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New distributional information for the birds of Flores, Indonesia, including new localities for the Endangered Flores Scops Owl *Otus alfredi*

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SUMMARY.—The Indonesian island of Flores hosts a remarkable avifauna that is both highly endemic and highly threatened. Nevertheless, basic knowledge of these birds is incomplete. Here we present new distributional information for 18 of the island's bird species obtained during 2011; these include endemics such as Leaf Lorikeet *Trichoglossus weberi* and rarely recorded residents like Oriental Dwarf Kingfisher *Ceyx erithaca*. Our records of all Flores endemics are summarised, and we present new information on the habitat tolerance of two additional range-restricted species. Most significant is the discovery of the little-known and Endangered Flores Scops Owl *Otus alfredi* at three new localities in the hills of far-western Flores, more than doubling the known altitudinal range of this endemic, which was previously considered to be strictly montane. We report new information regarding the owl's habitat preferences, vocalisations and sympatric occurrence with the other two *Otus* scops owls on Flores.

Flores (08°S, 119–123°E; 13,500 km²) is a young volcanic island in the western Lesser Sundas of Indonesia, within the biogeographic region of Wallacea. Part of the Northern Nusa Tenggara Endemic Bird Area (Stattersfield *et al.* 1998), it hosts a large number of range-restricted bird species. Three occur only on Flores, with two others additionally occurring on the small nearby island of Rinca generally considered to be 'Flores endemics' as well. Flores has received a relatively large degree of attention from ornithologists (see White & Bruce 1986 and Mees 2006) compared to other islands in Wallacea. Observations prior to the late 20th century were reviewed by Coates & Bishop (1997) and Verhoeve & Holmes (1998). During the second half of the last century, the work of J. Verheijen and E. Schmutz, two priests resident on Flores, added considerably to our knowledge of the island's birds. Schmutz's contributions included the first specimens of Flores Monarch *Symposiachrus sacerdotum*. In the 1990s, two different two-month ornithological expeditions to Flores were made by British universities (Butchart *et al.* 1996, Pilgrim *et al.* 2000), while BirdLife International / PKA and WWF spent seven months surveying 17 forest blocks on the island (Trainor & Lesmana 2000, Trainor *et al.* 2000).

Despite this attention, much remains to be learned about the island's birds and basic distributional data are incomplete. This is particularly true in respect of altitudinal ranges, as recent workers and visiting birdwatchers have tended not to publish precise elevational information. However, such data are important for biogeographical studies and conservation efforts. In August–October 2011, AHR surveyed forest birds in western Flores to gather data for community structure studies. During this field work and related scouting trips, observations were made expanding the known ranges of 18 species on Flores. These records pertain primarily to altitudinal distributions, and include several rarely recorded, threatened and endemic taxa. In addition, we summarise all of our observations of the five Flores endemics. We also present data on the habitat tolerances of two Lesser Sundas

endemics for which our observations contrast with assessments by Butchart *et al.* (1996) and Pilgrim *et al.* (2000).

The most important records involve the Endangered Flores Scops Owl *Otus alfredi*, an enigmatic and poorly known endemic of western Flores that was only recently confirmed to be a valid species (Widodo *et al.* 1999). Following its collection by A. Everett in 1896 in the Todo Mountains of south-west Flores, this owl went unrecorded for nearly a century before being mist-netted at Danau Ranamese and Poco Mandasawu (both in the Ruteng Mountains) in 1994 (Widodo *et al.* 1999). Pilgrim *et al.* (2000) reported another field observation at Danau Ranamese in 1997, and Hutchinson *et al.* (2007) made the first confirmed recordings of its vocalisations there in 2005. It is now observed with some regularity at Danau Ranamese by visiting birdwatchers (Simay *et al.* 2009). In 2010, two were seen (and one photographed) at Cunca Lolos in Mbeliling Forest Reserve (BirdLife Denmark 2010). These records, the first outside the Todo and Ruteng Mountains, extended the owl's known range c.30 km west. During 2011 field work, it was recorded on several occasions at three new sites in western Flores, including two localities near Danau Sano Nggoang, and a new locality within Mbeliling Forest Reserve. These observations are described below; the implications of this new information with respect to the owl's ecology and conservation status are addressed in the Discussion.

