semitones lower in pitch, and the fourth even softer and shorter (LNS 33010). At the second location, at 04h15 (before daylight) and 05h50, two different calls, probably of this species, were a two-note cooing, repeated every 8 s, the second note four semi-tones lower in pitch than the first, and a three-note cooing with each following note two semitones lower in pitch (LNS 33043, 33048).

**SPECKLED BOOBOOK** *Ninox punctulata* On the evening of 19 August, sound-recordings of this endemic owl were made in broken forest at c. 2,000 m along the road to Anaso. Its song consisted of 15 'toy' sounds on a rising scale accelerating slightly towards a kind of climax, after which a lower pitched 'toy' was given, lasting in total 5 s, often immediately followed by one or more repetitions of the five to seven climax 'toy' sounds. After play-back, a rather rhythmic four-note call was given: three 'toy' sounds on a rising scale followed by a high, piercing and vibrating 'seeet'. This call was usually repeated every 1.2 s (LNS 33022). Descriptions of this species's vocalisations can also be found in Coomans de Ruiter (1950).

**GREAT EARED NIGHTJAR** *Eurostopodus macrotis* On 30 July, just after dawn, at 1,750 m in the upper Sopus river valley, this large nightjar were seen flying over the forest. Watling mentioned 1,100 m as maximum elevation for this species.

**SULAWESI KINGFISHER** *Ceyx fallax* On 29 August, on the banks of the Saluki river near the Maleo nesting ground, a pair of this species showed alarm behaviour, suggesting the presence of a nesting site. The call was typical for the genus, a thin 'seeet' repeated every 3 to 5 s (LNS 33100).

**GREEN WOOD-KINGFISHER** *Halcyon (Actenoides) monachus* On 29 August, at Saluki, long mournful calls of this species, repeated about every 6 s, were recorded at 05h30 (dawn) (identified by F. Rozendaal). The 'huuuuEEEEu' call, also given after play-back, was of 2 s duration, starting with a slowly rising 1.5 s 'huuuu', immediately followed, with a catch in the voice, by a mournful, higher pitched 'wEEEEu' (0.5 s), and ending with a shortish subdued lower note (LNS 33099). The bird was present in forest near a palm grove bordering the Saluki river.

**SACRED KINGFISHER** *Halcyon sancta* On 19 July, one individual of this southern migrant was present in the centre of Palu. This species was not seen by Watling, although previously recorded from the Palu valley (Escott and Holmes 1980).

**BLUE-TAILED BEE-EATER** *Merops philippinus* On 9 and 10 August, at Anca, a family of two adults and a juvenile bird were seen on a bamboo in an open field, possibly indicating a breeding period in June-July (LNS 32950, 32952, 32963).

**PURPLE-BEARDED BEE-EATER** *Meropogon forsteni* On six occasions, above Sidaonta, in the lower and upper Sopus river valleys and above Anaso (at 2,300 m), pairs of this species were observed in the mid-height of forest near earth banks of excavated hill-side forest-trails or in steep ravines near roads (e.g. at km post 72 before Dongi-dongi). On 27 July and 20 August, at Anaso, sound-recordings were made of the species's queer, frequently given call (one per 2 s), a peculiarly loud, penetrating and high-pitched 'wheep' (LNS 32878, 32880, 33025). When calling, the birds sat inconspicuously on horizontal branches while constantly wagging the tail slowly up and down. Regularly, large insects were caught in short flights, and beaten to death on a thick branch before being swallowed. On 11 August, above Sidaonta, a nesting hole was apparently being excavated in a bank at a height of 1 m just beside the footpath to Lake Lindu. For more information on this species, see Klapste (1982a).

**PURPLE-WINGED ROLLER** *Coracias temminckii* Seen at somewhat higher elevations than by Watling, e.g. above Dongi-dongi at 1,000 m (LNS 32809).

**SULAWESI WOODPECKER** *Picoides temminckii* Watling regarded this species as relatively uncommon and observed it only above 900 m. However, after becoming familiar with its call, we found it a common tree-top species at all elevations down to 300 m near Saluwa. Its call was a sharp trill lasting 1 s, slightly inflected downwards halfway, given at long irregular intervals (LNS 32858, 33065). A description of this sound was also given by Coomans de Ruiter and Maurenbrecher (1948) who observed this species at sea-level in southern Sulawesi.

**GREY WAGTAIL** *Motacilla cinerea* On 21 August, in upper Sopus river valley, one individual was seen and sound-recorded (LNS 33035). This date is three to four weeks earlier than the first arrival date given by Watling for this northern migrant.

**PYGMY CUCKOO-SHRIKE** *Coracina abbotti* This species appeared to be rather common on Mt. Rorekatimbu. It was quite vocal and generally seen in groups of about five birds (*contra* Watling). The calls were thin, piercing, high-pitched and pure-toned (LNS 32821, 32883). The song, recorded from a solitary bird, started with two hardly audible notes followed by a faster four-note warble lasting 1 s, of similar thin and piercing quality as the calls, though a little lower pitched (LNS 32889). Sharp, high 'tseet' flight-calls were also noted.

