The avifauna of Lambusango Forest Reserve, Buton Island, south-east Sulawesi, with additional sightings from southern Buton

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Lambusango Forest Reserve occupies a large area of south-central Buton, the largest attendant island of Sulawesi, Indonesia. Buton is located off Sulawesi's south-eastern peninsula and remains poorly known ornithologically. Bird surveys were undertaken in the reserve over eight eight-week long research seasons between June and August in 1999, 2001–2003, 2005, and 2008–2010. Variable radius circular-plot point counts were the primary census method, conducted as part of a long-term biodiversity monitoring programme in the reserve, although data were also collected from 840 mist-netting hours and approximately 2,560 hours of observational data. In total, 79 species were detected in the reserve, including 37 regional endemics (46.8% of the total avifaunal community) and four species considered by the IUCN to be globally threatened or Near Threatened. Additionally, a further 60 species (including two more Near Threatened species) were recorded in various habitats around southern Buton that were not detected in Lambusango Reserve, giving a total of 139 species records for the island. We believe that 51 of these species represent previously unpublished records for Buton. We present here a full account of our records from Lambusango Reserve and southern Buton, with additional details provided for threatened and Near Threatened species and new records of endemics.

INTRODUCTION

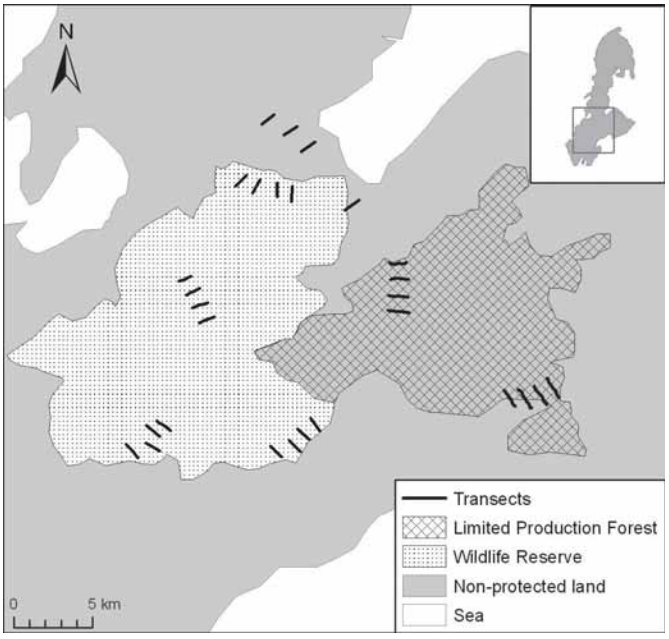
Buton (formerly referred to as Butung) is the largest of Sulawesi's attendant islands, located c.6 km (at the nearest point) off the mainland's south-eastern peninsula, between the Flores and Banda Seas. The island covers an area of c.560,000 ha and is around 100 km long and 42 km wide at its broadest point. Altitude varies from 0 to 200 m in coastal areas to around 400 m along the island's central spine, with isolated peaks reaching up to 1,000 m (O'Donovan 2001, Whitten *et al.* 2002). Precipitation follows a tropical monsoon climate with a June–September dry season and a November–April wet season. Mean annual rainfall ranges between 1,500 and 2,000 mm, peaking between April and June. Mean annual temperatures range between 25°C and 27°C (Whitten *et al.* 2002). The geology of the island is complex; much of the lowlands consist of uplifted karst and other limestone formations, while the mountainous interior is more varied, with sandstone, chert and ultramafic soils overlying ophiolitic rock. A large (70,000 ha) asphalt deposit, one of the most significant in South-East Asia, underlies a 60 km north–south strip of southern Buton (Whitten *et al.* 2002).