Study area and methods

Field work was conducted by AHR in August–October 2011, with formal surveys in September–October; SR joined AHR on several scouting trips. These months coincide with the transition from the dry to wet season on Flores. The primary purpose was to obtain data on avian community structures in mature forest and degraded habitat mosaics. Detailed information regarding study site features and survey methodology are presented in Reeve *et al.* (2015). Five to seven days were spent surveying each of four 1 km² plots in far-western Flores; two in mature forest, and two in human-modified degraded areas containing rice paddies, scrub and planted fruit trees, as well as patches of native vegetation. The first mature forest plot (08°36'06"S 119°59'30"E; 720–880 m) was in Mbeliling Forest Reserve. This reserve contains a large tract of moist semi-evergreen forest, and is crucial for the conservation of the island's restricted-range bird species; all five Flores endemics occur. The second mature forest site (08°45'11"S, 119°59'26" E; 480–770 m) was just south of Sisok (or Sesok) Forest Reserve on the rugged slopes of the dormant Wai Sano volcano. The two degraded plots were adjacent to Galang (08°39'20"S, 120°02'13"E; 300–550 m) and Lamung villages (08°37'14"S, 119°59'21"E; 510–760 m). Opportunistic aural surveys were made after dark around the campsites in mature forest. Several noteworthy records were made at the crater lake Danau Sano Nggoang (08°42'S, 119°59'E; 660 m). Also visited were a number of sites frequented by birdwatchers, including Potawangka Road (or 'Nggorang Bowosie' in Pilgrim *et al.* 2000) and Puarlolo in far-western Flores, and Golo Lusang and Poco Ranaka in the highlands south of Ruteng (Simay *et al.* 2009). Important sites visited are shown in Fig. 1.

Selected species accounts

Here we present new distributional information for 18 bird species on Flores. Additional notes are included for all five of the Flores endemics, as well as for two Lesser Sundas endemics where our observations concerning habitat tolerance disagree with current assessments. Taxonomy and nomenclature follow Gill & Donsker (2015). Subspecies are given when known with certainty.