**MOUNTAIN TAILORBIRD** *Orthotomus cuculatus* On 30 July, in upper Sopus river valley, two adults of this species were feeding two juveniles (LNS 32906).

**LITTLE PIED FLYCATCHER** *Ficedula westermanni* Owing to its characteristic song, this species was noted as common between 1,300 and 2,400 m elevation, most often in the canopy (*contra* Watling). On 25 July, two adults with two apparently recently fledged juveniles were seen in the understorey of Moss Forest (LNS 32820). On 20 August, a male calling in alarm with food in its beak was observed near the top of Mt. Rorekatimbu above Anaso. The commonest song was a 'tee-

dEE-turr-dUrr' lasting 1 s with a typical hesitant pause between the two disyllables (LNS 32800, 32893, 33040). Also a more complicated song lasting 2 s was recorded, in which similar 'tee-dEE' notes were followed by a warble of six to eight notes (LNS 32907). On play-back, the latter song provoked a much stronger approach reaction than the former.

**BLUE-FRONTED FLYCATCHER** *Cyornis hoevelli* The fine song of this Upper Montane and Moss Forest species was of 4–5 s duration, given from the lower storeys of forest and mainly heard in the morning and evening twilight. It started with a soft, short note followed by a rich and loud thrush-like sequence of c. 20 notes, closely matched in pitch (LNS 32822, 32824, 32879, 32887, 33032). On 28 July, on Mt. Rorekatimbu, a bird was seen in juvenile plumage, with black fringes to the body feathers giving it a scalloped appearance.

**ISLAND FLYCATCHER** *Eumyias panayensis* In forest and at forest edge above 1,000 m, this species appeared to be very common (*contra* Watling). It was seen in both lower storey and canopy, and was often present in mixed-species bird-flocks. The song, a clear rather monotonous warble lasting c. 5 s, consisted of a fast series of c. 20 notes, of a more liquid quality towards the end, reminiscent of Black-fronted White-eye *Zosterops atrifrons* (LNS 32782, 32797, 32913).

**CITRINE FLYCATCHER** *Culicicapa helianthea* The song of this species was always a combination of four or five loud, clear notes at different pitch, given in a variable order, lasting 1–1.5 s (LNS 32788, 32802, 32807, 32825, 32835). On 21 July, at Dongi-dongi, two adults were feeding two juveniles.

**STREAK-HEADED WHITE-EYE** *Lophozosterops squamiceps* Apparently partly frugivorous, as several birds on Mt. Rorekatimbu were seen eating berries.

**SCARLET MYZOMELA** *Myzomela sanguinolenta* A common and vocal species between 1,000 and 2,400 m, seen daily on Mt. Rorekatimbu in secondary growth and canopy. Among a variety of calls were: a loud and clear 'peeeew' repeated every 2 or 2.5 s, given while moving through the canopy (LNS 32847, 33024, 33036); a sharp disyllabic call 'treeu trEE', higher pitched in the second syllable, given every 10 s while perched in a tree-top (LNS 33031); a fast and liquid trisyllabic 'tuwEEdu' call lasting 0.5 s repeated every 2 or 3 s while foraging in *Loranthus* (LNS 32896); and a fast, shortish, thin and high-pitched warble delivered while perched on the bare branch of a tree-top (LNS 32895).

**STREAKED HONEYEATER** *Myza sarasinorum* This common montane species had a wide variety of calls, such as long series of short, sharp 'kep' notes, much resembling nervous scoldings of squirrels though less penetrating, endlessly repeated two (LNS 32828) to four times per second (LNS 32849, 32861, 32884, 33029); also a combination of three to five wheezy high-pitched notes in less than a second, usually given at long, irregular intervals by birds foraging in *Loranthus* (LNS 32847, 32881).

**INDONESIAN SERIN** *Serinus estherae* On 26 July, 16h00, at 2,400 m on Mt. Rorekatimbu, 'chip' contact-calls of two birds foraging in small tree-tops were sound-recorded (LNS 32848). Until recently, this species was only known from

highlands in Java and Sumatra (Indonesia) and Mindanao (Philippines). In August 1980, it was discovered on Mt. Rantekombola, south-western Sulawesi, in open habitat above 2,000 m (Schuchmann and Wolters 1982). In Central Sulawesi, Watling observed this species in Upper Montane Rain Forest at Rano Rano, Lore Lindu, in March 1981. As early as April 1979, he had a probable sighting on Mt. Rorekatimbu. Unfortunately, he did not give any details of plumage. Our birds, however, were distinctly different from those described by Schuchmann and Wolters, showing orange-red forehead and orange-red rump and uppertail-coverts, instead of yellow.

**SULAWESI MYNA** *Basilornis celebensis* On a few occasions, solitary immature birds were found associating with large flocks of Flame-browed Myna *Enodes erythrophris* feeding on berries in tree-tops (LNS 32912).

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