The natural vegetation cover of much of the island is seasonal lowland tropical forest, with mangroves occurring in coastal areas. No comprehensive survey of the island's flora has been completed but, as with mainland Sulawesi, the diversity of tree species is high, with no single family being predominant (O' Donovan 2001, Whitten *et al*. 2002). Extensive cultivation occurs in cleared areas in the lowlands, particularly in the south of the island. Major agricultural crops include rice, maize, sweet potatoes, cassava and plantations of cashew nuts, cocoa and coconut (Priston 2005). 'Alang-alang' *Imperata cylindrica* grassland and rough scrub occur in areas of abandoned cultivation. However, large tracts of relatively undisturbed forest remain in the island's interior. The island remains a stronghold for two species of Endangered endemic bovid: Lowland Anoa *Bubalus depressicornis* and Mountain Anoa *B. quarlesi*. This is one of only two locations where the ranges of both species are known to overlap, with approximately 10% of the global population of both species believed to occur on Buton (Burton *et al*. 2005). Despite their ecological importance, the forests of Buton have undergone significant clearance in recent years: agricultural expansion, logging and asphalt mining activities led to a reduction in the remaining forested area by over 13% (27,809 ha) between 1991 and 2002 (Seymour 2004).

Lambusango Forest Reserve (5°10′–5°24′S 122°43′–123°07′E) is a 65,000 ha expanse of uninhabited tropical monsoon forest, encompassing much of south-central Buton. The reserve was established in 1982 as part of a nationwide policy by the Suharto administration to found new national parks and reserves across Indonesia. Lambusango was selected as one of these new reserves based on its 'potency of flora and fauna'. Its area is divided into a 28,510 ha strict forest reserve, managed by the Indonesian Natural Resources Conservation Agency (BKSDA), where all commercial, recreational and agricultural activities are nominally prohibited, and a 35,000 ha production forest, regulated by Buton District Forestry Office, where some sustainable activity such as rattan extraction is allowed (Singer & Purwanto 2006) (Figure 1).

The avifauna of Buton remains poorly described. Several previous expeditions have taken specimens from the island, although few have involved any detailed survey work. The earliest account of the island's avifauna we can find comes from the

Figure 1. Lambusango Forest Reserve, showing locations of study transects. Inset shows the study area's location on Buton Island.



specimen collections of Heinrich Kühn, made at the turn of the twentieth century (Hartert 1903). Further specimens were collected on the island by G. L. den Haan in 1948 (van Bemmel & Voous 1951), and further species were added to the island's list by White & Bruce (1986), Schoorl (1987) and Coates & Bishop (1997). An extensive atlas survey of the island was completed by M. Catterall during 1996–1997. This was commissioned by the research organisation Operation Wallacea to provide an initial rapid assessment of Buton's avifauna. The findings were compiled as an internal report which was formerly available on Operation Wallacea's website but is no longer publicly accessible (Catterall undated, Operation Wallacea 2011).

METHODS

Records of Lambusango Reserve's avifauna were made in two ways: formal survey work; and informal observations and net captures. Formal surveys were carried out as part of the long-term biodiversity monitoring programme run by Operation Wallacea, and involved conducting 50 m-radius circular plot point counts (Bibby *et al*. 2002) along transects spread throughout the reserve. A total of 24 transects were used within the reserve, in six clusters of four transects each. Transects within each cluster were spaced 1 km apart. These transects were located between 100 and 700 m above sea-level and spanned a range of forest ecosystems and successional stages, including relatively undisturbed primary forest, well-regenerated secondary forest, disturbed secondary forest and forest-edge environments. An additional cluster of four transects was located in agricultural land around the reserve's periphery. Land-uses here included rice-paddies, coconut, cocoa, cassava and teak plantations, and recently abandoned land. Each transect contained seven sample sites at 150 m spacing, giving a total of 196 sample points. Each point was repeated once per season, giving a total of 1,568 individual point-counts over the eight research seasons.

Surveys were led by DJK and HAS during the 1999–2003 research seasons, HAS having several years' experience with the island's avifauna prior to this study period. Survey work in 2005 was led by HAS and TM, while surveys in the 2008–2010 seasons were led by TM and DH, who had several months' prior field experience with avifauna in Lambusango. Three or four Operation Wallacea volunteers would usually assist with survey work. Sampling was conducted each morning between 06h00 and 08h00. Point counts lasted 10 minutes, beginning on immediate arrival at each sampling site, with all birds seen and heard within the radius being recorded during this time. Point counts were not carried out in rain or heavy mist.