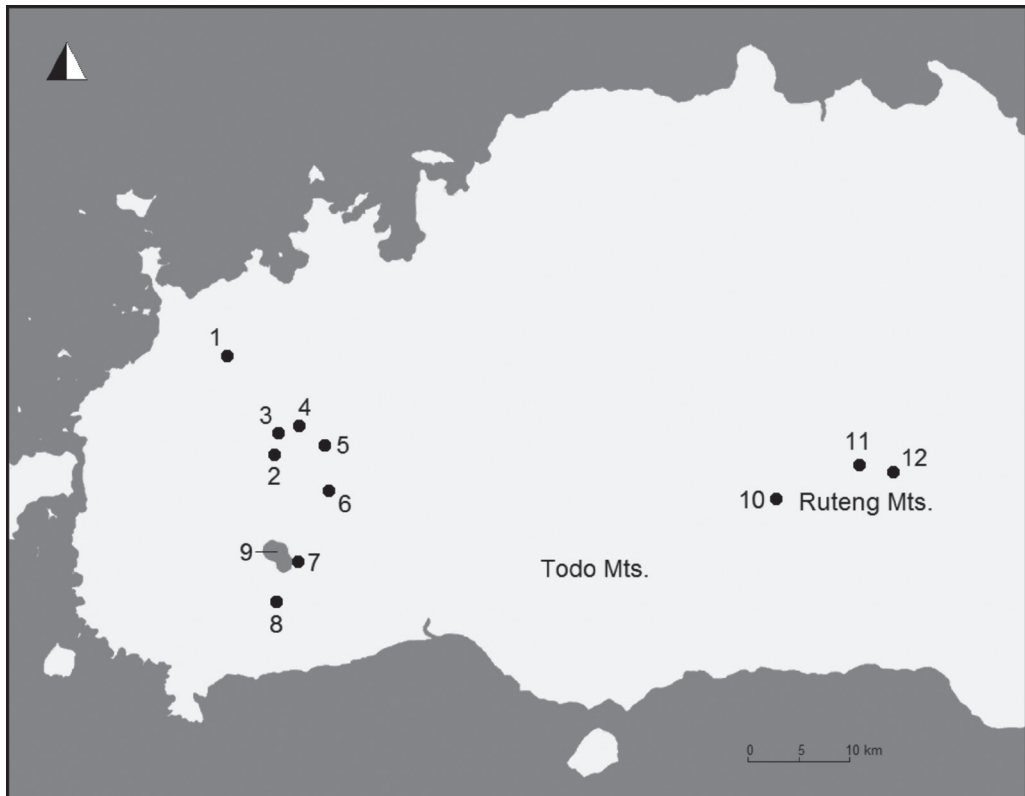


Figure 1. Map of western Flores showing important localities mentioned in the text. (1) Potawangka Road; (2) Lamung study plot; (3) Mbeliling Forest Reserve study plot; (4) Cunca Lolos; (5) Puarlolo; (6) Galang study plot; (7) Nunang; (8) Sisok forest study plot; (9) Danau Sano Nggoang; (10) Golo Lusang; (11) Poco Ranaka; and (12) Danau Ranamese.

CINNAMON BITTERN *Ixobrychus cinnamomeus*

Scarce on Flores, with just four records noted by Verhoeve & Holmes (1998). Mees (2006) identified eggs collected on Flores in 1955 as belonging to this species, establishing breeding. Coates & Bishop (1997) provided no information as to the species' altitudinal range on the island. Cinnamon Bittern was observed just once in 2011, when an adult was flushed from a flooded rice paddy in the Lamung study plot, at 520 m, on 6 October.

NANKEEN NIGHT HERON *Nycticorax caledonicus australasiae*

Rarely recorded on Flores, where birds are perhaps migrants from Australia (Coates & Bishop 1997, Verhoeve & Holmes 1998). An adult was observed resting on the south-east shore of Danau Sano Nggoang at 660 m in the evening of 1 September; probably the same individual was observed in the same place on 19 September. Coates & Bishop (1997) gave the upper altitudinal limit on Flores as 300 m, but Schmutz (1977) encountered the species at 'Nunang am See', which presumably refers to Danau Sano Nggoang, in 1969.

BARRED BUTTONQUAIL *Turnix suscitator powelli*

Coates & Bishop (1997) gave the upper altitudinal limit on Flores as 350 m. In 2011, it was observed only at the Galang study plot, with records at 350–500 m. Ten were seen there on

9–15 September. Other buttonquails encountered at this site were not seen well enough to discount Red-backed Buttonquail *T. maculosus*, which also occurs on Flores.

WHITE-WINGED TERN *Chlidonias leucopterus*

Primarily (or entirely) a passage migrant in Wallacea (Coates & Bishop 1997). First reported on Flores in 1996, and all of the island's records are from the sea or coast (Verhoeve & Holmes 1998). Single adult in non-breeding plumage on 1–2 September at 660 m, foraging along the south-east shore of Danau Sano Nggoang. Whiskered Tern *C. hybrida*, which in non-breeding plumage resembles White-winged Tern, was excluded based on the contrastingly dark outer primaries, dark tertial tips, a very faint line of black feathers connecting the eye with a dark ear-spot, and a relatively lightly streaked crown, without a distinct black nape collar.

METALLIC PIGEON *Columba vitiensis metallica*

Infrequently recorded on Flores in the past, but now observed regularly around Ruteng (J. Eaton pers. comm.) It has also been observed further west in Mbeliling forest and at Keli Mutu in central Flores (Verhoeve & Holmes 1998, Drijvers *et al.* 2000). The first and only record from Sisok was made on 24 September 2011, when a silent individual was seen perched in the canopy at 710 m in the study plot. Additional sight records were made at Mbeliling Forest Reserve study plot, with singles on 13–15 October. It was not heard calling at either site.

