

may also be a causal factor in the increased elevational limits of at least six species observed at Bukit Fraser, Pahang, peninsular Malaysia in August 2003 (Rheindt 2004). Further monitoring is desirable to track any further changes in either elevational or range limits for this and other species within the region that might be related to regional or global climate change.

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Robert Hutchinson, c/o 26 Sutton Avenue, Chellaston, Derby DE73 1R7, U.K. Email: robhutchinson@birdtourasia.com  
Andy Mears, 34 Conygre Green, Timsbury, Bath BA2 07U, U.K.

## Observations of Cinnabar Hawk Owl *Ninox ios* in Gunung Ambang Nature Reserve, North Sulawesi, Indonesia, with a description of a secondary vocalisation

ROBERT HUTCHINSON, JAMES EATON and PHIL BENSTEAD

Cinnabar Hawk Owl *Ninox ios* was described as recently as 1999 on the basis of a single specimen collected in 1985 at 1,120 m in the eastern section of Bogani Nani Wartabone National Park, North Sulawesi (Rasmussen 1999). Subsequent published records involve an individual disturbed from its roost at 1,700 m in Lore Lindu National Park in December 1998 (Mauro 2001), a bird mist-netted at 1,420 m within the Gunung Ambang Nature Reserve in November 1999 (Lee and Riley 2001), a bird responding to tape-playback of the recently described call in September 2000 (King 2005) and a bird seen and heard at 1,250 m, again within Gunung Ambang Nature Reserve, in August 2001 (Trainor *et al.* 2006). This latter record involved only the second nocturnal observation of the species and the first description of a secondary vocalisation. Here we report another sighting of this species, describe nocturnal behaviour and produce sonagrams confirming the recently described secondary calls.

RH and JE visited Gunung Ambang Nature Reserve on 7–11 September 2004. On 8 September, they were birding at night in selectively logged primary forest at 1,290 m along the trail to Paya Swamp (00°46.295'N 124°23.442'E) when at c.21h00 they heard a series of unfamiliar owl calls. The calls appeared similar to the description they had been given by PB of vocalisations of a Cinnabar Hawk Owl he had heard and seen here on 24 August 2001, although PB was uncertain whether the call was territorial in nature or the begging call of a young bird or female. Such secondary calls are rarely given by most Asian *Ninox* owls (personal observations, König *et al.* 1999). After the description of the territorial call by King

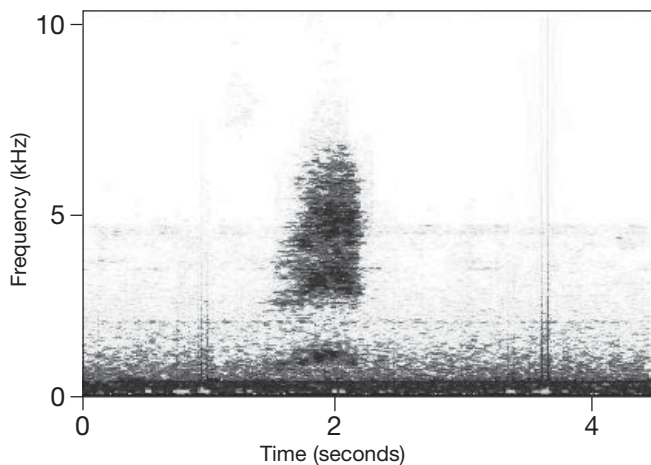
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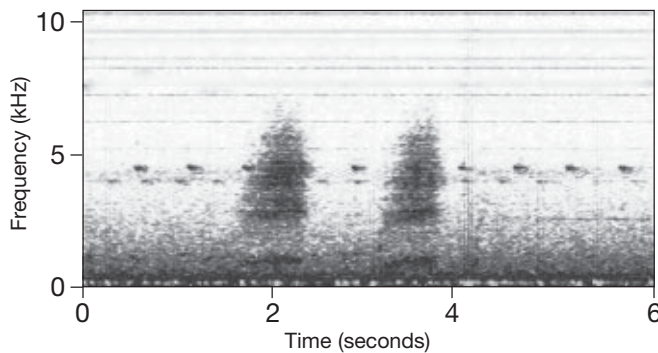
(2005), it became apparent that this call did indeed represent a secondary vocalisation.