Informal observations were recorded whenever sightings were made outside the survey work. These included sightings made when travelling to and from survey sites and, on non-survey days, records made from casual exploration of a range of habitats inside the reserve and beyond its borders. Habitats explored in this way included all forest habitats described above, cultivated land, rough scrub, towns, rivers, mangroves and beaches, as well as the ocean passage between Buton and the Sulawesi mainland. Mist-netting was also conducted in these habitats on a casual basis whenever possible. Three 2.6 m × 20 m × 36 mm mesh mist-nets were used, which were checked every 20 minutes after opening. Netting was conducting in morning, afternoon and evening periods, with nets typically being closed around three hours after opening. A handful of records were also reported as by-catch from the mist-nets used by the bat survey team working in the same areas.

Once survey work was completed, species recorded in the reserve were tabulated, with the endemism and conservation status of each species being noted. Endemism levels were classified following Stattersfield *et al*. (1998) and Clements (2007). Sulawesi endemics were classified as those found only on mainland Sulawesi and its satellite islands, including the Talaud, Sangihe, Togian, Banggai, Sulu and Wakatobi (Tukangbesi) island groups (Coates & Bishop 1997). Wallacean endemics were classified as those found only in the Wallacea region, bordered by Wallace's Line in the west and Lydekker's Line in the east (Coates & Bishop 1997). National endemics were defined as those only occurring in Indonesia. Conservation status follows the 2010 IUCN Red List (IUCN 2010). Taxonomy follows Inskipp *et al*. (2001). Categorical abundance estimates for each species were based on frequency of sightings. The designated categories were: abundant (usually recorded multiple times each day in suitable habitat); common (usually recorded at least once per day); fairly common (typically recorded at least once per week); locally common (usually recorded daily, but restricted to specific habitats or spatially small areas); uncommon (recorded less than five or six times in a season); and rare (known only from one or two records). We identified species as being new records for the island if no records of their presence appeared in any of the published accounts of previous visitors (Hartert 1903, van Bemmel & Voous 1951, Schoorl 1987), regional field guides (White & Bruce 1986, Coates & Bishop 1997), comprehensive species checklists (Clements 2007), or international databases (BirdLife International 2010, IUCN 2010, Internet Bird Collection 2011).

RESULTS

Our total survey effort in the study area amounted to 2,560 hours of observational data (based on formal and informal survey work) and 840 mist-netting hours (based on the number of mist-nets used multiplied by the number of hours the nets were open). A total of 79 species was recorded in Lambusango Forest Reserve, of which 37 were endemic to Wallacea (46.8% of the total avifaunal community) and a further three were Indonesian endemics (3.9%). Four species considered globally threatened or Near Threatened (IUCN 2010) were detected in the reserve. An additional 60 species were recorded in various habitats around southern Buton that were not detected in Lambusango Reserve, including another eight Wallacean endemics, four Indonesian endemics, and two Near Threatened species. This gives a total of 139 species and 45 Wallacean endemics (30.9% of the total avifaunal community) recorded for southern Buton. The Appendix summarises species recorded by both formal and informal survey effort. The following annotated list provides further information concerning observations of globally threatened and Near Threatened species, and endemic species previously unrecorded on the island.

Grey-headed Fish Eagle *Ichthyophaga ichthyaetus*

A widespread species found in suitable habitat across much of South and South-East Asia. Considered Near Threatened (IUCN 2010) owing to habitat loss and over-fishing. A rare species in the study area; individuals were occasional sighted along river systems and over open farmland. This species has not been reported from Buton before and our records may represent an extension of its known distribution (del Hoyo *et al*. 1994).

Small Sparrowhawk *Accipiter nanus*

Endemic to Sulawesi and a few offshore islands. Considered Near Threatened (IUCN 2010). A rare species in the study area, known from two positively identified individuals: one that flew into a window in the coastal village of Kakenauwe in the 2010 season; and another mist-netted in Labundo-bundo village in 2009. These are interesting records as most previous publications have considered this a bird of upland forest (500–2,000 m) (White & Bruce 1987, Coates & Bishop 1997), while both our records come

from at or near sea-level. Catterall (undated) also recorded this species near sea-level during his atlas survey of the island. These are significant altitudinal records, and suggest that the species inhabits a wider range of habitats than previously thought. Our records represent an eastern range extension for this species, which has previously been reported only from mainland Sulawesi (del Hoyo *et al*. 1994, Coates & Bishop 1997).

Isabelline Bush-hen *Amaurornis isabellinus*
Endemic to Sulawesi and a few of its attendant islands. Fairly common in the study area. Individuals recorded regularly in cultivated land, particularly paddies and irrigation systems, as well as forest edge. Previously recorded from mainland Sulawesi.