ISLAND COLLARED DOVE *Streptopelia bitorquata bitorquata*

Generally scarce and local in the Lesser Sundas (Coates & Bishop 1997, Schellekens *et al.* 2011), and Coates & Bishop (1997) provided no information concerning its altitudinal distribution on Flores. On 10, 12, 14 and 15 September, a total of 29 was recorded at 400–500 m in the Galang study plot, probably corresponding to at least 20 different individuals. The largest flocks contained six and 11 birds, respectively, but singles were also observed. Also noted in heavily degraded forest near the village of Werang (08°38'5"S, 120°00'3"E) at 330 m on 8 October. Observations by Schellekens *et al.* (2011) in mangroves south of Labuanbajo demonstrate that it occurs down to sea level on Flores, as on other islands in the Lesser Sundas (Coates & Bishop 1997).

BARRED CUCKOO-DOVE *Macropygia unchall unchall*

Coates & Bishop (1997) gave the lower altitudinal limit on Flores as 'c. 1,000 m'. Observed below 1,000 m in the Mbeliling Forest Reserve study plot on three dates, at 860–870 m. Probably the same individual was heard calling at dawn on 10, 12 and 14 October, and on the afternoon of 14th; visual confirmation was made on 12th. A second individual called simultaneously c.100 m distant on the morning of 14th.

BLACK-NAPED FRUIT DOVE *Ptilinopus melanospilus melanauchen*

Coates & Bishop (1997) stated that this species occurs no higher than 700 m on Flores, but a specimen was collected by Schmutz at 800 m near Nunang (Mees 2006). On 10–14 October, a total of seven was recorded at 750–880 m in the Mbeliling Forest Reserve study plot.

FLORES SCOPS OWL *Otus alfredi*

The first observation during the 2011 fieldwork was made in the village of Nunang (08°38'1"S, 120°00'1"E), at the edge of Sisok forest, near the south-east shore of Danau Sano Nggoang. SR had previously heard what he suspected was the species calling near the house

of a local villager involved with a BirdLife-coordinated ecotourism programme. On 1 September, at *c.*21.00 h, we played a recording by B. Demeulemeester at the edge of tall bamboo on a hillside near the house at *c.*700 m. Soon a bird responded with single call notes, which gradually became more frequent following further playback, and after a few minutes a second bird also began calling. Both continued calling vociferously in response to occasional playback. They remained hidden from view most of the time, but one was seen briefly by SR and the landowner on an exposed perch in the bamboo. We ceased playback after *c.*20 minutes and the birds stopped calling a few minutes later. AHR tried unsuccessfully to relocate the birds there on 19 September.

On 22–25 September, a Flores Scops Owl was heard calling each evening from a campsite within the remote Sisok forest study plot, 3.5 km south-west of Nunang, on a ridge at 590 m. The forest was undisturbed, but the trees on the ridgetop were relatively short, with low, tangled crowns. This bird did not respond noticeably to playback on 22 September; it continued calling at the same tempo and did not move closer. A short sound-recording was made (Fig. 2). The bird was not seen, despite its close proximity.

The final observations were made at the Mbeliling Forest Reserve study plot, in mature forest around a campsite at 870 m. This was *c.*2 km west of the 2010 observations at Cunca Lolos (BirdLife Denmark 2010) and 5 km west of Puarlolo, where R. Drijvers recorded calls possibly of Flores Scops Owl in 1998 (Hutchinson *et al.* 2007). Flores Scops Owls were heard calling at the Mbeliling site each night on 10–15 October 2011. Much of the night of 9–10 October was spent listening for birds and Flores Scops Owl called from around midnight to 02.00 h, and again at 03.00–03.30 h. On the following evenings, the species was generally heard for briefer periods shortly after dark, between 18.30 and 19.30 h. There was no discernible response to playback. No more than one bird was ever heard calling at any given time, and none was seen.