Despite calling regularly, the bird proved rather elusive and was quite unresponsive to playback of recordings of its call. It was some time before the bird was finally located calling from exposed branches high in the canopy. Despite the initially rather distant views, the combination of predominantly chestnut plumage, lack of facial markings and yellow irides immediately suggested that it was indeed Cinnabar Hawk Owl. Fortunately, the bird then gave good views. It called frequently until c.01h00 hours when it became more elusive, called less frequently and was only seen on two more occasions prior to dawn. Closer views allowed us to note other key features, including: the lack of white markings in the wing-coverts and flight feathers, these being restricted to the scapulars; pale markings giving a dappled effect on the chestnut underparts; and the entirely pale bill and cere. The bird appeared short-tailed (with the wing-tips falling level with tail-tip) and rather compact in appearance. The bird was again present in the same small area on the evenings of 9 and 10 September and we were able to study it at length for c.3 hours in total. In addition, another bird was heard and recorded at 1,280 m, c.2 km away just after dusk on 9 September. Unfortunately this individual was fairly distant on a steep forested slope and was not seen, but the calls of the two birds seemed identical.

On 9 and 10 September, the bird began calling at c.17h50 (just prior to dusk) and foraged for c.10 minutes shortly after dusk in the same clearing, created by a recently felled tree, near the top of a moderately steep slope at a



**Figure 1.** Sonagram of single call note of Cinnabar Hawk Owl, Gunung Ambang Nature Reserve, Sulawesi, Indonesia, September 2004 (recordings by RH).



**Figure 2.** Sonagram of double call note of Cinnabar Hawk Owl, Gunung Ambang Nature Reserve, Sulawesi, Indonesia, September 2004 (recordings by RH).

height of c.5–10 m. Subsequently, the bird was only ever observed in the middle or upper canopy c.15–25 m above the ground, and generally called and fed from open, unobscured branches. It was frequently observed feeding, sallying out from open branches to catch flying insects before returning either to the same perch or one nearby. On at least three occasions when the bird was feeding high in the canopy it hovered for up to three seconds during sallies. These observations suggest that the species does indeed prey largely on flying insects as suggested by Rasmussen (1999), a hypothesis based on morphological similarities between Cinnabar Hawk Owl and owl-nightjars Aegothelidae.

The call, often given repeatedly for 1–2 hour periods, was superficially rather *Tyto*-like, consisting of a single dry, nasal, hissing shriek typically 0.5–0.7 seconds in duration, becoming louder and harsher before ending rather abruptly (Fig. 1). It was delivered rather irregularly, usually with 6–10 seconds between calls, although occasionally as little as 0.5–1.0 seconds (Fig. 2). In response to playback, the bird did not approach but it increased its rate of calling. After long periods of silence, the bird would often begin calling again in response to playback.

Sulawesi Owl *Tyto rosenbergi* produces calls of similar duration, but these are more explosive, higher-pitched and

distinctly harsher. Calls of Minahassa Owl *T. inexpectata* are also harsher, more nasal and longer in duration, typically lasting 1.8 seconds (Mauro and Drivers 2000). Although these calls appear not to be territorial in nature, they may be a useful way of locating birds, at least during the season that we made our observations. Further study is required to determine their function and whether they are given throughout the year. A copy of the sound recordings has been deposited at the British Library Sound Archive, London.

The species has so far only been recorded within protected areas, namely Bogani Nani Wartabone National Park and Gunung Ambang Nature Reserve in North Sulawesi, and Lore Lindu National Park in Central Sulawesi. All records have been between 1,120 m and 1,700 m, indicating that the species occupies higher elevations than the sympatric Ochre-bellied Hawk-owl *Ninox ochracea*, which seems to be restricted to the lowlands below 800 m (Rasmussen 1999). Although forest at higher elevations on Sulawesi is relatively intact at present (Lee and Riley 2001) and the species is likely to occur on other forested mountains on Sulawesi, Cinnabar Hawk Owl should continue to be treated as Vulnerable on the IUCN Red List owing to its restricted range (Birdlife International 2001). Now that its vocalisations have been described, it is hoped that surveys can be carried out to establish the true status and distribution of this enigmatic bird.

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Robert Hutchinson, c/o 26 Sutton Avenue, Chellaston, Derby DE73 6RĴ, U.K. Email: robhutchinson@birdtourasia.com  
 James Eaton, 17 Keats Avenue, Littleover, Derby DE23 4EE, U.K. Email: jameseaton@birdtourasia.com  
 Phil Benstead, The Old Stables, Church Street, Reepham, Norwich NR10 4ĴW, U.K. Email: phil.benst01@tesco.net