Sulawesi Ground Dove *Gallicolumba tristigmata*
Endemic to Sulawesi. A shy and inconspicuous species that is difficult to observe. Known from a single live bird found captured in a snare in 2009. This individual showed noticeably different plumage from other descriptions, having extensive green coloration on the neck, which is absent in all subspecies described by Coates & Bishop (1997). A photograph of this bird was taken on a mobile phone camera but this was unfortunately lost at a later date. This record represents a range extension for the species, which was previously known only from mainland Sulawesi (Coates & Bishop 1997, del Hoyo *et al*. 1997, Whitten *et al*. 2002). Given the presence of other locally endemic subspecies on Buton and nearby Kabaena island (Robinson-Dean *et al*. 2002), the taxonomy of the population on Buton may be worthy of further investigation.

White-bellied Imperial Pigeon *Ducula forsteni*
Endemic to Sulawesi. Found almost exclusively in relatively undisturbed interior forest, where it is fairly common. Rare in forest edge and non-forest habitats. Usually encountered in small flocks of three to six birds, although much larger groups of up to 30 birds have been encountered around fruiting figs. Occasionally observed in mixed flocks with other imperial pigeon species. This species has previously been reported only from mainland Sulawesi and from Taliabu and Mangole in the Sulu Islands (Coates & Bishop 1997, del Hoyo *et al*. 1997).

Yellow-crested Cockatoo *Cacatua sulphurea*
Indonesian endemic. This species is listed as Critically Endangered owing to the threat posed by trapping for the pet trade, habitat destruction and population fragmentation. This species is rare in the study area. A single pair was observed each year between 2006 and 2009, flying between a stand of trees near coastal mangrove and the forest edge near Labundo-bundo. It is unknown whether these birds are truly wild or escaped cagebirds. This is the only Critically Endangered species in our study area. It has been previously reported as occurring on Buton (Coates & Bishop 1997).

Pygmy Hanging Parrot *Loriculus exilis*
Endemic to Sulawesi. Less common than Sulawesi Hanging Parrot *L. stigmatus*. More frequently observed in forest edge and adjacent cultivation than forest interior, where it is uncommon. Usually encountered singly or in pairs. This species has previously only been reported from mainland Sulawesi (Coates & Bishop 1997, del Hoyo *et al*. 1997).

Sulawesi Hawk Cuckoo *Hierococcyx crassirostris*
Sulawesi endemic. A common species frequently detected in forest and forest-edge habitats by its distinctive call, which is repeated at regular intervals throughout the night, early morning and occasionally later in the day, although it is extremely secretive and hard to observe. Previous records class this bird as an upland species occurring primarily between 500 and 1,400 m (Coates & Bishop 1997, del Hoyo *et al*. 1997). However, our records show it also occurs in lowland habitats, with many observations below 100 m. These new records from Buton represent a significant range extension for the species, which was previously known only from montane forest in northern and central Sulawesi (del Hoyo *et al*. 1997).

Black-billed Koel *Eudynamys melanorhyncha*
Endemic to Sulawesi. Apparently quite rare. Observed most frequently in the eastern side of the reserve, where flocks of up to six birds were recorded. Individuals were also encountered at locations scattered throughout the reserve. These records represent a range extension for the species, which was previously reported only from mainland Sulawesi (del Hoyo *et al*. 1997).

Sulawesi Owl *Tyto rosenbergii*
Endemic to Sulawesi. Rare and infrequently detected. Occasional records from edge habitats and around villages. One individual was captured in a mist-net in farmland near forest edge during the 2008 survey season. These observations represent a range extension for the species, which was previously known only from mainland Sulawesi and the Sangihe islands (del Hoyo *et al*. 1999).

Sulawesi Scops Owl *Otus manadensis*
Endemic to Sulawesi. The most frequently encountered owl in the study area. Fairly common in forest and forest-edge habitats and along roadsides, although it can be quite local. A single individual was also mist-netted in 2001. This species was previously known only from mainland Sulawesi (del Hoyo *et al*. 1999).

Sulawesi Nightjar *Caprimulgus celebensis*
Endemic to Sulawesi. Recorded infrequently, although probably under-recorded owing to insufficient surveying of nocturnal birds. This species was most often detected by voice in agricultural land and forest edge, with a few records coming from the forest interior. We believe this is a new record for Buton; it has previously been listed as 'probable' on Buton (del Hoyo *et al*. 1999).