Virtually all vocalisations heard were consistent with the bursts of staccato notes identified as territorial calls by Hutchinson *et al.* (2007). However, on several occasions we noted a progressional pattern to these calls, which has not apparently previously been documented. Birds initially gave single staccato notes, separated by a few seconds. Gradually, these phrases grew in length (two, three, four notes, etc.), until reaching a phrase length in the range of 7–10 notes after 3–5 minutes. Whether all bouts of territorial calling followed this pattern was not clear; vocalising birds were sometimes first noticed giving calls with multiple-note phrases, but this could have been because the calls are not particularly conspicuous until multiple notes are given in succession. Bouts of territorial calling were often concluded with a single note, higher pitched and louder than the preceding ones, and perhaps given upon taking flight, and / or in alarm.

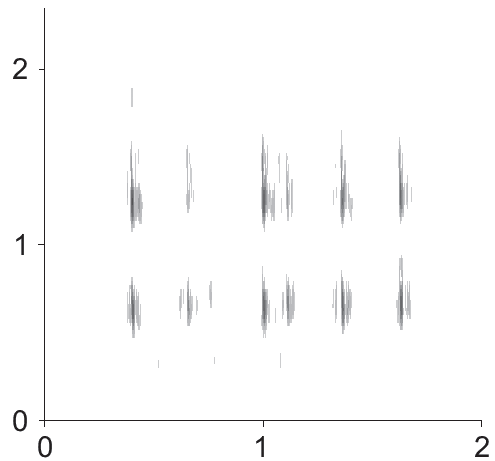


Figure 2. Sonogram of Flores Scops Owl *Otus alfredi* calls, recorded at 590 m in Sisok forest, Flores, on 22 September 2011. X-axis = time in seconds (1.0 seconds per tick), y-axis = frequency in kHz (1 kHz per tick).

ORIENTAL DWARF KINGFISHER *Ceyx erithaca motleyi*

The range of this South-East Asian species extends to the western Lesser Sundas as far east as Pantar (Trainor *et al.* 2012), but it is infrequently recorded from these islands (Coates & Bishop 1997, Verhoeye & Holmes 1998, Trainor *et al.* 2012). Verhoeye & Holmes (1998) reported just one record on Flores since the 19th century. Coates & Bishop (1997) stated that this species occurs no higher than '350+m' on Flores, but all three records in 2011 were above this altitude. On 1 September, a single was seen perched inside a small bamboo stand at the south-east shore of Danau Sano Nggoang at 660 m. The habitat there, bordering Nunang village, was highly degraded. On 28 September, a calling bird was seen at 390 m beside a river a few hundred metres downstream of Cunca Rami waterfall near Werang. It was in scrubby second growth, adjacent to a larger stand of intact forest. The final observation was made on 4 October at 600 m in mosaic habitat in the Lamung study plot. One bird was perched above a small, nearly dry streambed narrowly bordered by degraded forest.

Verhoeye & Holmes (1998) expressed concern for the conservation status of Oriental Dwarf Kingfisher on Flores, in light of its apparent rarity and large-scale destruction of lowland forest on the island. Our observations demonstrate that its altitudinal range on the island is wider than previously thought and indicate at least some tolerance of degraded habitat. We agree with Trainor *et al.* (2012) that it is probably frequently overlooked in the Lesser Sundas due to its inconspicuousness. Experience with the congeneric Variable Dwarf Kingfisher *C. lepidus* on the Moluccan islands of Buru and Seram (Reeve *et al.* 2014), and Obi (AHR pers. obs.) demonstrates that it is caught in mist-nets far more often than it is seen; mist-netting in appropriate habitat may therefore be preferable to audio-visual surveys to make accurate abundance estimates of *C. erithaca*.

RED-CHEEKED PARROT *Geoffroyus geoffroyi floresianus*

No previous records above 1,400 m on Flores (Coates & Bishop 1997), and it appears not to have been recorded higher than 1,440 m anywhere across its geographic range in Wallacea, New Guinea, and north-east Australia (Collar 1997, Reeve *et al.* 2014). It was seen twice above this on 9 August on the slopes of Poco Ranaka: a female perched in the canopy at 1,750 m, and another in silhouette as it flew overhead at 1,550 m. Also noteworthy was the observation, at Puarlolo (c.900 m) on 31 August, of an unusually large flock of 25–30 birds calling vociferously as they gradually made their way through the upper storey of the forest. Coates & Bishop (1997) gave max. flock size as ten.

LEAF LORIKEET *Trichoglossus weberi*

This Flores endemic has been split from the Rainbow Lorikeet *T. haematodus* species complex. Leaf Lorikeet was not previously known to occur above 1,400 m (Coates & Bishop 1997). On 8 August, two, followed shortly by a third, were seen flying overhead at Golo Lusang at 1,550 m. They perched out of sight, but were heard calling nearby. Further observations were made at three hill forest sites in far-western Flores. At the Lamung study plot, a total of eight flew overhead in pairs on the afternoons of 3–5 October, although it appears probable that they were travelling over without utilising the habitat at the site. It was fairly common at the Mbeliling Forest Reserve study plot, with a total of 19 (groups of 1–3) recorded during surveys on 10–16 October. The species was commonest along the eastern shore of Danau Sano Nggoang and in secondary forest around Nunang village, with observations during several visits in September. Surprisingly, however, it was not recorded in mature forest at the Sisok forest study plot, which is at approximately the same altitude and just 3–4 km from Nunang.

WALLACE'S HANGING PARROT *Loriculus flosculus*

A poorly known species endemic to Flores and nearby Rinca (Coates & Bishop 1997, Imansyah *et al.* 2008). Despite being familiar with its vocalisations, the only observation in 2011 was from Potawangka Road in far-western Flores, where it is already known to occur (Pilgrim *et al.* 2000, Simay *et al.* 2009). On 6 August, a group of three was observed close to the road, perched atop a 10-m tree that had shed most of its leaves and was not fruiting. The birds subsequently flew off, giving thin, high-pitched calls.

BROWN-CAPPED FANTAIL *Rhipidura diluta diluta*

This common species endemic to Flores, Lembata and Sumbawa has a broad altitudinal range from sea level to 2,140 m (Butchart *et al.* 1996). It occurs in a variety of forest habitats, with a well-documented tolerance for disturbed areas (Butchart *et al.* 1996, Verhoeve & Holmes 1998, Pilgrim *et al.* 2000). In 2011, it was one of the most abundant species in mature forest plots, but surprisingly was almost entirely absent from degraded mosaic plots at similar altitudes, with none recorded at Galang (9–15 September) and just one at Lamung (2–7 October). It seems this species may avoid fragmented forest interspersed with open areas, at least at these altitudes (300–760 m).

BLACK-NAPED MONARCH *Hypothymis azurea symmixta*

Coates & Bishop (1997) stated that this species reaches no higher than 700 m on Flores, but we recorded it regularly to 900 m. Records in 2011 included *c.*25 at 480–730 m in the Sisok forest study plot on 22–26 September, *c.*60 at 510–760 m in the Lamung study plot on 2–7 October, *c.*15 at 720–880 m in the Mbeliling Forest Reserve study plot on 10–16 October, and at least two at 900 m at Puarlolo on 31 August.

ASIAN PARADISE FLYCATCHER *Terpsiphone paradisi floris*

Not known to occur above 800 m on Flores (Coates & Bishop 1997). Approximately 20 were observed at 720–880 m in the Mbeliling Forest Reserve study plot on 10–16 October. Three (two males and a female) were recorded at 930 m at Puarlolo on 31 August; Trainor *et al.* (2000) previously noted the species' occurrence in the Puarlolo area, but gave no elevational details.

FLORES MONARCH *Symposiachrus sacerdotum*

This Endangered species is entirely restricted to the forests of far-western Flores at 300–1,000 m (Coates & Bishop 1997, Pilgrim *et al.* 2000). Recorded from three sites during the 2011 field work, all at or near known localities. Just three adults were recorded (*c.*500–700 m) during surveys in mature forest at the Sisok forest study plot (22–26 September); a fourth bird with an orange breast was probably a juvenile of this species, but was not seen sufficiently well to exclude Spectacled Monarch *S. trivirgatus* (*cf.* Butchart *et al.* 1996). It was ranked 18th (tied with 19th) in abundance of 25 species in the 1 km² plot. Flores Monarch was much more abundant in mature forest at the Mbeliling Forest Reserve study plot (720–880 m). During surveys on 10–16 October, 61 birds were counted: singles (*n* = 30), groups of two (*n* = 11) and trios (*n* = 3). It was the fifth most abundant of 37 species there. The species was also fairly common in tall secondary forest at Puarlolo on 30–31 August. Because the survey methodology used was designed to estimate relative rather than absolute abundances, it is impossible to make precise density estimates from these data. However, the results support the finding of Butchart *et al.* (1996) that Flores Monarch reaches its highest densities within a narrow belt of semi-evergreen rainforest at *c.*700–900 m.