Moluccan Swiftlet *Collocalia infuscata*
A Wallacean endemic occasionally seen flocking with other swiftlets over settlements and cultivated land. Previously known from mainland Sulawesi and the Moluccas (Coates & Bishop 1997).

Green-backed Kingfisher *Actenoides monachus*
Endemic to Sulawesi. A rare species known only from a single mist-net capture in the reserve's interior in 2005. This bird (subspecies *capucinus*) was netted along a river course at about 600 m altitude. This record represents a range extension for the species, which was previously known only from mainland Sulawesi (del Hoyo *et al*. 2001).

Sulawesi Dwarf Kingfisher *Ceyx fallax*
Endemic to Sulawesi. Considered Near Threatened (IUCN 2010). An uncommon species most frequently observed at night roosting in overhanging branches along forested river systems. Most individuals seem to utilise the same roosting spots each night. The species has previously been reported only from mainland Sulawesi and Lembeh Island (del Hoyo *et al*. 2001).

Pied Cuckooshrike *Coracina bicolor*
Endemic to Sulawesi. Listed as Near Threatened (IUCN 2010) owing to habitat degradation and fragmentation. A common species found throughout the reserve's interior and forest edge, and in places locally abundant. Rarely observed in non-forest habitats. Lambusango Reserve appears to support a large population of this species. Previously recorded as occurring on Buton (Coates & Bishop 1997).

Red-backed Thrush *Zoothera erythronota*
Endemic to Sulawesi. A cryptic and rarely observed understorey forest species. Known from several observations of lone individuals and pairs within the reserve's interior, and in forest-edge habitats. Previously known from mainland Sulawesi and Kabaena Island (Coates & Bishop 1997, Robinson-Dean *et al.* 2002).

Rufous-throated Flycatcher *Ficedula rufigula*
Endemic to Sulawesi. Considered Near Threatened (IUCN 2010). A shy, fairly cryptic species. It was rarely recorded during point-count surveys or casual observations but individuals were captured quite regularly in mist-nets in areas of mature and disturbed forest. Presumed to be severely under-recorded by our formal survey methods. The species has been previously reported only from mainland Sulawesi (Coates & Bishop 1997, del Hoyo *et al*. 2006).

Ivory-breasted Woodswallow *Artamus monachus*
Endemic to Sulawesi. Much less common than White-breasted Woodswallow *A. leucorynchus*, although still observed fairly frequently in similar habitats, particularly forest clearings. The species has been previously reported from mainland Sulawesi and the Lembeh, Banggai, and Sula island groups (Coates & Bishop 1997, del Hoyo *et al*. 2009).

Pale-headed Munia *Lonchura pallida*
Endemic to Wallacea. A rare species that has been very occasionally observed in paddyfields and other cultivated land. It has been widely reported from other parts of Sulawesi and the Lesser Sundas (Coates & Bishop 1997, del Hoyo *et al*. 2010).

DISCUSSION

We believe our survey work in Lambusango Reserve and its surrounds represents the most detailed account of Buton's avifauna in print, with 49 previously unpublished records for the island, each representing important range extensions of these species' known distributions. However, while these are new published records, it is important to acknowledge that the majority of these records were also identified by Catterall (undated), based on his atlas survey of the whole island. Only five of our new records were not reported in this earlier report (Slaty-legged Crake *Rallina eurizonoides*, Sulawesi Ground Dove, Sulawesi Nightjar, Rufous-throated Flycatcher and Scarlet Myzomela *Myzomela sanguinolenta*).

We also acknowledge that, while we have provided a detailed assessment of Lambusango Reserve and its immediate surrounds, the bulk of our survey effort has been focused on forest and forest-edge habitats. Further survey work on the island should concentrate on other habitats, such as agricultural areas, abandoned farmland, coastal areas and small offshore islands, as these could produce further unrecorded species. It may be, for example, that some of the small island species noted by Kelly & Marples (2010) in the nearby Wakatobi archipelago may also occur on Buton's numerous small offshore islets. It would also be valuable to conduct survey work outside the June–August research period used every year in this study, allowing the recording of wintering birds and passage migrants from Australia and the Palearctic. Further survey work targeting groups that were likely under-recorded by our point-count primary survey methods, such as nocturnal birds and cryptic, non-vocal species, may also produce further valuable records. Greater effort towards surveying of nocturnal birds and researching their habitat associations may represent particularly important future priorities, as the taxonomy and conservation status of nocturnal birds remains poorly understood in Wallacea, as it generally does in tropical island ecosystems globally (Sekercioglu 2010).