FLORES CROW *Corvus florensis*

Endangered and endemic to western Flores and Rinca (BirdLife International 2015). On current knowledge, occurs at low densities in moist deciduous monsoon forest and semi-evergreen rainforest at 0–950 m, with some tolerance of degraded habitat (Butchart *et al.* 1996, Pilgrim *et al.* 2000). Our observations support this. Most records were made in the two study plots containing mature forest. In Sisok (480–770 m), 1–2 were noted daily on 22–26 September, including one that called in the same area on most mornings. In Mbeliling Forest Reserve (720–880 m), *c.* 2 were recorded daily on 10–16 October; on 12 October, a group of four was encountered, two of them being chased by a scolding male Asian Paradise Flycatcher. Flores Crow was encountered only twice in study plots containing degraded habitat mosaics: two at Galang on 15 September and one at Lamung on 4 October. Other records included two in secondary forest along Potawangka Road (6 August), 1–2 in secondary forest at Puarlolo (*c.* 900 m) on 30–31 August, a group of three at 660 m in trees along the north-east shore of Danau Sano Nggoang on 1 September, and one in secondary forest along the road from Werang to Bambor on 3 September.

BARN SWALLOW *Hirundo rustica*

This migrant regularly visits Wallacea during the boreal winter. Coates & Bishop (1997) gave its upper altitudinal limit in the Lesser Sundas as 400 m (on Lombok), but provided no information concerning its altitudinal distribution on Flores. Two were seen amongst a flock of Pacific Swallows *H. tahitica* over Danau Sano Nggoang at 660 m on 20 September.

PACIFIC SWALLOW *Hirundo tahitica javanica*

Coates & Bishop (1997) stated that the upper altitudinal limit on Flores is '350+m.' The species was observed on several dates at Danau Sano Nggoang (660 m): at least 100 were seen feeding on flying insects on 1, 2, 19, 20 and 27 September, mostly near the south-east shore. Schmutz (1977) previously recorded it at 'Nunang am See', which presumably refers to Danau Sano Nggoang.

ORIENTAL WHITE-EYE *Zosterops palpebrosus unicus*

Not known below 'c. 500 m' on Flores (Coates & Bishop 1997). Several observations were made at 400–500 m in the Galang study plot, including three on 11 September, two on 12 September and five on 14 September. Some of these records may refer to the same individuals. The similar-looking Lemon-bellied White-eye *Z. chloris* also occurs on Flores at these altitudes; identification of Oriental White-eye was based on the diagnostic bright yellow rump (visible as birds preened) and their calls (ascending trills).

SHORT-TAILED STARLING *Aplonis minor minor*

No previous records above 1,200 m on Flores (Coates & Bishop 1997). A total of five was seen at 1,500 m at Golo Lusang on 8 August; one disappeared into what appeared to be a nest hole in a tree.

GOLDEN-RUMPED FLOWERPECKER *Dicaeum annae*

Endemic to Flores and Sumbawa. Although Pilgrim *et al.* (2000) noted its wide habitat tolerance, Butchart *et al.* (1996) reported it to be reliant on primary semi-evergreen rainforest with little tolerance of habitat degradation, an evaluation echoed by Coates & Bishop (1997). In 2011, it was one of the most abundant species in mature forest plots, but large numbers were also recorded in degraded plots. In Galang, 31 were recorded (9–15 September) and it

was the 15th most numerous of 39 species encountered; in Lamung, 65 were recorded (2–7 October) and it was the seventh most numerous of 44 species.