It is interesting to note, however, that some of our secondary survey methods, notably mist-netting, appear to be very limited in their effectiveness on Buton, and particularly within Lambusango forest. Despite spending on average just over 100 hours mist-netting in the forest interior each season, only around 10–15 birds were typically caught during this time: a very poor ratio of 6.6–10 netting hours for every capture. Capture rates were considerably greater in forest edge, villages and agricultural land—typically between six and nine birds per four-hour morning session in these habitats. Poor netting results in the forest interior could result from a dominance of canopy-level species in the Lambusango avifauna—53.2% of species detected within the reserve are described by Coates & Bishop (1997) as being associated mainly with canopy-level habitat strata—or from a low population density of understorey species that would be in a mist-net's effective capture range. A more complete study exploring the relative effectiveness of mist-nets compared to other survey methods in Lambusango Reserve is planned for the near future.

A final notable finding from survey work across Lambusango Reserve is the apparent adaptability of many endemic species to a wide range of forest habitats. While few Wallacean endemics were found in any abundance in cleared, non-forest habitats, only a small number of endemic species (most notably White-bellied Imperial Pigeon *Ducula forsteni*) were largely confined to undisturbed primary forest in the reserve's interior. Most endemic birds described in the literature as 'forest' species were encountered with similar frequency in primary, old growth secondary, and disturbed secondary forest, as well as forest-edge habitats. Indeed some endemic species, such as Sulawesi Pygmy Woodpecker *Dendrocopos temminckii* and White-rumped Cuckooshrike *Coracina leucopygia*, were encountered far more frequently in degraded forest habitats than primary or old secondary growth, and may be useful indicators of disturbed habitats. This has been discussed in detail previously (Martin & Blackburn 2010), and demonstrates the importance of secondary forests as important habitats for many of the region's range-restricted species, especially when these secondary forests are in close proximity to or contiguous with tracts of relatively undisturbed forest.

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Appendix

Checklist of bird species recorded in Lambusango Reserve and vicinity during 1999–2010 research seasons

Species marked in bold are those which we believe are new records for Buton Island, albeit previously recorded in Catterall (undated). Species in bold and marked # = new records; those marked * = Wallacean endemics, ‡ = endemic to Indonesia, † = assessed as threatened or Near Threatened by IUCN (2010). Abundance estimates are denoted as follows: A = abundant; C = common; F = fairly common; L = locally common; U = uncommon; R = rare. Species marked <M> are seasonal migrants to the study area. Species marked X in the final column have been recorded within Lambusango Reserve. All taxonomy follows Inskipp *et al*. (2001).

Common name	Scientific name	Abundance	Lambusango
Great Frigatebird	*Fregata minor*	U/R	
Lesser Frigatebird	*Fregata ariel*	C	
Little Pied Cormorant	*Phalacrocorax melanoleucos*	U	
Purple Heron	*Ardea purpurea*	F	
White-faced Heron	*Ardea novaehollandiae*	U <M?>	
Great Egret	*Casmerodius alba*	A	
Intermediate Egret	*Mesophoyx intermedia*	A	
Little Egret	*Egretta garzetta*	A	
Little Heron	*Butorides striatus*	C	
Pacific Reef Egret	*Egretta sacra*	U	
Cinnamon Bittern	*Ixobrychus cinnamomeus*	Fc	
Black Bittern	*Dupetor flavicollis*	U	
Woolly-necked Stork	*Ciconia episcopus*	F	
Osprey	*Pandion haliaetus*	F	
Jerdon's Baza	*Aviceda jerdoni*	R	
Barred Honey-buzzard	*Pernis celebensis*	F	X
Brahminy Kite	*Haliastur indus*	C	X
White-bellied Sea Eagle	*Haliaeetus leucogaster*	F	
†Grey-headed Fish Eagle	*Ichthyophaga ichthyaetus*	R	
*Sulawesi Serpent Eagle	*Spilornis rufipectus*	C	X
Spotted Harrier	*Circus assimilis*	L	
*Sulawesi Goshawk	*Accipiter griseiceps*	R	
†* Small Sparrowhawk	*Accipiter nanus*	R	
*Spot-tailed Sparrowhawk	*Accipiter trinotatus*	C	X
Black Eagle	*Ictinaetus malayensis*	F	X
Rufous-bellied Eagle	*Hieraaetus kienerii*	R	