SCALY-BREASTED MUNIA *Lonchura punctulata blasii*

Coates & Bishop (1997) gave the upper altitudinal limit of this common species as '1,000+m' on Flores. A flock of five, followed by another two, was seen at 1,500 m at Golo Lusang on 8 August.

Discussion

Our Flores Scops Owl records have positive implications for the conservation status of this Endangered species, as the new observations expand its known altitudinal range and habitat tolerances, and establish its presence in a new forest block in western Flores. It was previously known to occur only in montane moist semi-evergreen forest within a narrow elevational band at 1,050–1,400 m (Widodo *et al.* 1999). The 2011 records at Mbeliling Forest Reserve were made in habitat not markedly different from previously known sites. However, the new records at 590 m in Sisok were made in seasonally dry forest with a relatively large component of deciduous trees. Approximately 20% of the trees in the surrounding habitat (480–770 m) were deciduous and without leaves in September 2011. Observations there demonstrate that Flores Scops Owl can utilise habitat intermediate between the moist semi-evergreen forest of the Flores highlands and the seasonally dry monsoon forest at lower altitudes.

The two new localities in Sisok lie within a 'limited production forest', just outside the boundaries (to the north and south, respectively) of a formally protected reserve. We strongly suspect that the owl occurs within the reserve itself, as it contains similar habitat types at similar altitudes. As noted, the observations at Mbeliling were also made within a protected forest area. Also encouraging is the observation in degraded habitat at Nunang. Forest quality improves steadily south and east of the village, and the owls may be dependent on higher quality forest in their core territories. Nevertheless, this observation supports the suggestion by Hutchinson *et al.* (2007) that Flores Scops Owl can utilise degraded habitat if it is adjacent to better quality forest.

Our observations also shed fresh light upon the co-occurrence of Flores Scops Owl with the island's other scops owls, Moluccan Scops Owl *O. magicus* and Wallace's Scops Owl *O. silvicola*. As noted by Widodo *et al.* (1999) and Pilgrim *et al.* (2000), Wallace's Scops Owl occurs sympatrically with Flores Scops Owl. Wallace's Scops Owl was heard calling throughout the night of 9–10 October at Mbeliling Forest Reserve, often concurrently with Flores Scops Owl. However, Moluccan Scops Owl, which occurs at lower altitudes on Flores, has never been shown to co-occur with Flores Scops Owl. Some authors have speculated that interspecific competition with Moluccan Scops Owl has restricted Flores Scops Owl to altitudes above c.1,000 m (Collar *et al.* 2001, Hutchinson *et al.* 2007). Our observations refute this and demonstrate that the two species can occur sympatrically over at least 590–870 m. Moluccan Scops Owl was common and highly vocal at all three sites where *O. alfredi* was recorded, with the two species often calling simultaneously from nearby. Although virtually all birds went unseen, we observed nothing suggesting any direct interaction between the two species. All three scops owl species were heard calling within a 100 m radius at Mbeliling Forest Reserve on the night of 9–10 October.

Finally, it is worth discussing our observations in light of a recurrent problem regarding identification of Flores Scops Owl, namely a reported similarity of the owl's call to that of Red-legged Crake *Rallina fasciata* (Schmutz 1977, Coates & Bishop 1997, Hutchinson *et al.* 2007). We are not in doubt as to the identity of the birds we heard, as visual confirmation

was made on one date. Also, multiple recordings of both species have become available on the xeno-canto website, and differentiation is now fairly straightforward. However, it is odd that the owl has never previously been reported from Nunang, as this was the home of E. Schmutz, who spent considerable time observing birds in the area (Schmutz 1977). Perhaps Schmutz misattributed the owl's calls to the crane, resulting in it being overlooked.

The discovery that Flores Scops Owl occurs as low as 590 m significantly increases the size of its potential range in western Flores. Furthermore, the discovery of calling birds at three new sites (found more or less by chance) indicates that targeted searches would be worthwhile, and that the transition from the dry to the wet season may be a profitable period to undertake aural surveys. Such efforts are urgently required to clarify the distribution and abundance, habitat requirements, and ecology of this threatened owl.

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