Common name	Scientific name	Abundance	Lambusango
*Sulawesi Hawk Eagle	*Spizaetus lanceolatus*	F	X
‡ Spotted Kestrel	*Falco moluccensis*	L	
Oriental Hobby	*Falco severus*	U	
Wandering Whistling-duck	*Dendrocygna arcuata*	F	
‡ Sunda Teal	*Anas gibberifrons*	U	
Philippine Scrubfowl	*Megapodius cumingii*	U	X
Blue-breasted Quail	*Coturnix chinensis*	R	
Red Junglefowl	*Gallus gallus*	F	X
Barred Buttonquail	*Turnix suscitator*	R	X
#Slaty-legged Crake	*Rallina eurizonoides*	R	X
Buff-banded Rail	*Gallirallus philippensis*	F	
Barred Rail	*Gallirallus torquatus*	U	
***Isabelline Bush-hen**	*Amaurornis isabellinus*	F	
White-breasted Waterhen	*Amaurornis phoenicurus*	F	X
Common Moorhen	*Gallinula chloropus*	C	
Whimbrel	*Numenius phaeopus*	C <M>	
Common Sandpiper	*Actitis hypoleucos*	C <M>	
Red-necked Phalarope	*Phalaropus lobatus*	L <M>	
Bridled Tern	*Sterna anaethetus*	F	
Black-naped Tern	*Sterna sumatrana*	R	
Great Crested Tern	*Sterna bergii*	R	
Lesser Crested Tern	*Sterna bengalensis*	F	
Spotted Dove	*Streptopelia chinensis*	A	X
Brown Cuckoo Dove	*Macropygia amboinensis*	F	X
*White-faced Cuckoo Dove	*Turacoena manadensis*	F	X
Stephan's Dove	*Chalcophaps stephani*	R	X
#*Sulawesi Ground Dove	*Gallicolumba tristigmata*	R	X
Pink-necked Green Pigeon	*Treron vernans*	R	
‡Grey-cheeked Green Pigeon	*Treron griseicauda*	F	X
Black-naped Fruit Dove	*Ptilinopus melanospila*	C	X
***White-bellied Imperial Pigeon**	*Ducula forsteni*	F	X
Green Imperial Pigeon	*Ducula aenea*	A	X
Pied Imperial Pigeon	*Ducula bicolor*	L	
*Silver-tipped Imperial Pigeon	*Ducula luctuosa*	F	X
*Ornate Lorikeet	*Trichoglossus ornatus*	R	X
††Yellow-crested Cockatoo	*Cacatua sulphurea*	R	X
*Golden-mantled Racquet-tail	*Prioniturus platurus*	C	X
Azure-rumped Parrot	*Tanygnathus sumatranus*	F	X
* Sulawesi Hanging Parrot	*Loriculus stigmatus*	F	X
***Pygmy Hanging Parrot**	*Loriculus exilis*	U	X
***Sulawesi Hawk Cuckoo**	*Hierococcyx crassirostris*	C	X
Oriental Cuckoo	*Cuculus saturatus*	R <M>	
Plaintive Cuckoo	*Cacomantis merulinus*	U	X
Rusty-breasted Cuckoo	*Cacomantis sepulcralis*	U	X
Gould's Bronze Cuckoo	*Chrysococcx russatus*	R	
Drongo Cuckoo	*Surniculus lugubris*	C	X
***Black-billed Koel**	*Eudynamys melanorhyncha*	R	X
*Yellow-billed Malkoha	*Phaenicophaeus calyorhynchus*	F	X
*Bay Coucal	*Centropus celebensis*	C	X
Lesser Coucal	*Centropus bengalensis*	F	
***Sulawesi Owl**	*Tyto rosenbergii*	R	X
***Sulawesi Scops Owl**	*Otus manadensis*	C	X
Ochre-bellied Hawk Owl	*Ninox ochracea*	U	X
Great eared Nightjar	*Eurostopodus macrotis*	L?	
#*Sulawesi Nightjar	*Caprimulgus celebensis*	U?	X
Glossy Swiftlet	*Collocalia esculenta*	A	X
***Moluccan Swiftlet**	*Collocallia infuscata*	U	
Uniform Swiftlet	*Collocalia vanikorensis*	F	X
Grey-rumped Treeswift	*Hemiprocne longipennis*	A	X
***Green-backed Kingfisher**	*Actenoides monachus*	R	X
*Black-billed Kingfisher	*Halcyon melanorhyncha*	L	
Ruddy Kingfisher	*Halcyon coromanda*	U	X
Collared Kingfisher	*Todiramphus chloris*	A	X
Sacred Kingfisher	*Todiramphus sancta*	C <M>	
†*Sulawesi Dwarf Kingfisher	*Ceyx fallax*	U	X
Common Kingfisher	*Alcedo atthis*	F	X
Rainbow Bee-eater	*Merops ornatus*	L <M>	
*Purple-winged Roller	*Coracias temminckii*	F	X
*Sulawesi Hornbill	*Penelopides exarhatus*	F	X
*Knobbed Hornbill	*Aceros cassidix*	C	X
*Sulawesi Pygmy Woodpecker	*Dendrocopos temminckii*	R	
*Ashy Woodpecker	*Mulleripicus fulvus*	F	X
Red-bellied Pitta	*Pitta erythrogaster*	U	X
Barn Swallow	*Hirundo rustica*	C <M>	X
Pacific Swallow	*Hirundo tahitica*	C <M>	X
†*Pied Cuckooshrike	*Coracina bicolor*	C	X
*White-rumped Cuckooshrike	*Coracina leucopygia*	U/F	X
*Sulawesi Cicadabird	*Coracina morio*	C	X
*White-rumped Triller	*Lalage leucopygialis*	R	
‡White-shouldered Triller	*Lalage sueurii*	R	
Spangled Drongo	*Dicurus hottentottus*	A	X
Black-naped Oriole	*Oriolus chinensis*	A	X
Slender-billed Crow	*Corvus enca*	C	X
*Piping Crow	*Corvus typicus*	F	X
*Sulawesi Babbler	*Trichastoma celebense*	A	X
***Red-backed Thrush**	*Zoothera erythronota*	R	X
Pied Bushchat	*Saxicola caprata*	F	
Golden-bellied Gerygone	*Gerygone sulphurea*	C	
Zitting Cisticola	*Cisticola juncidis*	U	
Bright-headed Cisticola	*Cisticola exilis*	U	
#†*Rufous-throated Flycatcher	*Ficedula rufigula*	R/U	X
Black-naped Monarch	*Hypothymis azurea*	A	X
Citrine Canary Flycatcher	*Culicicapa helianthea*	A	X
White-breasted Woodswallow	*Artamus leucorynchus*	A	X
***Ivory-breasted Woodswallow**	*Artamus monarchus*	U	X
Asian Glossy Starling	*Aplonis panayensis*	A	X
*Sulawesi Myna	*Basilornis celebensis*	U	X
*White-necked Myna	*Streptocitta albicollis*	F	X
*Finch-billed Myna	*Scissirostrum dubium*	L	X
#Scarlet Myzomela	*Myzomela sanguinolenta*	U	
Brown-throated Sunbird	*Anthreptes malacensis*	F	X
Black Sunbird	*Nectarinia aspasia*	A	X
Olive-backed Sunbird	*Nectarinia jugularis*	A	X
Crimson Sunbird	*Aethopyga siparaja*	F	X
*Yellow-sided Flowerpecker	*Dicaeum aureolimbatum*	F	X
*Grey-sided Flowerpecker	*Dicaeum celebicum*	F	X
‡Lemon-bellied White-eye	*Zosterops chloris*	F	X
*Pale-bellied White-eye	*Zosterops consobrinorum*	C	X
Eurasian Tree Sparrow	*Passer montanus*	A	
‡Black-faced Munia	*Lonchura molucca*	C	
Scaly-breasted Munia	*Lonchura punctulata*	C	
Black-headed Munia	*Lonchura malacca*	F	
***Pale-headed Munia**	*Lonchura pallida*	R	